Thesis Title

Investigating the Strategic Approach to Cyberspace Culture and its Alignment with Vision 2030: The Case of Qatar Higher Education

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Abstract

The increased reliance on technology and the Internet represents a predominant feature of the modern business environment, whereby more enterprises are shifting their operations to online platforms in order to reduce operational costs, reach wider audiences, and leverage cyberspace technologies to achieve their strategic objectives. Likewise, in the higher education sector, universities and other higher education institutions are also adopting cyberspace technologies so as to achieve targeted strategic objectives. However, with the adoption of cyberspace, other unprecedented consequences emerge, such as cybercrime, cyber threats, cyber bullying, and cyber terrorism. Additionally, where the actions of actors in cyberspace are not well guided, this further results in the inefficient use of cyberspace technologies and their consequent misalignment with targeted strategic objectives. Subsequently, cyberspace culture emerges as a pivotal component for enabling the efficient use of cyberspace to achieve strategic objectives. The goal of the current research is to investigate the strategic approach to cyberspace culture and its alignment with Qatar's higher education vision for 2030. A key motivation for undertaking this research concerned the implementation of the Qatar National Vision, 2030 (QNV 2030), which seeks to transform the country's economy from hydrocarbon-based to knowledge-based by investing in science and technology and enhancing the higher education sector. As such, increased uptake and usage of technology is anticipated in the near future as the QNV 2030 is achieved. However, without proper guidance regarding the use of cyberspace technologies, the physical infrastructure is likely to deter achieving the higher education vision for 2030.

In the research, data were collected by conducting semi-structured interviews with 18 senior executives and by moderating a focus group comprising six managerial executives. The participants were drawn from Qatari regulatory organisations, higher education institutions, and the Ministry of Transport and Communication (MOTC). The findings indicated that, in order to align cyberspace culture with strategic objectives, effective frameworks are needed. However, current cyberspace culture frameworks were ineffective in aligning cyberspace culture to strategic objectives due to their failure to incorporate the impact of human factors. As a result, this research proposed a cyberspace culture framework to align strategic objectives in higher education. The framework comprised external elements (government's strategic directive on Vision 2030), internal elements (higher education management and leadership), and culture (human factors). The

proposed framework was validated by the focus group discussion and findings from previous literature, thereby indicating that it could be employed to align cyberspace culture with strategic objectives in different economic sectors aside from higher education. Nevertheless, the research further acknowledges that, in future scholarly work, there is a need for researchers to employ the model in a real-world setup so as to evaluate its effectiveness in aligning cyberspace culture with strategic objectives.

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Terminologies

Asynchronous communication:	Refers to a type of communication whereby users engaging in the interaction are not required to be present at the same time.
Chat/chatrooms:	Describes a place whereby any number of computer users can engage in live and online conversation and, as a result, share messages with each other and communicate in real time.
Cyber classrooms:	A place for teaching and learning over a network, wherein a teacher and students can speak to each other using microphone as well as by typing questions and answers in a message box. Many cyber classrooms have an electronic whiteboard for teachers to use for visual explanation.
Discussion board (Bulletin Board):	Describes a forum accessed over a network in which different messages can be placed.
Download:	Refers to the acquisition of information across a given computer network.
Emoticons:	Icons or symbols that represent people's emotional status, such as happy, humorous, sad, or surprised.
Elluminate:	A copyrighted web-conferencing software system allowing people to write and speak to each other in real time using a microphone and a headset. Elluminate also offers White Board for visual explanations.
Homepage:	Refers to the first page loaded whenever a user launches their web browser. As such, the webpage delineates an individual's personal page and the initial point for exploring the website.
Instant Messenger:	A computer application allowing instant text communication between more than two people through a shared network, such as the Internet.

Internet:	Refers to a system of interlinked computer networks in an international scope that facilitates data-communication services such as remote login, transfer of files, and electronic mail.
Invisibility:	A condition in which people are present to each other online, but are unable to see or be seen by each other
Listserv:	Refers to a programme that handles a mailing list allowing people to communicate with others who have subscribed to the same list.
Logging off, logging out:	An action whereby a password-protected session on a computer system is ended.
Logging in:	An act of provisioning both a username and password in order to gain access to a computer system. The action enables users to identify themselves in a given system. As a result, diverse users can store files separately and securely in one computer based on their distinct identities.
Newsgroups:	Describes a component of the Internet in which users are able to post and reply to messages sent by other users. An asynchronous text-based forum for communication.
Online:	Being Internet-connected. Online is employed as an adjective describing the variety of activities that can be undertaken on the Internet, such as shopping, chatting and playing games.
'rl':	A term derived from 'real life' during the period when 'virtual' and 'real' were termed as opposite. People today consider the virtual and cyberspace to be 'real', but the term 'rl' continues to be used to indicate space and events not in cyberspace.

Screen name: A name chosen by a user when engaging in synchronous communication on Instant Messenger. The name can either be the user's real name or a varied form of the person's real name, the person's nickname, a totally made-up pseudonym, or any series of characters.

Smiley: A sequential order of typed characters that produce the sideways image of an individual smiling, such as ':-)'. A smiley is used to represent emotion.

Synchronous communication: Any type of communication whereby parties who interact are required to be present simultaneously.

Abbreviations

ARPAnet	Advanced Research Projects Agency Network
CERN	Conseil Européen pour laRecherché Nucléaire
CERT	Computer Emergency Response Team
IBM	International Business Machines
ICT	Information and Communication Technology
ISF	Information Security Framework
ISCF	Information Security Culture Framework
IUS	Internet Utilisation Statistics
MIS	Management Information Systems
MIT	Massachusetts Institute of Technology
MOTC	Ministry of Transport and Communication
NCSS	National Cyber Security Strategy
QF	Qatar Foundation
QNV	Qatar's National Vision
RFID	Radio Frequency Identification
UNESCO	United Nations Educational, Scientific and Cultural Organisation
SME	Small and Medium Enterprises
SRI	Stanford Research Institute
UCLA	University of California, Los Angeles
VP	Vice President
WHO	World Health Organisation
WWW	World Wide Web

Chapter 1: Introduction

1.1 Background

The Internet has witnessed substantial growth over the past three decades, leading to the conceptualisation of a new communication dimension as a representation of cyberspace, considered the most significant achievement of modern man (Amant *et al.*, 2017). Gibson (1984) first coined the phrase 'cyberspace' in the novel *Neuromancer*, where the author viewed it as a graphical representation of data obtained from the memory banks of all computers present in the human system. As such, cyberspace can be explained as a new communication medium emerging from globally interconnected computers. Cyberspace can further be delineated as the virtual environment developed by computing systems and the users who interact within it (Schatz *et al.*, 2017). The Internet Utilisation Statistics (IUS) reported that the number of users has grown by 444.8% since 2000. Asia possesses the highest number of users (42%), followed by Europe (24.2%) and North America (13.54%). The rest of the users are distributed between Latin America/the Caribbean (10.4%), Africa (5.6%), and Oceania/Australia (1%; Gomez-Diago, 2012). Cyberspace culture comprises a pivotal aspect defining modern life as it empowers communities and individuals to organise and connect themselves in and through it (Boyle, 2017). The period between 2000 and 2010 witnessed an expansion in global Internet usage from 360 million to over 2 billion people. As this expansion of Internet usage continues, cyberspace culture is anticipated to continually grow and become interwoven in the daily life of individuals across the globe. Furthermore, given that a significant proportion of the population does not play any role in cyberspace, the advancement of wireless communication technologies is facilitating the emergence of interactive communication within horizontal networks. As a result, this enables different people to share synchronous and asynchronous messages through e-mails, chats, SMS, blogs, vlogs, podcasts, and wikis (Hunter, 2017).

For many years, women have occupied a significant portion of cyberspace at the behest of different motivations. For instance, in 2000, a study by the Pew Internet Institute revealed that women used cyberspace to maintain and establish relationships. In a separate study, Solis (2009) reported that platforms such as Facebook, Flickr, FriendFeed, myspace.com, and Twitter were utilised more by women than by men. As people enjoin themselves in networks, they access a wide range of available content on the Internet and can share both information and ideas concerning different

situations (Dohr *et al.*, 2010). Additionally, online access empowers individuals to complete diverse activities, such as shopping, completing online studies, or searching for jobs. These facilities further enable the human population to enjoy greater autonomy, in turn influencing their performance and empowering them to handle diverse issues. Women living in isolated regions can now also access opportunities and information they would be unable to access otherwise.

Cyberspace was recently defined as a world-changing domain characterised by the interlinked utilisation of the electromagnetic spectrum and electrons, the target of which is to construct, modify, exchange, use, share, save, and dispose of information and disrupt physical resources (Mayer *et al.*, 2014). Today, communication between humans is becoming increasingly computer-mediated and, over time, ubiquitous. Computers have become connected through high-speed networks both local and wide using wireless technologies. Interaction over high bandwidth is also boosting the speed of communication and offers the ability to transmit images, voices, and sound as well as data in a text format (Gungor *et al.*, 2011). Computer-based technologies are thus empowering the creation of entirely new interaction interfaces between humans and machines, along with a completely new virtual space for human–human interaction (Beck, 2014).

Collectively, these new and different communication spaces are referred to as cyberspace. Cyberspace comprises several elements: a) Telecommunications devices and physical infrastructures empowering the interconnection of networks of communication and technological systems; b) computerised systems and the associated software ensuring that domains operate and connect as required; c) networks linking computer systems together; d) networks that link the computer networks linking computer systems (the difference between (c) and (d) stems from the nature of organisation); e) access nodes for users and intermediaries that route nodes; and f) data residing in the systems (constituent data; Bryant, 2016; Smirnov, Levashova and Kashevnik, 2019).

A common school of thought posits that culture is associated with the past as well as the conservation and relaying of traditions in a particular community (Morin, 2016). However, a different cultural face is directed towards the future—namely, the forward-facing outlook of culture, comprising creation rather than a conservation of focus on memory and imagination. The

ability to discern new and unexpected scenarios to induct people into computer-mediated environments is required in the new environments they inhabit (Rouse and Dionisio, 2018). Nonetheless, despite the wide spread of computer systems, Rouse and Dionisio's understanding of functions as mediation tools remains relatively poor. Individuals can often feel disconnected in a technology-based world that appears strong and powerful in its physical presence while remaining hidden and difficult in another sense—namely, the understanding of the human experience they portray (Burda and Harding, 2013). Subsequently, understanding the present situation requires cultural imagination that involves speculating and affirming the likelihood of other forms of life that differ from the commonplace experiences to which users are accustomed in a natural manner as it shapes the mind through cultural transmission processes (Shweder *et al.*, 1998).

According to Gomez-Diago (2015), cyberspace culture embraces the set of attitudes, thought processes, values, and practices that grow together with cyberspace. By referencing the interaction between the different concepts, associations between culture and technology can be clearly identified. The lack of boundaries, whether nationally or locally in the environment, also encourages and enhances conversations between individuals drawn from diverse cultures (Gomez-Diago, 2012). Higher education cyberspace culture is delineated as an intellectual space culture to which users gain access via computers and which empowers users in the context of higher educational to collaborate with virtual reality, avatars, and text (Saunders *et al.*, 2009). In this cyberspace culture, educators and students are provided with a unique opportunity to undertake a wide range of computer-accessed learning, both planned and unplanned.

Avatars describe computer-based characters influenced by people in real life. In the past, several science-fiction writers highlighted that avatars enabled individuals to explore the imaginary world by using characters endowed with diversified features, ethics, and genders (Reamer, 2013). Furthermore, virtual reality also includes any forms of reality based on computers. Through cyberspace culture, students are empowered to engage in encounters that can be based on either fantasy or reality. Subsequently, examples of virtual reality include instantiations whereby the computer-mediated experience presumes a core defining feature of the environment, such as adventure games and computer-based flight simulators (Mahmoud and Auter, 2009).

Becker's (1994) study of teachers who deployed computers in an exemplary manner revealed that the school support for teachers, as well as the commensurate allocation of resources for the development of staff and smaller classes, heavily influenced the class learning environments where teachers were involved. Students' immersion in virtual reality was also anticipated to generate further diversified changes attributed to changes in culture. Internet believers from academia and industry today are deploying new technologies possessing all the features of culture, such as status, language, rituals, and symbols. In response, Bowers (1988) argued that computers behave as cultural devices, as they drive the philosophical viewpoints of the programmers and software designers who make them.

Lovink (2017) affirmed that not only is the Internet spread occurring rapidly, but there is also proof of an unplanned shift in culture. While some individuals inhabit a cultural space with features such as traditional text and conventional broadcast avenues, such as television, others instead engross themselves in cyberspace culture (Hanson, 2013). An argument by Postman (1985) postulated a diversion removed from conventional text and digitally produced typography images. In some instances, a variation of perspectives may occur between individuals who believe in the two types of culture (Snow, 1959). Snow postulated that scientists and literary intellectuals could not understand each other. Applying this analogy to higher education subsequently implies that it is likely that classrooms will emerge whereby teachers and students fail to differentiate the core principles of their counterpart's daily lives (Valimaa, 1998).

Cyberspace security and threats represent a concern for all stakeholders, not just the government, public authorities, commercial enterprises, or individuals (Caton, 2012). This research focusses on Qatar due to the country's overall objective of modernising its economy from being hydrocarbon-based to knowledge-based. In this context, investigating how to foster cyberspace culture in higher education will prove beneficial in the long term, as this will facilitate attaining the Qatar National Vision, 2030 (QNV 2030). A second justification for selecting Qatar is that the Researcher is able to easily collect data from senior executives in higher education and government regulatory bodies. Therefore, in order to transform Qatar into a highly advanced country by 2030, it will be necessary to provide information and communication technology (ICT) systems to empower government, private businesses, learning institutions, and individuals with access to the required knowledge

and information. To this end, in 2014, a new cybercrime law was enacted in Qatar to ensure protection against diverse cybercrimes and preserve intellectual property (Foody *et al.*, 2017). However, some arguments have been advanced against these new laws based on the possibility that this might prohibit freedom of expression. Likewise, numerous countries across the globe are facing similar challenges in enacting cyber laws that incriminate illegal activities in social media and cyberspace.

Nonetheless, Qatar has made substantial progress in developing an advanced ICT sector that will offer advantages for all sectors of society. The accessibility and affordability of ICT is also expected to enhance access to different societal aspects and empower collaboration across different levels. Qatar's establishment of the National Cyber Security Committee in 2013 further promised to furnish governance structures to enhance the collaborative addressing of cybersecurity at the highest government levels. As a result, Qatar formulated a National Cyber Security Strategy (NCSS) to serve as a blueprint for progressing and enhancing cybersecurity across the country. The NCSS coalesces diverse initiatives, measures, and awareness programmes on cybersecurity with effective governance, producing an efficient long-term protective strategy (Al-Jaber, 2014). Subsequently, this empowers Qatar in its efforts to achieve its vision by 2030.

1.2 Problem Statement

In order to achieve the QNV 2030, Qatar has been significantly investing in the acquisition of advanced technology and enhancing the use of ICT in all sectors of society, including higher education. This strategy aligns with the country's primary objective of transforming its economy from a hydrocarbon-based alternative to one that is knowledge-based. However, closer inspection of these strategic objectives reveals eminent problems that are yet to be addressed. To begin, as Qatar invests in the uptake of ICT technology in the higher education sector, an unprecedented consequence that is likely to arise concerns the lack of appropriate cyberspace culture to guide learners and teachers in using the technology to achieve established objectives. In this regard, higher education providers who advocate for students to adopt cyberspace culture possess a duty of care towards the students. In the event that students face risks due to the dangerous cyberspace environments, then serious questions regarding education quality must be asked. It thereby becomes possible that future use of educational cyberspace culture is likely to disadvantage

students. For this reason, it is necessary for effective cyberspace culture to guide learners in higher education so as to avoid misusing the technology and facing other threats. To this end, Vestich (1997) investigated the notion that educational technologies and the Internet are causing providers to stray from sound education practices. An argument has also been advanced that the Internet world can be viewed as a technology-constructed fabrication that serves as a substitute for reality.

Furthermore, while educational cyberspace culture is expected to provide diverse experiences, students and teachers should not expect the same level of satisfaction in online experiences and real life (Hope, 2016). Nonetheless, as revealed by Pugalee and Robinson (1998), the increased pace of equipping teachers with skills in computer-mediated technology, as well as for providing students with access to the Internet and educational cyberspace, will need to be utilised cautiously to prevent long-term results from disappointing such efforts. This also emphasises the second role of cyberspace culture—namely, guiding teachers to harness computer-mediated technology to achieve different strategic objectives. Taking this context into consideration, the research questions raised in this thesis concern how attaining Qatar's 2030 higher educational vision affects the cultivation of cyberspace culture. Therefore, the primary issue tackled in this research concerns the need for an effective cyberspace culture that can guide the actions of both learners and teachers in cyberspace in an effort to ensure they achieve targeted strategic objectives.

1.3 Rationale of the Research

Investigating the current strategic approach to cyberspace culture is crucial for combating or reducing the various threats facing Qatar's higher education sector. The evolution of modern cyberspace culture, particularly over the past three decades, has also become one of the most heavily researched topics today. In particular, considerable research has been conducted concerning higher education cyberspace in numerous countries, aided by technology and the rising interest in the cyberspace industry. However, there remains a lack of specific research on cyberspace culture in higher education in the context of Qatar in particular. To counter this, the scope of this current research goes beyond the use of academic research publications by including industry journals and case study surveys on the topic, whether private or public.

1.4 Research Aim

The primary goal of this research is to investigate the strategic approach to cyberspace culture and its alignment with Qatar's strategic direction, as well as to develop an effective framework for

aligning cyberspace culture with the vision of Qatar's strategic direction, supported by implementation guidance focussed primarily on the higher education sector.

1.5 Research Objectives

1. To evaluate current/existing cyberspace cultures' alignment with Qatar's strategic vision.
2. To identify the strengths and weaknesses of the various current frameworks regarding cyberspace culture.
3. To analyse the current strategic approach to cyberspace culture and its alignment with the country's strategic directions.
4. To analyse the QNV 2030 cyberspace strategy and how it is influenced by the attainment of the 2030 higher education vision.

1.6 Research Questions

1. How does cyberspace culture strategically align with the country's strategic directions?
2. How are current cyberspace culture frameworks aligned with the country's strategic directions?
3. Why is cyberspace culture important, and what literature gaps exist regarding cyberspace culture?
4. What kind of cyberspace strategy needs to be deployed by the government to align with the country's strategic directions?

1.7 Research Justification

Over the past three decades, significant research has been undertaken concerning the evolution of modern cyberspace culture given its undue influence on actors who inhabit the digital landscape. Research from organisations such as IUS has accordingly revealed that, over time, the number of cyberspace users has gradually increased in different parts of the world as technology has become more affordable and readily accessible. The higher education sector thus stands to benefit from the adoption of cyberspace and computer-mediated technology, as it facilitates not only learning, teaching, and content delivery, but also collaboration among researchers across different parts of the world. However, as higher education providers advocate for adopting cyberspace culture, increased risks remain for the various actors in the cyberspace environments, including cybercrime, cyberbullying, and cyberterrorism, among others. This necessitates serious debate regarding cyberspace culture's role in guiding the actions of students, teachers, and other actors in

cyberspace so as to minimise threats to the higher education sector and guarantee the success of computer-mediated technology in enhancing learning, teaching, and scientific research.

In Qatar's context, the goal of the human development pillar in the QNV 2030 is to enhance the human population's technical capacity through aspects such as investment in world-class scientific research and first-rate education to unlock said capacity. Furthermore, in enhancing the population's capacity, there has also been an increased focus on the delivery of e-education, whereby more investments are being made to deliver learning and teaching via technology. While such objectives will enable Qatari higher education institutions to achieve world-class education delivery, a further risk that is observed concerns the increased threat landscape that emerges from technology adoption. Therefore, to guarantee the success of investments in technological infrastructure for achieving the overall QNV 2030, a further need for cyberspace culture is emphasised to guide the actions of different actors, such as learners and educators, in the digital space.

The objectives of this research were to investigate the strategic approach to cyberspace culture and its alignment with Qatar's strategic direction in order to develop an effective framework for aligning cyberspace culture with the vision of Qatar's strategic direction, supported by implementation guidance focussed primarily on the higher education sector. This research thus responds to the need to foster positive cyberspace culture as technology-mediated learning becomes mainstream in the modern education environment. Furthermore, as the Qatar government depends on upskilling its population to drive a knowledge-based economy, there is an increased need to ensure that the adopted technology facilitates attaining the strategic goals and visions set by the government in the QNV 2030.

The Researcher is driven to pursue this research based on the importance of cyberspace culture for attaining the QNV 2030. In the current decade, Qatar has been investing in the delivery of higher education via technology (e-education). However, as such investments are being made across the various higher education institutions, an appropriate cyberspace culture to guide the actions of educators and learners in this digital space remains lacking. Therefore, the primary motivation for

undertaking this research stems from the disconnect between the attainment of the QNV 2030 and the existent cyberspace culture.

1.8 Research Contribution

1. This research seeks to investigate how cyberspace culture generally aligns with the strategic directions of a country. As such, it will enhance the implementation of new procedures and policies focussed on improving cyberspace-culture strategies. Moreover, this research will be crucial for easing the conceptual problem associated with cyberspace by helping to improve the present strategies for investigating information security.

2. The primary contribution of this research comprises a newly developed framework to facilitate the achievement of cyberspace culture (proposed cyberspace culture framework, Figure 4-7). This developed framework plays an important role as a reference point and a guide for other researchers in the same field. Additionally, it provides cyberspace scholars and professionals with practical recommendations concerning cyberspace's role and importance in higher education institutions. Additionally, this research also serves as a scholarly source for different fields in the services sector.

3. Through an in-depth analysis of various strategic frameworks, this research will prove valuable in contributing to the current theoretical knowledge by means of a thorough review of various academic sources, as well as industrial literature and sources.

4. This overall research will represent a substantial contribution to the advancement of knowledge in the field of cyberspace culture.

1.9 Research Methodology

The chosen research methodology provides a suitable structure for conducting research effectively. The guideline provided by the research methodology helps the researcher to follow the proper direction (Adams, Khan, and Raeside, 2014). According to Williams (2007), all tools and techniques necessary for data collection and analysis could be defined in the research methodology, representing an exploration of knowledge through objective and systematic methods for identifying solutions to research problems.

To satisfy the objectives of this research, qualitative research has been adopted as guided by an interpretive philosophy. As explained by Creswell (2011), qualitative research methods are most suitable for assessing and developing a comprehensive understanding of a phenomenon within its

natural setting. Qualitative research is based on an inductive process employed to formulate a hypothesis (Punch, 2006). This research adopts the inductive approach to theory development whereby empirical data are collected and analysed first in order to help develop patterns of theory. This is unlike deductive studies, which begin by hypothesising predictive statements, which are then tested by collecting empirical data. According to Walliman (2017), inductive reasoning starts from specific observations or sensory experiences, from which a general conclusion is developed.

Regarding the research strategy, a case study approach is adopted here, as this research focusses on one single geographical context—Qatar's higher education. Mabry defined a case study as 'the empirical investigation of a specified or bounded phenomenon' (Mabry, 2008, p., 214). Adopting a case study is thus justified by the fact that its use aids in discovering and understanding participants' experiences and perspectives within their specific operation environment. This, in turn, allows the Researcher to understand participant voices regarding the cultivation of cyberspace culture.

Sampling also represents an important aspect of the research methodology, as this outlines the approach guiding participant selection. Participants for this research were identified using a non-random, non-probability sampling technique whereby participants were chosen based on a pre-determined criterion. In particular, for the final research sample, the Researcher only targeted cyberspace experts and professionals as well as policy experts who understand the 2030 flagship project due to their research area knowledge (Silverman, 2016). With the non-probability sampling technique, a random selection method is not necessary to select a sample from the population. Rather, subjective methods are employed to decide which component will be part of the sample (Etikan *et al.*, 2016). Probability sampling is not adopted here because it assigns an equal probability of selecting participants in a given population (Fink, 1995).

With the participants selected, the Researcher proceeded to collect the qualitative data by administering interviews and moderating focus groups, as they facilitate investigating participants' views at greater depth (Dornyei, 2007; Kvale and Brinkmann, 2009). Cohen *et al.* (2007) also argued that interviewing represents a beneficial method for exploring the construction and negotiation of meaning in a natural setting. The Researcher conducted the different interviews on

a one-on-one personal basis in Qatar based on the convenience of the respondents and the Researcher. Due to data-saturation concerns, the Researcher limited the interviews to 15 participants and focus groups to 10 members, wherein each focus group would be assigned only five participants. Similar themes were maintained in the questions presented to interviewees and focus groups so as to ensure data reliability. Furthermore, the Researcher ensured that questions were unambiguous and free of any bias by using clear and easy-to-understand language. Likewise, bias was eliminated by structuring the interview questions based on the conceptual framework developed in the research and presenting them to a test group to ensure they understood everything clearly. Following the data collection, data analysis was performed via a thematic analysis of the content. Content analysis was employed to analyse the data whereby the collected data were categorised into themes and sub-themes, and comparisons were made.

1.10 Research Limitations

This research nonetheless remains limited by several issues: First, since the qualitative data were collected by conducting interviews with diverse players involved in formulating the QNV 2030, there remains a likelihood that they might not be available to partake in the interviews. Second, since the data collected from interviews were analysed using thematic content analysis procedures, there is a likelihood that the analytical approach might not generate the targeted data, particularly where the data remain too complex to analyse. Third, a challenge is also anticipated in obtaining information on cyberspace culture from a strategy rather than a technical perspective. The Researcher sought to interview senior executives drawn from higher education institutions and the QNV 2030 committee, as well as to engage in discussions with the various groups. As such, due to the respondents' highly technical roles, a challenge is likely to be encountered in that the respondents might only provide data from a technical rather than strategic perspective.

1.11 Thesis Outline

DESK RESEARCH
- Chapter 1: Introduction
- Chapter, 2: Literature Review
- Chapter 3: Gap in literature on Existing Cyberspace Frameworks
- Chapter 4: Development of Framework
- Chapter 5: Research Methodology

FIELD RESEARCH
- Chapter 6: Collection and Analysis of qualitative data
- Chapter 7: Collection and Analysis of quantitative Data
- Chapter 8: Discussion
- Chapter 9: Conclusion and Recommendations

Figure 1-1: Research outline.

Source: The Researcher

Chapter 2: Literature Review

2.1 Introduction

The cyberspace culture concept can be considered relatively new based on the fact that most academic research on cyberspace culture and related aspects has been published within the last three decades (Berman, 1999; Macfadyen, 2006; Bell, 2009; Murray and Murray, 2017). As such, the present chapter focusses on work published from the mid-1990s to the present. Furthermore, interest in cyberspace culture has progressively surpassed academic research in recent years, leading to the increased availability of data from other non-academic sources, such as the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (Diki-Kidiri, 2007). For this reason, the scope of this research considers not only academic resources, but also online articles, surveys, journals, and case studies describing this topic. The central purpose pursued in this chapter is to evaluate key contributions from cyberspace culture literature made by both scholarly and industrial researchers and higher education institutions in Qatar. To this end, the following areas are discussed:

- The evolution of the cyberspace environment and cyberspace culture over the last three decades;
- The most vital literature on cyberspace culture, basing the review on the higher education sector; and
- The value added, challenges experienced, advancements made, and oversight of the cyberspace culture.

The analysis of previous academic and industrial works on the cyberspace industry and the higher education sector revealed challenges, limitations, and advancements made in both areas, thereby enhancing the research. The analysis also furthers the research by opening up opportunities for development of the same nature or other related fields.

2.2 The Evolution of Cyberspace, Culture, and Core Advancements

This section seeks to introduce the underlying concepts employed throughout the chapter. To this end, this section has been further structured into six sub-sections so as to logically analyse the different concepts in a coherent manner. The first sub-section expounds on cyberspace history, ranging from its limited application during World War II to its wide-scale usage in the late 1980s

and 1990s as the Internet and personal computers became more affordable and assumed a central role in both business and personal lifestyles. The second sub-section discusses the concept of cybersecurity and how it emerged following the need to protect legitimate users from threats and destructive attacks from other malicious users. In particular, it emphasises the lack of international laws governing the Internet as a contributing factor to the observed rise in cybercrime.

The third sub-section undertakes a critical review of diverse definitions of cyberspace from different authors. By examining these definitions, the goal is to highlight similarities and differences among them and to further illustrate how the concept has evolved over time. For instance, certain research questions ask whether any changes have occurred in the underlying concept as definitions have progressed from works of fiction, such as cyberpunk novels, to more factual and non-fiction scientific applications. The fourth sub-section defines culture and its constituent elements, whereas the fifth sub-section delves further into the concept of cyberspace culture, its impact, and underlying concepts. The final sub-section discusses the concept of modern-day cyberspace culture and how it has been morphed by diversity in technological innovations.

2.2.1 Cyberspace History

The phrase 'cyberspace' was coined in 1982 by a Canadian science fiction author, William Gibson, in an article that appeared in the Omni magazine, and thereafter in his novel *Neuromancer* (Jahshan, 2007). In his definition, Gibson conceptualised cyberspace as a virtual world created by computer networks and inhabited by intelligent beings. An excerpt from Gibson's novel describing cyberspace delineated the concept as 'a graphic representation of data abstracted from the banks of every computer in the human system' (Gibson, 1984 p.51). As such, the author advanced the idea of a space in the digital realm that could be inhabited and explored.

Examining the root definition of the term 'cyberspace' further reveals a similarity in concept to the connotation made by Gibson. According to Berdayes and Murphy (2000), cyberspace is constructed of two root words: 'cyber' and 'space'. Cyber derives from the Greek word for 'pilot', thereby advancing the idea of steering, controlling, or piloting. Space, meanwhile, appears in the English language with diverse meanings, such as a time lapse or duration or a physical expanse (Van Manen and Adams, 2009). A philosophical view of space by Hobbes connoted the idea of an

unbounded continuum void of matter (Berdayes and Murphy, 2000). Therefore, cyberspace communicates the idea of control and unboundedness, or concretion and abstraction. Gibson shared the same view by conceptualising cyberspace as an imaginary space in the digital landscape where intelligent beings are free to explore and engage creatively.

Based on this understanding, it can be argued that the conceptualisation of cyberspace can be traced back to the early WWII period, when allies were investigating how electronic technology could be employed to improve radar signals and developing machines that could compute complicated radar messages (Kaisler, 2016). While computers were not yet fully developed during this era, a different school of thought argues that there existed computing devices that created virtual platforms where allies could engage with one another. Axelord (2014) further highlighted that technological disruptions have been catalysing cyberspace since their inception during the WWII period. A particular disruption concerned the creation of the Advanced Research Projects Agency network (ARPAnet) by the United States Department of Defence in the 1960s (Liu and Albitz, 2009).

The ARPAnet connected research organisations and government agencies in the U.S., allowing them to share scarce computing resources. By the mid-1970s, educational institutions and the government developed an interconnection of computers via networks to share information and messaging. For instance, the UCLA and the Stanford Research Institute (SRI) were interconnected using the ARPAnet through packet-switching technology (Liu and Albitz, 2009). By the mid-1980s, the observed increase in network interconnectivity led to a technological gold rush and effectively brought about the creation of new fortunes and the unprecedented demise of older regimes; a new economy thus began to be developed by enthusiastic engineers and venture capitalists, leading to the creation of a new venture in the Information Super Highway (Brown, 2014).

In 1990, a new innovation was developed by Tim Berners-Lee, a computer programmer working at the Conseil Européen pour laRecherché Nucléaire (CERN) in Switzerland. Lee created a system that could empower individuals in a network to access research materials (Brown, 2014). Similarly, they could also share documents across different computer platforms without necessarily having to reformat them. By 1991, Lee had created the first browser, later named the

World Wide Web (WWW; Brown, 2014). As such, the Internet boom experienced during the 1990s led to the development of a new system (cyberspace) and a culture associated with it (cyberspace culture).

2.2.2 Evolution of Cybersecurity

This sub-section provides a brief overview of terms employed to describe the evolution of cybersecurity. The history of cybersecurity is reviewed first, after which definitions of cybersecurity, cyberspace, and culture are provided. It is worth nothing that the Researcher first evaluates cybersecurity and its history. Thereafter, definitions for cybersecurity, cyberspace, and culture are provided and the official definition of cyberspace culture adopted in this research finally outlined.

2.2.2.1 History of Cybersecurity

The period between the 1970s and 1980s witnessed a substantial increase in computer usage across universities, colleges, and households (Forest and Kinser, 2003). Part of the reason for this came from the advent of the personal desktop computer during this time—namely, the IBM personal computer in 1981 and the Apple Macintosh in 1984. Second, computer networking developed rapidly with the conception of distributed computing by the Massachusetts Institute of Technology (MIT) and Carnegie Mellon University (Forest and Kinser, 2003). Such networks were integral for enabling students, staff, and faculty to share computing resources.

The direct implication of these two innovations was that they increased the number of users who could engage in cyberspace. Individuals who could access personal desktop computers could now easily share computing resources with others through digital networks. Nevertheless, this increased access to cyberspace also led to several disadvantages as well. In particular, given the lack of laws governing cyberspace, some individuals could use it for malicious intentions, such as by accessing unauthorised documents. Rost and Glass (2011) highlighted the case of Markus Hess, a German hacker who compromised over 400 military computers with the intention of selling secrets to the Russian KGB. However, his efforts were eventually stopped after being detected by Clifford Stall, a system administrator from the Lawrence Berkeley Laboratory (Stoll, 2005).

By the mid-1980s, cybercrime had grown from the basic access to unauthorised files to serious crimes comprising the spread of viruses and worms, producing significant destruction across the

Internet. Wang and Kissel (2015) noted the Morris worm developed by a hacker (Robert Morris) in 1988 as an experiment to assess the Internet's size. The worm was designed to traverse different computer networks, use a known bug to intercept Unix terminals, and duplicate itself. In essence, Morris intended the worm to infect as many computers on the Internet as possible without leaving a trace or causing harm to computers. However, the worm led to unprecedented effects, such as denial of services due to its rapid rate of spreading.

Following these actions, significant concerns were raised for ensuring the Internet's security. For instance, the Computer Emergency Response Team (CERT) was founded to research systemic issues that might generate adverse effects on the Internet (Lucas and Moeller, 2004). Similarly, legislations were also passed to convict individuals who misused computing resources, such as the 1986 Computer Fraud and Abuse Act. From this, cybersecurity emerged as a highly important concept for developing positive cyberspace culture.

2.2.2.2 Cybersecurity Definition

Cybersecurity can be described as consisting of controls, technologies, and processes designed to protect data, networks, and systems from cyber-attacks (Dorsey *et al.*, 2017). Lindsay (2015) highlighted that when cybersecurity is effective, it lowers the likelihood of cyber-attacks and further ensures that an organisation and its individuals remain protected from the threat of unauthorised exploitation of their technologies, systems, or networks (Lindsay, 2015). An effective cybersecurity approach comprises several protection layers spread across programmes, computers, networks, or data that a user intends to secure. In organisations, the technology, people, and processes ought to complement one another so as to develop effective defences against cyber-attacks (Altner and Servi, 2016).

Numerous definitions of the term 'cybersecurity' have emerged over the years, as summarised in Table 2-1 below:

Table 2-1: Definition of cybersecurity.

Year	Researcher	Cybersecurity definition	Significant features
2004	Moteff and Parfomak	'Cyber-security typically means protecting both physical and cyber assets from operational failure or manipulation due to unauthorised access to operating software or data'	Protection Importance of data

2009	Hansen and Nissenbaum	'protection against unwanted disclosure, modification, or destruction of data in a system and also [to] the safeguarding of systems themselves'	Importance of data protection Securing systems
2009	Whitman and Mattord	'the protection of information and its critical elements, including the systems and hardware that use, store, and transmit that information'	Protection of information Process of protection
2011	Rowe, Lunt and Ekstrom	'preservation of confidentiality, integrity and availability of information in the cyberspace'	Preservation of information Cyberspace
2013	Bambauer	Cyberspace is a place where systems, networks, and data are placed, the safety of which is termed cyber security. Various technological mechanisms intervene in the requests for access or control of the data held within a system	Cyberspace is a major platform.
2013	von Solms and van Niekerk,	'Cyber security deals with both information-based assets stored or transmitted using ICT and non-information-based assets that are vulnerable to threats via ICT'	ICT major medium

Source: The Researcher

A brief review of the definitions outlined in Table 2-2 reveals a confluence among the different researchers. First, all authors acknowledged that cybersecurity emphasises protecting data and information. Second, they also highlighted that cyberspace represents an important platform that provides meaning to cybersecurity. Alternative definitions of cybersecurity are delineated in Table 2-2 below:

Table 2-2: Alternative definition of cybersecurity.

Terminology	Definition
Cyber world	Benarous, Kadri, and Bouridane (2016) considered the cyberworld and virtual world to be synonymous with the Internet. As such, they described the term as 'a set of machines linked to huge servers that provide different services used by machines' (p.372). Lehto and Neittaanmäki (2018) considered the cyberworld to be closely related to the cyber environment, describing it as comprising 'users, devices, networks,

	software, processes, information in transit or storage, and services or systems that can be connected to networks either directly or indirectly' (p.34).
Cyberspace	Bryant (2016) described cyberspace as 'a global domain within the information environment that consists of interdependent network of information technology infrastructures and resident data including the Internet, telecommunication networks, computer systems, embedded processors and controllers' (p.3).
Cyber ecosystem	Mazurczyk, Drobniak, and Moore (2016) described the cyber ecosystem as 'a community of cyber-organisms, i.e. non-human actors such as processes, programs, defensive and offensive systems that interact between themselves and with the environment' (p.23).

Source: Adapted from Andronache (2019)

2.2.3 Definition of Cyberspace

Gibson's previously discussed definition of cyberspace connoted the idea of a virtual landscape created by computer networks and inhabited by intelligent beings (1984). However, in order to clearly comprehend the term, it is expedient to examine it from the views of other scholars and industry practitioners. It is also important to highlight that the term has since gained significant interest from the non-academic community, including technological strategists, security and military professionals, and medical leaders, together with users of the technology domain (Dawson and Thomson, 2018).

In a literal sense, cyberspace can be described as the interconnection of different forms of technology. This assertion stems from the fact that the Internet backbone comprises three main types of technologies: hardware, software, and protocols (Baldauf and Stair, 2011). While hardware refers to the physical cables and devices that carry data, software describes the different programmes allowing users to interact with the Internet in order to access services and information. Protocols, meanwhile, describe the rules governing the established connections in networks (Bangia, 2005). Different arguments further consider cyberspace to refer to the utilisation of technology in computing environments. This view derives from the understanding that computers have represented an integral part of human culture since the early 1990s. As such, this represents a domain used to refer to the integration of different forms of technology in human beings' everyday life (Li *et al.*, 2017).

The combination of emerging trends in cyberspace, including computer technology and the Internet, has been defined as cyberspace culture (Khin *et al.*, 2016). Lévy (2001) further described cyberspace culture as the set of intellectual and material technologies, attitudes, values, and modes of thought that have developed simultaneously with the growth of cyberspace. In contrast, the author defined cyberspace itself as the material infrastructure of digital communications, the diverse information contained within it, and the intelligent beings that navigate and nourish it.

With this insight, it becomes easier to comprehend cyberspace culture as an ongoing trend in the current world that involves including computer and modern Internet technologies in various aspects of a country, such as health, education, infrastructure, and research. The contribution of this Internet and computer technology cannot go unnoticed, and considerable research has accordingly been conducted on this subject (Safa *et al*., 2018). The majority of such publications examine this contribution in general, and they have proven vital for understanding cyberspace culture.

Cyberspace, as a concept of the Internet, implies that cyberspace usage is not limited solely to global sharing of information in large numbers, but also includes other relevant aspects, such as distributed creation of information and materials, social networking and network marketing, real-time streaming of information from the Internet, mass collaboration of people in the online space to achieve common goals and objectives, collaborative assessment of information shared and distributed online, social bookmarking, and cloud computing, which involves sharing and storing information on the Internet through cloud-storage services for real-time access and retrieval (Chase *et al.*, 2002).

All these services encourage commitment and participation in the online space, thus further encouraging the participation of more people. As a result, this contributes to shaping individual lives, including how people talk, their different communities, and even their identities. Bell (2001) expressed a similar view by postulating that the association between technology and society is two-way; as such, computers not only give form to ideas, experiences, and metaphors, but are also shaped by these aspects as well.

In order to better understand the cyberspace concept, several definitions are summarised in Table 2-3 below:

Table 2-3: Definition of cyberspace.

Year	author	Cybersecurity definition	Significant features
1984	Gibson, W.	'A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts …. A graphical representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity, lines of light ranged in the non-space of the mind, clusters and constellations of data. Like city lights, receding'.	Teaching platform, data, users.
1996	Strate, Lance, Ron Jacobson, Stephanie Gibson, and Gary Gumpert	'Individuals could directly connect their nervous systems to a global computer network referred as the matrix and experience of virtual reality'.	Virtual place, connectivity. Nervous system.
2000	Benedikt	'A common mental geography, built, in turn, by consensus and revolution, canon, experiment; a territory swarming with data and lies, with mind stuff and memories of nature, with a million voices and two million eyes in a silent, invisible concert to enquiry, deal-making, dream sharing, and simple beholding'.	Data, invisible place, sharing
2001	Bell	Cyberspace as a cultural hub is created from machines, people, and stories in everyday life.	The conglomeration of machine, stories, and people in everyday life.
2006	Yar	'The interactional space or environment created by linking computers together into a communication network'.	Interactional space, computers.
2014	Rowland, Rice and Shenoi	'The ever-expanding manifestation of the pervasive information and communications infrastructure'.	Communications infrastructures, information.

Source: The Researcher

The evaluation of different definitions highlighted in Table 2-2 leads to the authors' definition of cyberspace as a virtual platform, wherein interactions occur between technology and individuals

residing in the given space. This insight is important for advancing the discussion of the interrelation between cyberspace and culture.

2.2.4 Culture

A widespread definition of culture describes it as a set of assumptions, beliefs, values, policies, life orientations, and behavioural and procedural conventions shared by and influencing a group of people without necessarily determining the behaviour of each member or their interpretations of the meaning of behaviours by other individuals (Spencer-Oatey, 2008). Eliot (2014) further argued that culture assumes different meanings depending on its scope of application. Eliot (2014) viewed an individual's culture as depending on that of the group to which they belong, whereas the group's culture is further influenced by the greater society.

Subsequently, Eliot (2014) and Spencer-Oatey (2008) advanced the idea of culture influencing an individual, group, or entire society. Strauss and Quinn (2001) resonated with this view by revealing that culture can be anthropologically equated with socially learned behaviours and ideas. At a more detailed level, culture is found to arise from learned organised experiences created by members of a given population, including images and interpretations formed through other individuals, contemporaries, or even transmitted from past generations (Howley, 2016; Lovinck, 2017). Schein (1984) accordingly classified culture into several levels, as depicted in Figure 2-1 below:
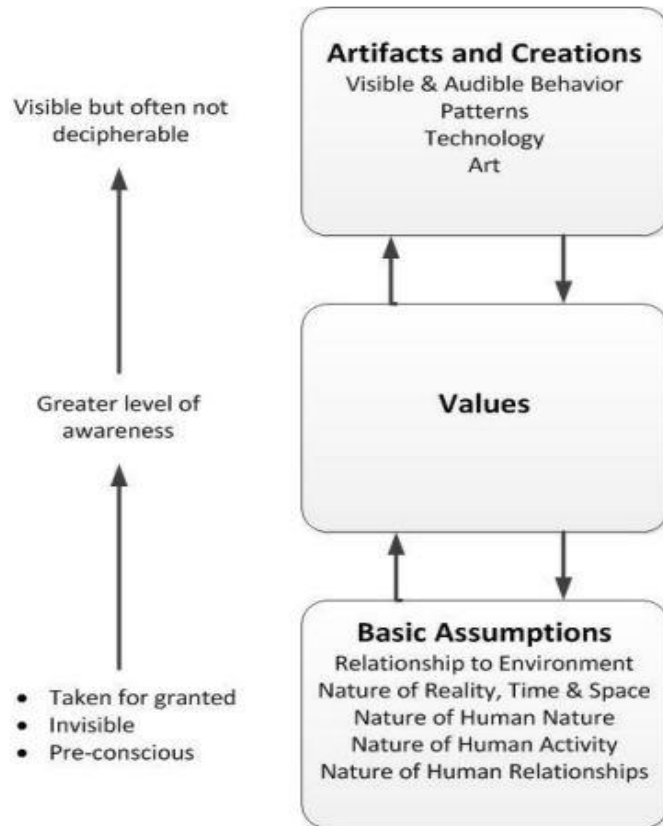
Figure 2-1: The levels of culture and their interaction.

Source: Schein (1984)

Figure 2-1 illustrates the three levels of culture and their anticipated interactions—namely, basic assumptions at the lower level with values and artefacts at the upper levels. Figure 2-1 illustrates culture's influence on observable behaviour through its impact on the value systems and mental models formed in individuals. This theory is elaborated further in Chapter 4.

2.2.5 Cyberspace Culture

A simplistic definition of cyberspace culture describes it as culture that emerges in cyberspace (St. Amant, 2007). St. Amant, however, posited that a universally accepted definition of the term remains lacking due to its underlying complexity. Le'vy (2001) argued that part of the reason for this difficulty stems from the fact that the culture of the future is associated with the 'universal-without-totality' concept. This implies that, though cyberspace culture is virtually present among

all humanity, it lacks totality due to the numerous differences present within it. Despite this finding, however, two definitions of cyberspace culture are considered in this research.

The first comes from Mihalache (2002), who described cyberspace culture as a collection of cultural products and cultures that are made possible or exist in the Internet, along with stories about them. This definition indicates that the Internet comprises an environment inhabited by and associated with its own culture. A more refined definition by Kiliç (2018) identified cyberspace culture as a concept that describes various cultural products and practices that have emerged in the modern world due to the interaction between computers and Internet technology, as well as human behavioural aspects such as hobbies, art, and language.

A confluence can be observed between the two definitions in that they both indicate that cyberspace culture emerges from the interaction of Internet technology and inhabitants residing within the virtual space. While human behaviour is highlighted in the Kiliç (2018) definition, however, this aspect is also assumed in the second definition (Mihalache, 2002) based on the fact that cultures encapsulate interaction. Other authors have developed similar arguments as well. For instance, Bell (2001) claimed that interaction between technology and society is two-way, with computers giving form to ideas, experiences, and metaphors while they themselves are shaped by these aspects. Based on this argument, it emerges that cyberspace culture does not exist independently; rather, it is formed by both the cyberspace virtual landscape and the inhabitants residing within it.

In order to develop an independent definition of cyberspace culture, the foundations of culture must first be examined. Four important underlying concepts of culture facilitate this. The first comprises the notion that culture consists of socially learned behaviours (Strauss and Quinn, 2001). The second concerns the notion that knowledge represents the underlying foundation of any culture at any point in human society's evolution, and as a result, knowledge-construction quality influences the very fabric of a given culture (Haarmann, 2007). Third, culture is founded on human–human interactions (Macfadyen, 2006), and fourth, language represents the carrier of cultural meanings invoked whenever interpersonal communication takes place (Schaller and Crandall, 2004).

From the analysis of the different foundational concepts on culture, it emerges that culture is founded on interpersonal interactions (human–human) made possible through the use of language and knowledge, and further learned through social behaviour. Therefore, to develop the definition of cyberspace culture, these aspects, together with the interaction of technology, need to be incorporated. Based on the different findings, the official definition of cyberspace culture in this research is delineated as follows:

> Cyberspace culture describes a set of underlying, socially learned beliefs that emerge as humans interact with one another through computer-mediated Internet communication, and which influence how they construct knowledge to facilitate this interaction.

This definition comprehensively covers both positive and negative human interactions, where positive behaviour such as empowering discussions are reinforced through positive interaction while nefarious behaviour such as cybercrime emanates from interacting with other individuals who foster such negativity. Therefore, culture is relative and dependant on the nature of human–human interactions occurring through computer-mediated communication over the Internet.

The view that cyberspace culture serves as an avenue of human–human interaction further leads to the understanding that cyberspace culture comprises contributions from a wide scope of academic experts, digital enthusiasts, and computer scientists devoted to ensuring a progressive and advanced use of technology for the community's benefit, as well as the use of technology in cyber-social systems. Cyber-social systems refer to the application of technology in social systems, such as integrating technology in social interactions and utilising social media platforms in normal day-to-day activities (Zeng *et al.*, 2016). The aspect of socially learned behaviours is observed by examining cyber-social systems.

Cyberspace culture represents a concept integrating different reliable techniques for obtaining information on diversified topics rather than being limited to the fixity of information (Goi, 2009). The concept of the online cyberspace culture has thus allowed people to share ideas and information freely on the Internet via blogs, connecting people from different geographical regions

through the ideas to which they align and relate (Chase *et al.*, 2002). This can generate continual integrated meanings, and people can generate a common idea through collective intelligence and share their areas of expertise, and the expertise itself, to generate common goals and objectives.

Cyberspace culture connotes the idea of an avenue to develop different cultures through the use of new technology (Hakken, 1999). Through technology, more people can interact via cyberspace compared to physical interactions (Linhares de Souza *et al.*, 2012). People thus visit the Internet not only in search of entertainment alone, but also as a means of obtaining information they would otherwise not be able to receive, whether due to eminent restrictions in their country or because of geographical or social limitations (Oh *et al.*, 2018; Ding *et al.*, 2018). One can generate one's own resources to face situations that are difficult or forbidden to talk about, and thus actively contribute to society, such as on issues of women's rights and female genital mutilation. Through this ability to access forbidden content on the Internet, the connection between virtual and physical worlds of different cultures is therefore made possible, affecting society (Chase *et al.*, 2002). Accordingly, more and more people are becoming integrated into the core of cyber-culture, influencing society's ability to invent, produce, use, and interpret such vital forms of technology (Billone, 2016).

Cyberspace culture has thus made it possible for men and women who love communicating to create groups related to what interests them and concerning issues that directly affect their lives (Garcia, 2016). For instance, Gunitsky (2015) reported an increased utilisation of social media as a tool for attaining autocratic stability that enables non-democratic regimes to shape discussions held by the public and further undermine their opposition. A different study by Howard *et al.* (2011) further identified social media's significant influence on the Arab Spring through shaping political debates and spreading democratic ideas across international borders. Such studies highlight the increased use of cyberspace as an avenue to lead change on issues that directly affect people in the real world.

People with varied interests can also benefit from the ability to obtain different information regarding different types of content from various sources on the Internet and other forms of media and communication (Chang and Grabosky, 2017). Integrating these forms of technology, communication, and information retrieval and sharing thus encompasses the entire concept of

cyber technology. New cultures tend to arise whenever issues regarding cyberspace development are brought to the fore. In turn, this is shaped by networked computer technologies and related processes (Choo, 2011). The cyberspace culture issue is thus heavily influenced and consequently shaped by the interaction between computers and human beings. Furthermore, the Internet age that has emerged over the years involves making more individuals dependent on cyberspace, thus further enhancing the culture (Chang and Grabosky, 2017). Researchers have accordingly made significant efforts to develop and focus on cyberspace culture; as such, the influence of cyberspace must put into account the interaction between computers and human beings.

An increased number of questions have also been raised regarding whether a mixture of physical and local culture within the virtual cyberspace will lead to the creation of a new culture and orientation or if this will lead to integrating the two cultures without developing a new one. However, this is not dependent on any of the cultures, depending instead on the hybridisation and robustness of the cultures (Goodenow, 1996). In this way, the Internet culture has brought about the development of cultural shocks, leading to changes in the cultures, lifestyles, and cultural productions in one way or another. Therefore, serious thought should be given to the diversity and instability of the different cultures before a new culture is integrated into the lifestyle.

Cyberspace culture is chaotic by nature, as it changes constantly in unpredictable ways. Gunter (1995) argued that its chaotic nature can be deployed in education based on the bounded instability present in educational systems. The events unveil in ways that are unpredictable despite not being random. In higher education cyberspace culture, the aspect of turbulence and ambiguity identified by Myers (1990) leads to the view that chaos theory will enable educators to find some approaches to be of more assistance than others. In essence, it remains difficult for educators to predict which interest groups or cultural communities' students will engage with in cyberspace. The nature of computer-based applications changes, leading to changes to the features of the World Wide Web and other aspects of cyberspace culture. While email is largely based on words, graphics and sound are nonetheless increasing in popularity over time, for instance. Still more changes have also occurred on the World Wide Web as pages have become more likely to contain diverse multimedia, such as video clips and animations. The availability of bandwidth further implies that there will be

more capabilities for users to access heavier content such as videos, as well as to undertake live video conferencing (Fetterman, 1996).

Some authors have argued that, in this way, Internet-based applications heavily influence education (Kitching *et al.*, 2015). Cyberspace is expected to grow radically over the next few decades as advanced video conferencing technologies become cheaper and more reliable, leading to words in conventional email being substituted with more engaging virtual reality sounds and images (Mucic *et al.*, 2016), allowing email's anonymous word-based segments to likely be replaced by exchanges that occur in real-time, with individuals seeing one another as they interact. Lord *et al*. (2016) further predicted that networks with terabit speeds will overcome existing Internet infrastructures, allowing interactive broadband services to become common by 2025. Subsequently, diverse arguments of the 1990s identifying cyberspace culture as being largely anonymous and rich in text will become substantially difficult to sustain in the future.

2.2.6 Recent Advancement in Cyberspace Culture

As cyberspace culture evolves, it brings about a wide variety of complex security issues at a global and national scale. As a result, new strategies that comprehensively cover these security issues must be formulated in order to secure cyberspace operations. Consistent evolution of cyberspace culture eventually leads to numerous innovations and technological advancements to societies, governments, national defence systems, and economies (Gartzke, 2015). However, it is important to highlight that cyberspace culture has contributed to both positive and negative technological advancements. A side-by-side comparison of these positive and negative contributions reveals beneficial innovations such as secure money transfers, online distance learning, social media, and advancements in collaborative scientific research across the globe (Tran, Yonatany and Mahnke, 2016). In contrast, however, negative cyberspace culture has also brought about a rise in viruses, malware, and other forms of cybercrime, including terrorism (Goodman *et al.*, 2007).

As cyberspace culture is continuously advancing and developing in almost all sectors, it has been observed that further progress is being made in enabling connectivity of multiple devices across a network and, most importantly, across wireless platforms and the Internet. These advancements have been witnessed across various sectors, including higher education and healthcare. Additionally, the trends in cyberspace evolution have also led to the development of other

underlying factors, such as social, economic, and other related changes (Bendovschi, 2015). All these aspects of change and evolution in cyberspace bring us to a world in which the networking environment and cyberspace are supposed to be directly involved in the daily lives of the entire population. This subsequently involves changes in the technological, social, and economic aspects of cyberspace (Bower, 2001).

The two outstanding trends in these cyberspace changes comprise lower costs of producing processors, including a reduction in size and increase in processing speed, and the connectivity of networks and their flexibility. With these increasing advancements and technology, cyberspace is slowly evolving to a point where intelligence will be embedded within the machines and wireless technology will be developed to impressive levels. In turn, this means that cyberspace is slowly transforming from what it is today into a global overlay of technical infrastructure. Furthermore, cyberspace is also more involved in most aspects of our daily lives, such as communication, health, education, transport, and defence, among others (Neaimi and Ranginya, 2014). The trends in computer and network capabilities are highlighted below, as they lead to the overall evolvement of the network space.

2.3 Challenges in the Evolution of Cyberspace Culture

Inasmuch as the evolution of cyberspace culture contributes to diverse fields, such as innovation and education, health systems, commerce, and general societal advancements, several challenges must also be addressed in order to facilitate technology's implementation in the new era of cyberspace and to benefit the society and the world at large (Galinec *et al.*, 2017). According to Galinec *et al.* (2017), four key challenges and threats influence cyberspace culture: cyberwar, economic espionage, cybercrime, and cyberterrorism.

Cyberwar describes an action or actions initiated by an international organisation or a local nation-government in an attempt to cause damage to computers or information networks belonging to another nation, such as through the spread of computer viruses and the launch of denial-of-service attacks. Robertson and Arnold (2018) highlighted two real-life examples of cyberwarfare: The accusation that Russians manipulated the 2016 U.S. presidential elections through social media and the development of the Stuxnet worm by U.S. and Israeli intelligence in an effort to sabotage Iranian nuclear power projects. Baezner and Robin (2017) further reported cyberattacks by the

U.S. and U.K. governments against Syria due to the nation's development and use of chemical weapons. Zetter (2016) additionally discussed the shutdown of Ukraine's power grid by Russian hackers in 2015.

Despite using different techniques, these different instances featured a confluence in that one or more nations launched an attack with the intention of causing harm to another. The Cyber Survey Report by Deloitte also reported that, in 2017, unauthorised access to systems represented the major threat faced by digital companies (Deloitte, 2017). Other threats mentioned included hacking (13%), malware and viruses (13%), denial-of-service attacks (5%), fraud (4%), and terrorism (3%).

According to Janczewski and Colarik (2005), cyberterrorism describes any form of premeditated or politically motivated attack by an individual, clandestine agent, or group against the information systems and computer data of another nation that results in violence against the attackers. The authors differentiated cyberterrorism from cyberwar by highlighting that cyberwar leads to enemy losses, whereas cyberterrorism leads to violence against the attackers. Bidgoli (2004) added that cyberterrorism also seeks to instil fear by producing uncertainty and confusion within a population with the goal of coercing its government to conform to a given political or social agenda. The threats stem from cyber insecurity and address the various security threats created by the Internet, the vulnerabilities in preserving the privacy and confidentiality of data, and the threats brought about by including cyberspace culture in the production of modern weapons.

The evolution and use of modern weapons in cyberspace could also threaten the relations between countries, especially when the weapons are misused, potentially leading to the development of inter-government wars. On the Internet, global criminal organisations are also misusing cyberspace to recruit new members and coordinate criminal activities, potentially by spreading false messages and encouraging violent actions online. Jacobson (2010) reported that diverse global terrorist groups from different parts of the world rely on the Internet to spread their nefarious agendas, recruit new agents, and raise funds to support their activities. Bieda and Halawi (2015) added that cyberspace offers a decentralised global platform that facilitates communication among individuals from diverse backgrounds. Through the Internet, terrorists can spread their agendas to

a large number of people by adopting specific platforms that guarantee anonymity, thereby ensuring they remain undetected (Bieda and Halawi, 2015). Furthermore, the Internet enables terrorists to interact with their sympathisers and targets in real time, making it easier to spread fear and uncertainty on a global scale.

However, cyberspace culture also facilitates access to positive information infrastructure. Cyberspace coexists with real space without necessarily being limited by national boundaries, thus enabling better and faster communication among individuals. Scientists and researchers can accordingly collaborate in diverse projects regardless of their locations across the world. Today, the evolution of cyberspace culture is occurring more quickly than the current technologies in the field of cybersecurity. Cyber warfare—a form of latent aggression initiated by one government or organised crime group—represents one of the many challenges faced by cyberspace culture today.

The issues that arise from using technology in areas such as education, health, and other government sectors, such as infrastructural development, must be addressed. For instance, this may involve issues such as the errors that may arise from using new methods and machines that have not been adequately tested. The attacks on government information may also lead to issues such as impersonation and financial attacks intended to weaken the government. In education and financial sectors, corruption can be easily developed, since utilising the Internet in corrupt activities may be untraceable, especially if performed in remote locations via the application of cloud technology (Galinec *et al.*, 2017). This makes aspects such as online education and e-learning appear less promising due to this opening of opportunities for fraudulent activities.

In the following section, the Qatar National Vision, 2030 (QNV 2030) is reviewed in greater detail. The Researcher begins by providing an overview of the QNV 2030, after which each of the pillars in the QNV 2030 is examined.

2.4 Qatar Vision, 2030

In October, 2008, the QNV 2030 was launched as a plan to develop and transform Qatar into an advanced community capable of making certain achievements regarding sustainable development.

This vision plan divides its development goals into four pillars: social, economic, human, and environmental.

2.4.1 Overview of the QNV 2030

The QNV 2030 was created in 2008 in response to an identified need to build a sustainable economy based on knowledge instead of carbon fuels, which were challenged by their susceptibility to depletion (Qatar National Vision, 2030, 2008). As such, the QNV 2030 seeks to transform Qatar into a modern country capable of ensuring sustainable development and high living standards by 2030. This vision serves two main functions: Defining country outcomes on a long-term basis and outlining a framework to facilitate the creation and implementation of national policies and plans.

The QNV 2030 seeks to address several challenges ranging from modernisation and tradition preservation to managing growth and uncontrolled expansion. Similarly, it also seeks to bridge the present and future by providing a roadmap for successful and sustainable development. To that end, the QNV 2030 is founded on the previously mentioned four key pillars of development: human, environmental, social, and economic (Qatar National Vision, 2030, 2008). In regards to human development, Qatar aims to develop its people in an effort to ensure sustainability. The vision plan outlines several strategies to achieve this goal, such as prioritising and investing in world-class scientific research and first-rate education so as to unlock its people's potential; increasing the participation of Qatari people in its labour force in contrast to expatriates; attracting qualified expatriates; promoting access to better healthcare services; and boosting moral, traditional, and cultural heritage (Qatar National Vision, 2030, 2008).

With the social development pillar, the QNV 2030 strives to develop a caring and just society based on the highest moral standards and capable of playing significant roles in global and local partnerships. Locally, the government seeks to promote equality, tolerance, humanitarianism, and empowered women in order to contribute to different economic spheres. Globally, the vision plan seeks to improve partnerships and international cooperation between Qatar and its allies so as to enhance cultural exchange and coexistence levels (Qatar National Vision, 2030, 2008).

The economic pillar, meanwhile, seeks to promote sound management of the economy by fostering attractive business climates. Additionally, it aims to ensure responsible exploitation of hydrocarbon resources to cater to future generations and pushes a transition towards knowledge-based economies that are more globally competitive (Qatar National Vision, 2030, 2008).

Finally, the QNV 2030's environmental pillar seeks to ensure that the country balances meeting developmental goals and protecting the economy. To this end, the government aims to build legal systems and institutions that can vouch for the protection and preservation of the environment. Similarly, it also intends to create sustainable policies that will guide future urban and infrastructural development while minimising its impact on the environment. Figure 2-2 below summarises the four pillars of the QNV 2030:
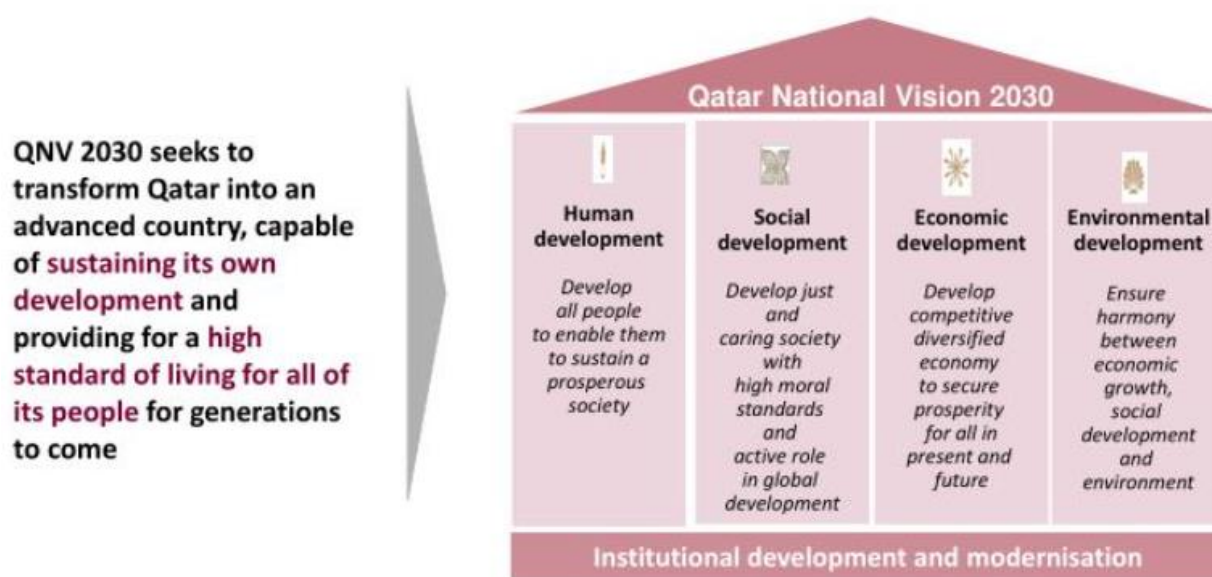
Figure 2-2: Qatar's National Vision, 2030 pillars.

Source: Qatar National Vision, 2030 (2008)

An in-depth analysis of the four pillars reveals a need to adopt technology in order to successfully implement the outlined strategies. This stems from the fact that the plan specifies a goal of modernising Qatar by focussing on a knowledge-based economy and moving away from carbon fuels. However, by adopting technology, an additional concern arises concerning cyberspace

culture and its undue influence on attaining this vision. The following sub-section advances this discussion by examining contributions of cyberspace culture to the QNV 2030.

2.4.2 Contributions of the Cyberspace Culture to the QNV 2030

The current sub-section discusses cyberspace culture's different contributions to the QNV 2030. The first sub-section details how the culture is facilitating economic development in aspects such as securing financial services, boosting competitiveness, and enhancing healthcare. In the second sub-section, cyberspace culture's influence on the education sector is discussed further, and contributions to e-education are outlined. The final sub-section delves further into cyberspace culture's influence on the improvement of social services and environmental conservation.

2.4.2.1 Economic Development

Economic development represents a fundamental issue influencing a country's attainment of economic freedom and its provision of better services, opportunities, and ways of life for its citizens. In the hope of achieving this goal of economic freedom, Qatar seeks to create a working balance between the base of oil and knowledge in terms of driving the country's economy, which would subsequently lead to a sustainable environment in terms of business, encouraging equality in competition, attracting investors, and stimulating the economy's growth. The powerful technologies resulting from cyberspace culture can help Qatar attain this economic independence. For instance, technology will enable an easy transformation of functions previously performed on paper, such as creating documents and sending letters, which can be performed electronically via email (Goi, 2009). A second application concerns utilising the Internet to conduct trade. In this case, this refers to electronic forms of payment included to encourage international trade and remove trade barriers produced by different currencies and countries.

Furthermore, Qatar can also leverage advanced telecommunications technology in order to boost its economic competitiveness. For instance, by implementing transparent communication processes and liberalising telecommunications, Qatar can foster sustainable business environments to attract more investors to the country (Dvornik and Sabolić, 2007). It has also been argued by Dvornik and Sabolić (2007) that investments in telecommunication systems act as stimuli for economic growth. Furthermore, the society also benefits from the provision of more efficient telecommunication services. Additionally, significant research has been conducted on the current market trends that can be leveraged in order to obtain intelligence from the Internet prior to making

decisions regarding business investments (Chang and Grabosky, 2017). Integrating powerful cognitive tools and machines also enhances trading activities. This includes the machine's ability to analyse large amounts of data produced in finance management, as well as how using such machines in trade increases efficiency and transaction speed (Pope, 2011). All these elements have increased the efficiency in conducting trading activities, thus building the country's economy.

Smart city solutions can also be leveraged in an effort to improve management and ensure better delivery of transport and logistics services, waste management, and control of urban centres (Kumar *et al.*, 2018). Kumar *et al.* (2018) further noted that smart technologies are improving the performance of urban services through intelligent and smarter digitalisation efforts. Similarly, urban authorities and policy-makers are being empowered to deliver services more responsively and efficiently. Caragliu and Del Bo (2019) further highlighted that smart city policies boost urban innovation efforts while Haarstad and Wathne (2019) revealed that adopting smartness increases the agenda to enhance sustainability in urban areas. Qatar thus possesses the potential to boost its economic performance by leveraging positive cyberspace culture.

Big data and artificial intelligence represent important emergent technologies that can benefit Qatar in enhancing its governance initiatives. For instance, these technologies can be employed to help minimise incidences of fraud and corruption in public institutions and enhance regulatory quality, as well as adherence to the rule of law (Curti and MihoV 2018). Big data can also be employed to enhance strategic management by facilitating the generation of important insights from existent voluminous data, thereby facilitating decision making and improving the planning of different tactical and operational activities (Silahtaroğlu and Alayoglu, 2016; Merendino *et al.*, 2018). Such insights can boost economic development, particularly when employed in different businesses in Qatar.

2.4.2.2 Education Development

In the education sector, the QNV 2030 strives to develop a strategic plan ensuring credibility in the education process and empowering Qatar's population through world-class education. To achieve these goals, the QNV 2030 seeks to involve the use of scientific and new technologies of research and the Internet (Gasser and Drolshammer, 2015). The e-education objective seeks to support a flexible learning environment allowing students, teachers, and the general population to

access information in a timely manner. Therefore, this implies that education will not be limited solely to school-going students, as adults will also be empowered to further their careers.

Qatar learning institutions can benefit significantly from implementing modern tech-based learning infrastructure that guarantees optimal learning for students and improves content delivery for the teachers. Talebian *et al.* (2014) revealed that ICT technologies alleviate constraints of place and time, thereby boosting learning among students. Adults keen on advancing their careers also benefit from the flexibility of learning at their own pace whilst undertaking their work objectives. Technology-based learning further boosts current educational models, shifting from the traditional teacher-centred approaches to more self-directed content-centred approaches allowing students to direct their own learning (Dunn and Kennedy, 2019). Bognar, Sablić, and Škugor (2018) further reported that flipped learning was also facilitating online discussions, thereby promoting the expression of thoughts and feelings in a friendly manner. Beyond this, Alamri, Watson, and Watson (2020) observed that blended learning environments facilitated personalised learning models in higher education, thereby supporting independent research.

Scientific research in Qatar will also be significantly boosted following the adoption of advanced technologies. However, this will involve acquiring advanced world-class equipment as well as implementing advanced scientific processes. As a result, innovation processes will be improved by improving knowledge-searching processes. Zhou *et al.* (2019) further highlighted how emerging technologies influence scientific knowledge convergence. Additionally, technology boosts collaborative efforts between Qatar and its allies, particularly in advancing science.

2.4.2.3 Improvement of Social Services

The improvement of cyberspace culture has helped Qatar in social areas, specifically in the improved provision of social services and social security (Cottier and Drolshammer, 2018). This also includes improved privacy and better enforcement of privacy concerns, such as confidentiality. Furthermore, the process of data mining, personal information identification, and fair information practices represent some of the areas that will be improved on the path to achieving the QNV 2030.

Data mining, which involves obtaining and using information efficiently, will be improved through services such as Googling of the information and by providing data centres where users can obtain information on certain aspects of their life and matters that concern and interest them (Fiddner, 2015). The identification of users in the online space will also help attain the goals of better data management and efficient planning regarding how the obtained data are employed. Addressing privacy concerns further helps achieve Qatar's goals of better data management and ICT-related issues regarding data use and management. Likewise, social services such as the provision of assistance for solving issues in the social space will also be improved.

The QNV 2030 has been deliberately created in order to align with the International Vision, 2030 for Sustainable Development created by the United Nations. This agenda seeks to empower people and the planet and to ensure prosperity. The primary goal is to ensure peace at the universal level and the general prosperity of the nations and their people. It is also intended to eradicate poverty in all spheres and areas, including poverty at extreme levels—one of the main challenges facing the globe and indispensable for attaining sustainable development goals. Such goals and targets are anticipated to generate action over the next 15 years in several critically important areas for humanity and the planet.

Regarding people, the goal is to end poverty and hunger so as to be accomplished in all forms and dimensions. This should subsequently lead to all human beings fulfilling the potential for a healthy environment with equality and dignity. Regarding the planet, the primary determination is to ensure it remains protected from destruction by promoting sustainable production and consumption that ensures the planet is protected from eventual degradation. Furthermore, this also involves sustainable natural resource management and urgently acting on climate change in order to support any generational requirements in the present and future.

2.5 Cyberspace Culture in Service Industries and Higher Education

This section is further divided into two sub-sections, the first of which examines cyberspace culture in the general service sector. Cyberspace culture's influence on the provision of services such as finance, healthcare, and education in general is thus discussed. Thereafter, the second sub-section details how cyberspace culture affects the provision of higher education in Qatar.

2.5.1 Cyberspace Culture and Service Industries in Qatar

The QNV 2030 seeks to modernise Qatar by 2030 through its four core pillars (social, human, economic, and environment). In-depth analysis reveals that cyberspace culture will directly influence their attainment based on the fact that the QNV 2030 aims to transform Qatar into a knowledge-based economy. Cyberspace culture will thus influence different sectors of the economy ranging from manufacturing and production to service delivery. The current sub-section highlights some of cyberspace culture's expected influences on service industries in the country.

To begin, cyberspace culture is anticipated to transform the delivery of government services through the adoption of e-government, defined as the deployment of information and communication technologies to transform the government's function to be more accessible, accountable, and effective (Al-Hakim, 2007). Through e-government, the government utilises ICT technologies to serve citizens and external clients by meeting their informational and transactional needs (Kettani and Moulin, 2015).

Sun *et al.* (2015) postulated that effective e-government delivery transforms the interrelationship between citizens and the government, leading to diverse benefits such as increased convenience and reduced costs for citizens as well as higher transparency levels and revenue streams for the government. Qatar residents will benefit from the launch of one-stop government portals providing access to different e-services, ranging from the issuance of visas and birth certificates to making payments for utility bills and license renewals.

As cyberspace culture improves access to government services, it further generates a ripple effect regarding the growth of large enterprises and SMEs. First, this is accomplished by enabling them to access required services easily, such as through faster application processes for official business permits and payment for different rates and utilities. Second, cyberspace culture also positively influences SMEs' operations, such as by enabling them to conduct business online through e-commerce platforms. Savrul *et al.* (2014) further revealed that advanced technology enables enterprises to cooperate on a global scale, transforming their commercial activities from local to international spheres. Third, cyberspace culture will also influence decision-making processes in enterprises by generating actionable intelligence through analysis of available data. Ghasemaghaei

(2019) highlighted that data analytics improves the quality of decisions, and thus advocated their use in business. Cyberspace culture is expected to transform Qatar's business industry, especially given that the country is shifting towards a knowledge-based economy. With increased reliance on technology, IT-consulting organisations are expected to emerge over time in order to support the knowledge economy.

The health industry will also be influenced by cyberspace culture through the adoption of electronic health platforms to efficiently manage patient records and allow both medical practitioners and patients to access important medical health information (Cummings *et al.*, 2009). As a result, it is expected that health-service delivery will improve in the country as patients more easily gain access to practitioners. E-health innovations thus possess the potential to improve health-service delivery, making it safer, efficient, affordable, and more universally accessible.

Finally, cyberspace culture is also anticipated to influence the provision of financial services (Claessens *et al.*, 2002). Studies have highlighted that new forms of banking, such as online and mobile banking, have emerged with the Internet's increased distribution. As a result, banks can serve more customers and offer a wide variety of services compared to traditional brick-and-mortar banking institutions. Directly, e-finance implies convenience for customers and quicker access to their finances, while indirectly, it also intimates an improvement in retail business, as transactions can be completed flexibly and independent of geographical locations. Banking institutions will also benefit from e-finance as customers use their services across different economic sectors, effectively generating higher revenue for them.

2.5.2 Cyberspace Culture and Higher Education in Qatar

Cyberspace culture affects higher education in Qatar in two main forms: teaching and learning and the management of learning institutions. The current sub-section discusses cyberspace culture's influence on these two different aspects.

2.5.2.1 Improvement of Learning and Teaching

It has been argued that the Internet world can be considered a fabrication developed using technology and serving as a substitute for reality. In essence, educational cyberspace culture can empower teachers and students with diverse experiences, thereby implying that the experiences might not represent a satisfactory alternative to real life due to their virtual nature. While an

increased speed for training teachers in computer-mediated technology has been identified (Pugalee and Robinson, 1998), along with a commensurate need to connect students to the Internet, it nonetheless remains important to ensure cyberspace is used cautiously so as to avoid disappointing long-term results.

The use of IT in institutions of learning has changed the life and learning process of learning centres. The most basic purpose of education is to gain knowledge of reading, writing, and arithmetic, which is considered literacy. However, the advent of the modern world has led to including critical thinking skills and information and technological literacy on this list as well. Chris Dede, a technology expert, stated in 1966 that all human beings must obtain knowledge in a specific field that will drive them towards a sea of information and specific qualifications. This concept would later be implemented in the technology sphere, leading to the revolution of cyberspace and the education sector in particular.

A shift is being observed in the education sphere as learners are moving towards modern approaches and abandoning the reliance on hardcopy books and other more traditional forms of education (Ho *et al.*, 2010). Some common approaches include using technology in learning, which encompasses the use of technological material or utilising the Internet, also known as online education. This term describes the use of computer and mediated communication via the Internet to engage in learning and teaching in an attempt to attain an institution's learning objectives. The concept of online education includes aspects such as online, web-based, Internet-based, and e-learning. Johnson et al. (2018) further highlights that utilising video-based teaching platforms in online environments also enables teachers to better prepare in the online teaching playgrounds. Xu and Dai (2019) continued by reporting that adopting situational teaching improved online learning experiences and, as a result, advocated for its adoption.

Another fundamental change noted in the education sector in regards to the integration of cyberspace culture involves the transformation of classrooms from conventional brick-and-mortar spaces to more abstract online classrooms that transcend geographical regions and integrate individuals of different nationalities in one classroom (Ho *et al.*, 2010). A second improvement concerns the integration of analytics in education cyberspace culture. Conventionally, student

performance has been analysed through manual approaches such as evaluating examination papers via marking and ranking students after collating all marks.

Analytics, however, is revolutionising the education sector, as teachers can now identify weak areas upon analysing student history, and thus can assist their learners appropriately. Advanced computing tools such as analytic software facilitates such tasks, making it easier for teachers to aid their students. The Internet further enables students to learn on their own in a flexible manner as they access a wide range of content stored in different databases for different education levels.

The use of technology in educational research represents another important evolution in regards to cyberspace and education. By adopting advanced computer technologies such as drones and machines, the research process is further enhanced and becomes much easier based on the access to different testing, analysis, and evaluation tools. Consequently, new approaches to delivery and teaching emerge through technology, leading to the development of new scientific skills in education. The primary importance of including technology in education is that this enables achieving the target of making education open to all, making this a crucial step in the future development of education.

2.5.2.2 Improvement of Management

Cyberspace culture has also led to the introduction of novel management approaches in higher education institutions. One such application includes student support technology, whereby advanced applications are employed by management in order to track students' performance and encourage them to remain on course and finish their programmes (Natow *et al.*, 2017). Though the support technologies are centred on students, however, they also provide important insight for the management to reduce attrition rates. Support technology applications include aspects such as reminding students about upcoming classes, ongoing exhibitions on campus, or setting appointments with course instructors and administrators. As students utilise these technologies, management can track student engagement levels and introduce appropriate strategies to correct any noted issues.

Additionally, cyberspace culture has brought about the utilisation of analytics and big data to enhance decision-making processes in higher education institutions (Liebowitz, 2016). One study

revealed that big data enables management to gain more actionable insight from the analysis of operational and administrative data. Luo (2019) further reported that utilising big data to manage student affairs was becoming a common trend in higher education and was advocated for improving normative management and leading to the adoption of scientific decision-making processes. Institutional analytics represent a core application associated with cyberspace culture that covers diverse aspects ranging from structural to policy analytics. Administrators are empowered to make better data-driven decisions across all major institutional departments while management can also employ the different analytics to make better policies supported by data (Daniel, 2014).

Daniel (2014) further highlighted that analytics also facilitate student-performance management through data-mining applications, which allow management to predict students who are unlikely to complete different courses by analysing already available diverse student data. For instance, this includes data on previous academic performance, classroom behaviour, number of re-enrolments, financial aid, and courses taken. Likewise, Jha, Jha, and O'Brien (2019) reported that tracking of student activity data using big data was also important for identifying students who were struggling to complete their course work and, as a result, led to lower dropout rates. Cyberspace culture is revolutionising management by providing important insights that would otherwise be obtained from outsourced experts.

2.5.3 Culture Management as a Controversial Idea

As discussed in this section, technology is being adopted to facilitate managing various activities and functions in higher education institutions. However, it is worth noting that management of culture represents a controversial idea, as culture is often understood as an emergent, anthropological, and natural concept as opposed to something that can be managed. This assertion is supported by Holbeche (2015), who argued that culture is often difficult to manage and even more complicated to change, as it is broad and deep. Likewise, culture is also deeply imprinted into the employees and interconnected with the firm's politics as well as its structures, people, and priorities (Holbeche, 2015). Alvesson (2014) further stresses that culture is as significant and difficult to manage as it is difficult to understand and use in a thoughtful manner. In another study Buil, de Chernatony, and Martínez (2012) postulate that culture is inherently complex to define due to its multifaceted nature; for instance, it can be categorised into diverse dimensions such as

collectivism, individualism, femininity, and masculinity, among others. As a result, researchers on culture often utilise demographic variables such as race, ethnicity, language, and socioeconomic status as a proxy for culture, thereby leading to an overreliance on group comparisons. The suggestion from different studies (Buil, de Chernatony and Martínez, 2012; Alvesson, 2014; Holbeche, 2015) is that culture can be considered an abstract concept that remains difficult to define, as it exists within individuals and can only be evaluated using proxies. Therefore, any attempts to manage culture produce unanticipated reactions or resistance in the form of counter-cultures. In the same vein, it is also difficult to develop a standard approach to manage culture, as it differs among different individual groups.

2.6 Guiding Principles for Rulemaking in the Cyberspace Culture

The legal policy-making instruments significantly influence policy formulation and implementation when conceptualising cyber rules. As a result, this plays an important role that must be carefully examined before a final decision can be made regarding the cyberspace culture rules and frameworks that are developed. One observation is that political forces have always focussed on striving to be part of the team that administers and organises cyberspace despite the fact that the scientific world and private actors were all active in major milestone developments.

Politics heavily influence the decision-making processes related to cyberspace culture. In most cases, two core powers influence decision-making, including how the government has maintained dominance and the way power has been actively or inactively distributed in the government (Baker, 2016). Government power involves the organisation of political power and how it influences the overall decision-making process of cyberspace- and Internet-governing rules (Barzilai, 2004). The rules developed to govern the cyberspace culture frameworks should thus be developed according to the national governments' competency. However, this includes not only the security issues, but also the usage of cyberspace.

The current and ongoing challenges concerning the regulation of cyberspace culture require a more collective decision-making process covering a broader concept than the traditional form (Weber, 2012). However, one aspect that must be considered involves the influence of international political law. Cyberspace represents an international concept that transcends national boundaries, thus requiring policy-making processes to assume an international approach (Barzilai, 2003). As

a result, global governance will be utilised in order to collectively consider the input of different governments and geographical and global entities, since cyberspace is not limited by geographical boundaries and exerts its influence internationally.

Therefore, it is imperative that global governance includes the collective efforts of cyberspace as an international concept whilst ensuring political leaders remain accountable and responsible in their roles. As such, this must acknowledge the fact that cyberspace culture problems are solved at an international level that transcends the particular governments dealing with them. Subsequently, creation of cyberspace culture frameworks should include collective efforts of entire domestic areas and theories of governments that are independent. The consideration of the type of principle that should be adopted should also be performed in consideration of the general guidelines of independent governments. Tackling the problems for ensuring safety should also be performed with the governments' independence in mind.

An in-depth analysis of the different regulation models that might have led to the development of a new legal order indicates that fresh approaches ought to be employed to build a legal framework suited to cyberspace culture. Subsequently, this will lead to the recognition of a need for the framework's development by concerned members of the civil society and business owners (Weber, 2012). This assessment should also reveal and conclude that, even if the new models are put into practice and established properly, the assessment remains insufficient for constructing an entire legal framework. As such, in general, this includes the process of identifying and obtaining the scope and limits that may lead to a proper establishment of the pillars of cyberspace culture that will be reliable in the future.

The development of the legal framework should further consider the optimal intended conditions, and the safety of society should further be taken into close consideration (Goi, 2009). Utopia, a concept developed by Sir Thomas Morus in 1516, is not a suitable consideration during a rule development plan, as it bears difficulties in identifying data constraints and is inappropriate for combining different elements of a plan in an effort to develop a framework that is globally accepted.

2.7 Recognition of Cyberspace Culture Openness

A side-by-side comparison of cyberspace culture and the information available on the Internet reveals a peculiar finding—namely, that the shared information represents an individual, and the individual thus represents information shared in cyberspace (Rahmed, 2018). This finding directly implies a need for a user-centred approach when devising laws, rules, and regulations to govern cyberspace culture and eventually benefit individuals who live in the digital landscape (Goi, 2009). A need for openness thus arises in developing rules in cyberspace culture. Openness further intimates that the rules are developed transparently without any bias or favouring for a given group, organisation or individual.

Furthermore, the creation of rules to govern cyberspace culture should adhere to rules of neutrality, transparency, and the switching or contract exit (Audibert and Murray, 2016). The common questions that must therefore be considered when creating the rules—and later in their implementation—is summarised as follows:

1. What should be considered in order to ensure transparency and openness between the stakeholders, consumer groups, and standard experts?
2. How can it best be ensured that the benefits to be gained from cyberspace culture are maintained even with increased scrutiny and multiple arrangements of the stakeholders?
3. How can the users of cyberspace culture be provided with the best and most efficient methods of understanding cyberspace's influence on their personal information?

The freedoms of information and communication are crucial for developing the overall cyberspace culture environment. The openness of cyberspace thus coherently aligns with the principle that the Internet represents a public sphere and must be seen as a universality concept (Goi, 2009). When the same is viewed in this perspective, the Internet's openness can be utilised to combat the fragmentation of the network structure (Fiddner, 2015). The European Commission accordingly outlined that the vision of the cyberspace governorship must feature one network that is fragmented.

Incorporating cultural diversity and freedom of expression together with addressing the privacy concerns of cyberspace aids in developing the proper framework for embracing cyberspace culture (Goi, 2009). Other relevant sections include the Internet's neutrality, openness of its standards, open process, multi-linguist, multiple accesses to information, the ethics concerned, and the quality of content (Silverman, 2016). These aspects represent vital elements that must be considered in developing the cyberspace culture and framework.

Fabre *et al*. (2016) emphasised that cyberspace law must adhere to and enshrine three general principles: openness, neutrality, and interoperability. However, this introduces diverse challenges, as some governments and markets are bound to mount resistance against the creation of universal laws. To that end, the authors identified several solutions that could be considered. On the one hand, a Confucian model of self-regulation was proposed wherein citizens generally respect established traditions without utilising any instruments of coercion. However, this approach has been criticised for assuming that all individuals possess similar knowledge regarding the use of cyberspace—a finding that is incorrect, as a few individuals, such as hackers, possess mastery over cyberspace.

On the other hand, it has also been recommended to adopt cyberspace rules that parallel international environmental laws (Fabre *et al.*, 2016). With this approach, any misdeed by citizens of a nation are borne by the government that failed to prevent their occurrence. In hindsight, however, this leads back to the concept of territoriality, as it refutes the universality concept of cyberspace.

A third approach has also been suggested whereby frameworks parallel to international public law are considered (Fabre *et al.*, 2016). With this approach, the laws assume a universality concept in the same way that international public law focusses on a common heritage of all humanity. The Internet would therefore become an asset shared universally by all members and regulated through international treaties. Despite highlighting the different options, however, the authors nonetheless acknowledged that cyberspace regulation has yet to be resolved.

2.8 Gaps in Cyberspace and the QNV 2030

In this section, the gaps identified in cyberspace and the QNV 2030 are delineated. Beyond this, other issues are discussed as well, such as trust among stakeholders of the QNV 2030 and enterprise cyberspace management.

2.8.1 Gaps in Cyberspace

Several research gaps exist regarding the use, development, and governance of cyberspace culture, and particularly the development of the information infrastructure (Silver, 2016). Furthermore, gaps have also been identified in several other areas regarding the application of cyberspace, including the use of computers, their related products, and accessories such as desktop operating systems, routers, and devices designed to facilitate the transfer of messages between two or more computers (Brunn, 2014). However, a different school of thought views this as more of a problem rather than a gap. The development of Internet infrastructure has evolved significantly over the last three decades, changing how cyberspace is viewed and correspondingly utilised to conduct business, run operations, and provide government activities, as well as to ensure people use cyberspace safely.

As these changes become a more permanent feature of life, this further implies an aspect of irreversibility whereby technology will become embedded in almost every kind of activity. Accordingly, this highlights a need for the general population to integrate advanced engineering and technological advancements in their day-to-day business activities. Beyond this, other cyberspace-affiliated aspects have also evolved and improved over time, such as the security considerations of cyberspace culture, use of cyberspace in academic learning, and private use of cyberspace developments in learning (Brunn, 2014). The finding that cyberspace culture encompasses a wide variety of research areas further indicates the existence of gaps that should be carefully examined and filled (Silver, 2016).

2.8.2 Gaps in the QNV 2030

An additional factor that also needs to be thoroughly researched concerns the wide-scale use of cyberspace and the different types of associated problems that arise concerning data security when shared through smaller computer networks and the more expansive Internet platform. Similarly, a concern should also be raised regarding the erosion of people's social, political, and cultural values

due to the Internet's influence. The Internet platform creates a habitable digital landscape wherein different individuals live and, as a result, form a culture for its usage. The United States, for instance, has experienced a vast investment in cyberspace, leading to the development of a cyberspace culture that, unfortunately, has not yet been sufficiently analysed. Further analysis reveals that cybersecurity is the only broad area regarding cyberspace that has been sufficiently analysed despite not being well related to the procedures involved in attaining the QNV 2030 (Brunn, 2014).

The QNV 2030 project thus needs to keenly examine and understand the implications of cyberspace culture that heavily influence the attainment of the QNV 2030, and this should also be related to the education sector. The pillar of economic development, for example, represents one of the major areas guiding the QNV 2030 project. The QNV 2030's strategy of economic development tends to focus on how natural resources could be harnessed together in order to develop an effective management strategy for the QNV 2030. The lack of proper research concerning the effects of cyberspace culture and the approaches employed to integrate it into the QNV 2030 will hinder its successful attainment. As such, the different key aspects of economic development must be included in the cyberspace review.

Integrating cyberspace culture in economic development also possesses an anticipated impact on the population. Specifically, this pillar focusses on integrating Islamic concepts and cultures throughout Qatar as well as rapid humanitarian development in certain areas (Repko, 2018). Subsequently, this calls for research regarding the impact of cyberspace and cyberspace culture and how it affects or may be used to attain the QNV 2030. The implementation of social programmes that call for keen and continuous monitoring should also be strictly observed in order to ensure that all the frameworks and development areas are considered (Fiddner, 2015). The forging of stronger terms regarding the relationship with other countries and regional development comprises another key area that has not yet been adequately researched, including how it will be affected by the integration of cyberspace culture and use.

Human development, which in this case encompasses the health system, education system, cultural awareness, and impact on citizens, is also vital in research. The focus on creating increased and

improved cultural awareness, improved healthcare, and increased use of the Internet and related material in the education system is also vital, but this has not yet been adequately researched (Repko, 2018). In order to address the low rate of Qataris joining the workforce, the use of cyberspace technology should be integrated to foster such developments and attain the QNV 2030 in the area of human development. Therefore, this represents a gap that should be filled and which requires the aeration of a framework to address it.

Environment development comprises another area that should be carefully analysed to ensure successful attainment of the QNV 2030. In this case, the QNV 2030 must be aligned with cyberspace culture in an effort to further generate Internet awareness of environmental conservation and to educate the population regarding its importance (Fiddner, 2015). Research should thus be conducted through the funding of the Qatar National Vision in a bid fill this gap. Consequently, three key research areas are identified and summarised in the following sub-section in an effort to fill said gaps.

2.8.3 Trust among Distributed Parties

Attaining the QNV 2030 involves cooperation between different entities and parties; as a result, it is necessary to establish a working and beneficial relationship without involving a third party or a central society or organisation. The existing research, particularly concerning how different entities and organisations need to establish trust in their data and the cyberspace technologies, has highlighted their needs based on the enterprise users (Silver, 2016). Current research has not adequately filled the gap in this area, however, and so more solutions should be developed by conducting further research.

The scale, complexity, autonomy, and dynamism required to address issues pertaining to the use of cyberspace technology and infrastructure should also be developed and highlighted thorough research. The current research needs to address the models' need for entities that are autonomous and organisations that are geographically distributed. Therefore, a research gap exists regarding the secure relationships on the network in peer-to-peer or other network settings (Fiddner, 2015). In order to achieve such goals as community, health, education, and economic development, further research is necessary.

2.8.4 Enterprise Cyberspace Management

As different entities collaborate in achieving the QNV 2030, a need further arises to link different structural elements of infrastructure, owned by different individuals and enterprises, to cyberspace. Enterprise cyberspace management represents a challenge that must be leveraged so as to integrate different frameworks into one model that can be used to develop cyberspace. The primary function is thus to combine different forms of security and computer mechanisms that will control the behaviour and usage of cyberspace in specific ways. While the market possesses a proliferation concerning the best ways research on cyberspace use could be maximised, a gap remains concerning enterprise cyberspace management (Scharfenort, 2012). For a technology that is still emerging, the research on the legal policy makings and different frameworks governing the same remains under investigation, and it should be carefully analysed and developed in order to lay out implications and their anticipated effects for attaining the QNV 2030, including how they can be mitigated and regulated appropriately (Fiddner, 2015).

The research to be undertaken should emphasise developing the structure of different dynamics, identifying technology implications for possible users, and developing and deploying the usage of cyberspace in general. Beyond this, research should also be undertaken to identify the implications of implementing the alternative and structures for allocating the different positions in diverse application areas in cyberspace. In particular, it is necessary to conduct thorough and comprehensive research on improving cyberspace and the role it plays in attaining the QNV 2030 (Silver, 2016). The collection and retaining or use of infrastructure, and the policies that should be implemented, should also be carefully investigated to determine how they affect attaining the QNV 2030.

2.8.5 Metrics and Models

Organisations, individuals, and critical infrastructure, as well as the associated sectors, must rely on information to implement the risks and challenges that come with adopting and implementing cyberspace and infrastructure (Fiddner, 2015). For the different organisations and individuals to effectively manage cyberspace, which includes accepting, transferring, and externalising the imposed risks, along with applying the necessary resources to reduce them, research must be conducted to manage the same. Research is thus needed to provide a foundation for obtaining and appropriately using data in cyberspace (Weber, 2012). The benefits, impacts, and costs for the

economy, the health system, the education system, and the QNV 2030 goal should also be considered during the research, as a gap exists in this area as well.

2.9 Conclusion

This chapter reviewed diverse literature sources in order to identify current knowledge regarding various thematic areas in the research. Definitions of different terms such as cyberspace, culture, and cybersecurity were detailed in the first section, followed by challenges for the evolution of cyberspace culture. The chapter further reviewed the QNV 2030, demonstrating its interaction with cyberspace culture. In the fourth section, cyberspace culture's impact on service industries and higher education was also explored with respect to Qatar, where different technologies were identified. Guiding principles for developing rules in cyberspace culture were also examined. Finally, gaps in the QNV 2030 were identified and discussed, including aspects such as trust among distributed parties and enterprise cyberspace management. In the following chapter, the reviewed literature is evaluated.

Chapter 3: Literature Evaluation

3.1 Introduction

The current chapter furthers the discussion from the previous chapter (Chapter 2) by critically evaluating the presented literature. By examining the different highlighted thematic areas, the Researcher establishes the existence of cyberspace culture, its alignment with the QNV 2030, and prevalent challenges prohibiting its further development. Beyond this, the Researcher also focusses on establishing the formality of cyberspace culture and its effectiveness in the higher education sector. To that end, the evaluation highlights gaps in reviewed literature that develop into baselines for developing theoretical frameworks guiding the development of cyberspace culture and aligning it to the QNV 2030 vision for higher education. The different thematic areas associated with cyberspace culture are discussed in the first section of the chapter. Particular focus is directed towards establishing the definition of cyberspace culture and its implication for the higher education sector. Thereafter, the rationale for the proposed frameworks (presented in Chapter 4) is detailed.

3.2 Literature Evaluation

In this section, literature detailed under different thematic areas in Chapter 2 is evaluated using the four-quadrant framework (Althonayan, 2003). The motivation of adopting this tool stems from the fact that it categorises reviewed research according to purpose and outcome. With the purpose category, the framework breaks the research further into visionary and implementational. Since the research focusses on cyberspace culture and attaining the QNV 2030, the visionary research focusses on the vision of cyberspace culture and how it affects attaining the QNV 2030 in higher education. Furthermore, the concern is to establish the nature of the current cyberspace culture and its implications as it develops over time.

Implementational research focusses on the practical aspects of the implementation process, such as detailing practical recommendations to facilitate adopting positive cyberspace cultures in higher education institutions, thereby implementing the QNV 2030. Both visionary and implementational research are further sub-divided into descriptive and prescriptive outcomes, leading to a four-quadrant research matrix facilitating the evaluation of the studied literature. The four quadrants include the following: i) visionary descriptive, ii) visionary prescriptive, iii) implementational

descriptive, and iv) implementational descriptive (Althonayan, 2003). Table 3-1 below summarises the literature evaluation framework based on the four-quadrant tool:

Table 3-1: Literature evaluation framework.

Research Philosophy			
		Visionary	Implementational
		Quadrant I	Quadrant III
Research Outcomes	Descriptive	***Describes cyberspace culture definitions and outlines their impact on culture formation*** • Theoretical definitions of core cyberspace culture concepts and their impact on higher education. • Research based on theoretical assumptions supported by literature. • Likelihood to detail conceptual frameworks that model the interrelation between theoretical concepts.	***Describes frameworks and processes of implementing cyberspace culture to facilitate the attainment of the QNV 2030 in higher education*** • Establishes the existence of frameworks to foster cyberspace culture in higher education. • Describes cyberspace culture implementation issues in higher education supported by literature. • Implementation guidelines and discussions, as well as theoretical frameworks, are considered.
		Quadrant II	Quadrant IV
	Prescriptive	***Outlines prescriptive approaches of cyberspace culture and discusses its alignment to the QNV 2030's goal for higher education*** • Prescriptive discussion of the impact of cyberspace culture on the QNV 2030's higher education goal.	***Outlines prescriptive cyberspace culture alignment approaches and discusses processes of aligning it in higher education*** • The alignment of cyberspace culture towards the QNV

| | | • Likely to introduce prescriptive theoretical frameworks illustrating how cyberspace culture ought to be aligned to the QNV 2030's higher education vision.
• Literature-supported discussions concerning the vision of aligning cyberspace culture to the QNV 2030 in higher education. | 2030 goal for higher education may be discussed.
• Challenges and practical recommendations regarding the alignment of cyberspace culture and the QNV 2030's goal for higher education highlighted.
• Detail benefits of aligning cyberspace culture and the QNV 2030's goal for higher education. |

Source: Adopted from (Althonayan, 2003)

Table 3-1 above details the different concepts examined in this research concerning the deployment of the research quadrant framework. The Researcher assigned the different literature studies (discussed in Chapter 2) into respective quadrants so as to highlight literature gaps influencing the current research. A side-by-side comparison of the different quadrants further highlights the particular aspects comprising the literature gap.

3.2.1 Quadrant I Analysis

One of the core aspects of this research involved understanding the cyberspace concept and how it fostered culture, thereby influencing the actions and behaviours of actors who inhabit the virtual landscape. To that end, Section 2.2 defined several important concepts affiliated with cyberspace: cyberspace, cyberspace culture, and cybersecurity. In defining the term 'cyberspace', the reviewed literature demonstrated that the concept's definition has broadened and complexified since its inception in Gibson's dystopian novel *Neuromancer* in 1984 (Gibson, 1984). Additionally, over time, numerous definitions have emerged across different disciplines ranging from anthropology to philosophy. Therefore, this sub-section examines the different viewpoints for defining cyberspace in order to understand its influence on the development of culture. First, the notion of cyberspace as an abstract and imaginary space is discussed, after which the transition to a cultural space is detailed. It is worth noting that the studies examined in these two sub-sections are specific to quadrant I in Table 3-1 above.

3.2.1.1 Cyberspace as an Abstract Concept

Gibson (1984) described the cyberspace concept as a data representation that was graphical in nature and drawn from the memory banks of all computers in the human system. The significance of this definition is that it conceptualises cyberspace as an abstract and virtual non-physical concept. Second, it highlights that interaction with computers represents a fundamental aspect of cyberspace. However, Gibson's (1984) definition remains limited in that it fails to clearly outline the type of inhabitants and interactions that exist in this space. An additional philosophical view by Thomas Hobbes in the *Phantasm of Space* (Slowik, 2014) conveyed a similar idea by delineating cyberspace as an unbounded continuum void of matter (Berdayes and Murphy, 2000).

Benedikt (2000) offered a more detailed definition by relating cyberspace to a world possessing a global traffic of secrets, entertainments, measurements, knowledge, and other forms of alter-human agency assuming a unique structure (sounds, presences, sights) of a vast, blossoming electronic light never before seen on the earth's surface. Benedikt further added that cyberspace represents a common mental geography built by revolution and consensus, and where diverse agents interact with one another to share data, make deals, or share dreams (Benedikt, 2000).

While the definitions by these three different authors shed light on the abstract and imaginary nature of cyberspace, they fail to address how cyberspace intertwines with everyday life in the modern age. For the most part, the definition by Benedikt (2000) intricately describes the nature of interaction within cyberspace through senses such as voice and eyesight, as well as the achievements made by these interactions, including enquiry, making deals, sharing dreams, and simply beholding. It is only upon review of Bell's (2001) work that the concept of cyberspace culture in the modern age comes to light. According to the author, cyberspace represents a hypothetical expanse between computers that allows people to develop new selves and worlds— an aspect described as a symbolic story (Bell, 2001).

Bell (2001) added that cyberspace facilitates interaction between remote actors (material stories) through hardware and software. In this way, the author emphasised the nature of cyberspace as being centred on people, their cognition of self, and the experiences they create in the space. The manner in which people interact and experience cyberspace further serves as a negotiation of

symbolic elements and materials, referred to as experiential stories (Bell, 2001). Consequently, the understanding of cyberspace shifts from an imaginary abstract concept to one centred on individuals and the identities they can assume in such spaces.

3.2.1.2 Cyberspace as a Unique Cultural Concept

Turkle (1995) visualised cyberspace as a simulation culture wherein, even though people fail to see one another, they are presented with an opportunity to create unique communities where they can engage with other individuals on a daily basis and establish deep and intricate relationships. The author thus argued that cyberspace experiences can only be discerned in a cultural context due to the fact that cyberspace creates a new environment for undertaking social and cultural engagement.

Escobar *et al*. (1994) assumed an anthropological view of cyberspace, emphasising the opinion that technology serves as a cultural innovation emanating from specific cultural conditions and facilitating the creation of new cultural and social conditions. The author argued that cyberspace is a culture based on the view that it originates from an established socio-cultural matrix. Therefore, a need arises to discern the two cyberspace phases, the first of which concerns its representation of an imaginary landscape created between computer networks while the second involves its conceptualisation as an expanse that enables interactions between humans, thereby creating new socio-cultural communities and human experiences positioned in the different contexts of their day-to-day lives.

As a cultural space, cyberspace influences the members who live within it (Spencer-Oatey, 2008; Eliot, 2014). This assertion is based on the fact that an individual's culture remains dependent on that of the group to which he or she belongs while the culture of said group is further influenced by the larger society. People interact on a human–human basis through computer-mediated networks, as well as with the software and hardware of Internet technology. As such, the construction of knowledge and the learning of different behaviours in cyberspace occurs in a unique fashion due to the inherent nature of the space.

Consequently, it is necessary to understand the features of cyberspace as a unique cultural space. One such feature involves the universal-without-totality concept, which implies that, though

cyberspace culture is virtually present among all humanity, it lacks totality due to the numerous differences present within it (Le'vy, 2001). Universality possesses several implications, indicating a lack of a central governing authority over the entire space. As a result, negative behaviour has emerged and threatened cyberspace culture over the years, including cyberwar, economic espionage, cybercrime, and cyberterrorism (Galinec *et al.*, 2017).

A second feature concerns cyberspace's invisibility, a concept whereby people are present with each other online, but remain unable to see one another. The significance of invisibility is that it can influence the formation of unique identities and personal characteristics via cultural and social interactions mediated by computer networks (Hine, 2000; Jones, 1995; Nakamura, 2002; Palloff and Pratt, 1999; Turkle, 1995). When people are invisible to one another, it becomes possible to invent multiple personas, leading to the formation of unique identities, both online and in real life (Turkle, 1995).

In the realm of higher education, the diversity of identity and personality formation under conditions of invisibility and universal-without-totality in cyberspace represents a highly important research concept despite the little attention it has received thus far. For this reason, the following sub-section examines the interaction of cyberspace culture and higher education, including current gaps regarding their alignment.

3.2.2 Quadrant II Analysis

This sub-section analyses quadrant II, whereby cyberspace as a tool of learning is discussed further.

3.2.2.1 Cyberspace as a Tool of Learning

In quadrant II, the Researcher outlined cyberspace culture's visionary prescriptive influence on higher education, thereby describing what is expected when the two align accordingly. The QNV 2030 focusses on boosting teaching initiatives, making a shift from traditional teacher-centred approaches to more self-directed and content-centred approaches wherein students are positioned to direct their own learning (Dunn and Kennedy, 2019). Additionally, the literature revealed that the QNV 2030 seeks to empower the scientific community by encouraging collaboration with other researchers in different parts of the world and facilitating the convergence of scientific knowledge in the country (Zhou *et al.*, 2019). However, in order to comprehend the different ways in which

cyberspace culture will influence the attainment of these goals, and to outline current research gaps, it is expedient to examine how cyberspace culture influences learners and teachers separately. As such, this leads to the population of literature in quadrant II.

The evaluation of diverse research studies indicates a divergence in the views held by researchers and educational technologists regarding cyberspace, with researchers adopting the view that cyberspace serves as a cultural space whereas educational technologists perceive cyberspace as an important tool facilitating meaningful learning (Crossman, 1997; Harasim, 1993; Jonassen *et al.*, 1999; Khan, 1997; Land and Bayne, 2012; Zoto *et al.*, 2018). Each of the two paradigms significantly influence the actions undertaken by educators and learners in cyberspace. The general argument advanced in this research is that educational technologists, in an effort to maximise the amount of learning that can be achieved in cyberspace, advocate its adoption as a teaching site.

As a result, cyberspace is viewed as a separate entity empowering human beings to complete different activities. For instance, based on this view, educators and learners utilise cyberspace to solve problems and construct meaningful learning (Duffy and Jonassen, 1992; Jonassen, 1993). When solving problems, both educators and learners search for information on cyberspace and compare different content in order to draw meaningful insights (Jonassen *et al.*, 2003). With the rapid advancement of technology leading to the Internet of things, mobile computing, cloud computing, and big data, cyberspace has grown rapidly to contain diverse types of information that enhance problem solving (Fang *et al.*, 2017). Furthermore, educators also rely on the technologies to create course content and instructional materials more efficiently by building on the research work of other scholars.

Cyberspace further augments the learning process by providing a virtual presence and enabling learners to engage in learning activities without limits of time or place (Hung and Chen, 2001; De Witt and Gloerfeld, 2017). Mobile devices and digital media encourage personalisation and diversified learning formats, as well as different forms of communication and cooperation. Subsequently, learners can experience authentic situations on cyberspace as they boost their learning efforts.

Third, cyberspace also boosts learners' participation and engagement levels, particularly in situations where some feel disadvantaged in taking part in classroom discussions due to factors such as language barriers (Szücs *et al.*, 2013). In other instances, only a small group of learners might dominate classroom discussions, thereby preventing the majority from actively engaging in class (Cope and Kalantzis, 2017). However, through tools such as discussion boards, which are readily available in cyberspace, less-active learners can engage with other students and instructors in ways that are more comfortable to them (Luyegu, 2016). Beyond this, instructors can also use the discussion boards to evaluate student understanding of different concepts taught in class.

Finally, cyberspace also provides numerous tools facilitating collaboration among learners. The social theory of constructivism and learning (Bednar *et al.*, 1992; Lave and Wenger, 1991) posits that collaboration activities help learners appreciate multiple perspectives and construct shared meanings. Furthermore, core cyberspace technologies such as email, instant messenger, and discussion groups extend the diversity of collaborative work outside the classroom, thus fostering further learning regardless of location (Fabos and Young, 1999; McLellan, 1998; Reynolds, 2002; Riel, 1995). Since these technologies are widely adopted, this indicates that they will influence how users learn and collaborate.

3.2.3 Quadrant III and IV Evaluation

This sub-section focusses on literature assigned to quadrants III and IV, which focus on implementational research aspects. Quadrant III literature has descriptively established the existence of frameworks aligning cyberspace culture and higher education, followed by discussions of anticipated challenges in their creation. With quadrant IV literature, the Researcher discussed the prescriptive benefits of implementing cyberspace culture within Qatar's higher education vision and highlighted current challenges in achieving this alignment. Furthermore, the literature also covers practical recommendations to facilitate the alignment.

The literature in quadrants III and IV focussed on aligning cyberspace culture to the QNV 2030 in higher education in terms of implementation. Descriptively, this implies identifying the different ways in which cyberspace culture can either prohibit or enhance the attainment of Qatar's vision for higher education in quadrant III while, prescriptively, this involves identifying implementational issues that will affect their interaction in quadrant IV. A brief analysis of

cyberspace culture's contribution to the achievement of the QNV 2030, as detailed in Sub-Section 2.4.2.2, demonstrates that it emphasised empowering students (both adults and college students) to acquire learning more flexibly without limits of time and place (Talebian *et al.*, 2014). In effect, this highlights the significant role that cyberspace will play in the learning undertaken by users.

3.2.4 Quadrant III Analysis

Researchers have further conceptualised cyberspace as a cultural space (Bell, 2001; St. Amant, 2007). Interactions between technology and society have been argued to occur in a two-way process wherein computers give form to ideas, experiences, and metaphors while they themselves are shaped by these aspects (Bell, 2001). Therefore, inasmuch as cyberspace augments the abilities of learners and educators, it is also important to highlight that, as individuals interact with technology on a day-to-day basis, cyberspace culture emerges and influences different aspects of this interaction, such as identity formation and the social behaviours they adopt in the virtual landscape. These two interrelated aspects cannot be ignored, as using cyberspace to augment one's problem-solving capabilities, for instance, directly translates to spending significant amounts of time in the virtual landscape and, subsequently, creating identities within this space. The literature examined in this sub-section is specific to quadrant III, which focusses on descriptive approaches to aligning cyberspace culture to the QNV 2030's goal for higher education, as stipulated in the literature. Therefore, this sub-section examines how cyberspace, as a cultural space, influences actors (educators and learners) and identifies current gaps that can be filled through this research.

The first examined aspect concerns cyberspace culture's influence over how learning occurs in cyberspace. Jones (1998) argued that, since cyberspace represents a cultural space, a social theory of learning should be employed as a lens for examining learning in this digital space. The author further stated that cyberspace, as a cultural society, comprises an ethnographic site inhabited by people with complex power relationships. Markham's (1998) research on cyberspace also described it as an ethnographic site in which participants think, feel, and act differently in the digital space. In Sub-Section 3.2.2, De Witt and Gloerfeld (2017) postulated that cyberspace boosts learning by providing students with flexible platforms that offer authentic, personalised experiences not limited to time or place. This view resonates with the situated theory of learning, which posits that learning is unintentional and occurs within authentic activities, context, and

culture (Lave and Wenger, 1991). As such, situated learning can also be considered an appropriate lens for examining how learning occurs in cyberspace.

The second discussed aspect pertains to how learning is delivered in cyberspace. The author highlighted that modern cyberspace is structured in such a way that only a few empowered entities provide the larger un-empowered population with digital technology platforms to undertake different activities. For instance, an analysis of social media vendors revealed that few renowned vendors, such as Twitter and Facebook, control the greater number of users on the platform. In the educational technology space, Gregg *et al.* (2017) reported that, while numerous vendors of e-learning platforms exist in the world, only a few of them dominate this space, such as Blackboard, Cisco systems, and Pearson Education. Most higher education institutions tend to rely on major providers as opposed to establishing their own learning platforms due to best practices, which advocate adopting more established systems due to their security and innovation capabilities. In effect, this leads to the notion of 'gatekeepers', or large entities that control how learning occurs in cyberspace. Directly, this implies that creative freedom is restricted, and so the Internet morphs into a place where users become consumers rather than creators (Lessig, 2002).

The third investigated aspect concerns the creation of content in cyberspace and its impact on creators. Despite the fears associated with cyberspace gatekeepers and their influence on limiting creativity within the digital landscape, cyberspace remains highly expansive with flows of global information full of pulses associated with personal experiences (Bell, 2009). As such, in spite of prevalent limitations posed by gatekeepers, digital cyberspace still avails opportunities for different individuals to author, remix, create, and share their freedom fuelled by the Internet to perform diverse activities (Lessig, 2002; Lankshear and Knobel, 2008). Therefore, individuals will continue to produce new content and identities and, subsequently, new cultures. Interests in control of institutions have thus not succeeded in limiting creative freedoms, and individuality remains in global forums. One argument that has been advanced is that personal experiences are still founded in customs, habits, and values, both locally and regionally (Palfrey and Gasser, 2008). The enablement of global culture by digital technologies intimates that individuals will be situated in individual contexts and express themselves in cyberspace.

3.2.5 Quadrant IV Analysis

As digital technologies and cyberspace continue to permeate different aspects of society, diverse authors (Landow, 1992); Apple and Jungck, 1996; Raschke, 2003; Aarseth, 1997) have advanced further debates regarding whether computers act as vehicles of oppression or empowerment. For the purposes of this research, this issue is not moralistic as to whether digital technologies can be considered good or bad in the hands of educators, nor does it imply liberation is oppressive or emancipatory. Rather, it is dynamic in nature, shifting as its users, technologies, and purposes do. In this case, it is not the form that matters, but the content in terms of consumption and production and its effect on users' subject positioning and perceived identity. Martin-Albo and Gregorio-Godeo (2017) also argued that authoring facilitates the creation of identities in figured worlds as social and cultural products. However, in order to understand the formation of identity, the authors highlighted a need to understand this as a dynamic rather than static process. In this research, cyberspace serves as the figured world wherein teachers and educators form new identities through authoring.

Spivey (1997) further discussed the identity-authoring phase that emerges by creating academic, literary, and disciplinary texts, arguing that authors align with the themes and forms they develop through their work. As the author generates a set of texts, a union occurs as the individual and texts become intertwined with each other. In the context of this research, the concept of text is expanded to consider digital and multimodal texts in cyberspace. Therefore, the argument is advanced that teachers who generate online texts are comparable to academic and literary authors. Valdez and Omerbašić (2015) further highlighted that authoring spaces influence identity negotiation and the creation of experiences for both students and educators. Another argument by Soreide (2006) posited that construction and negotiation of identities occurs among teachers as they make presentations related to their work.

The current research thus relates critical theory and digital literacies as they pertain to teachers' authorship of self in educational social structures. Digital literacies and technologies possess no inherent morality (Meyers *et al.*, 2013). Instead, they augment human capabilities and, through technology, enable transformations that alter social structures (McLuhan, 1964). The individual's positions on different subjects is changed as they use technology, which further transforms their

senses and reworks their social structures and interactions. It is thus anticipated that the individual creates new positions aligned with their personal goals rather than being unconsciously influenced by external effects (Palfrey and Gasser, 2008). In this way, each technological stage enhances communication and transforms social structures and consciousness among humans (Ong, 1989).

The phrase 'digital literacy' has been used to express how students, learners, and individuals in society interact with one another through computers (Helyer, 2015). However, with advancements in technology, new interfaces are being created via a wide array of devices, such as mp3 players, mobile devices, and smartphones. As such, the definition of digital literacy should be expanded to cover such aspects (Bell, 2009; Misty, 2015). Such devices enable individuals to author different types of content, including text, audio, and images, thus influencing their positions and identities in cyberspace.

Cyberspace transforms the creation and management of identities as interactions are made more visible through social networks in online spaces, leading to diverse positions. Furthermore, boundaries differentiating identities in online and offline spaces have continued to blur as users represent identities across multiple spaces, cyber or otherwise (Palfrey and Gasser, 2008). Identities that have been created from reinvention and experimentation are presented in a variety of ways. However, a major concern stems from the fact that social identities are more varied and richer and are not highly controlled by individuals as they express themselves in cyberspace. Each individual in cyberspace develops his or her own hypertext that serves as a representation of the manner in which they see the world and how they place it as they decode cultural texts.

The works of Freire (1970), Lessig (2004), and Palfrey and Gasser (2008) framed the current Researcher's approach. A substantive framework of these works influenced the Researcher's thinking and lead to a focus on certain issues. Concerned with control, Freire (1970) explored liberating and oppressive actions. The actions taken by an individual contribute to transforming or reinforcing the status quo. Situated within this research, teachers' visibility increases through actions in cyberspace, perhaps contributing to social inequalities.

Lessig (2004), Palfrey, and Gasser (2008) examined issues related to digital literacies. Lessig (2004) explored creativity and how the Internet enables producing content through remixing. Creating in cyberspace allows individuals to actively participate in the producing culture. Palfrey and Gasser (2008) discussed how participating in online social structures such as Facebook contributes to the authorship of self, both online and offline. The implications are relevant to this research, which involves teachers who operate in cyberspace in increasingly visible ways. Extrapolating from the works of Freire (1970, 1973), Lessig (2004, 2008), and Palfrey and Gasser (2008), teachers' actions in cyberspace shape identity and culture in addition to possibly transforming or reinforcing the status quo within school social structures.

By examining teachers' actions and the online content they create, this research emphasises describing authorship and exploration of the self, as well as the likelihood for change in various practices of teaching. In itself, self-authoring is dynamic and integrates a form of constantly shifting empowerment comprised of horizons, situated literacies, and borders. The term '*situated literacies*' was employed by Street (2003) to define literacy as a practice that was social in domains and events rooted in knowledge concepts, identity, and being. Literacy is both social and active, as people conceptualise it based on their culture and the different ways in which they employ it. However, an additional factor regarding the creation of boundaries to limit authorship activities also emerges.

Nonetheless, the creation of online content provides a technique for boundaries to be crossed and dialogue to be initiated with other individuals. The argument advanced is that liberation and empowerment form part of self-authorship and are not given or won externally (Freire, 1970; McLaren, 1995). Empowerment begins with a self-perception shift as the individual author internally morphs from a state of oppression to empowerment, which further manifests externally. The narrative provided by Douglass (1995) demonstrates this point, highlighting the power of this shift in self-perception as the researcher's identity changes from a slave to an oppressed human being. The current research explores self-perception processes when teachers interact with digital spaces; the social structures further bring about empowerment and liberation actions, or else cause further oppression. This research thus also attempts to comprehend the shift in the authorship of teachers' selves, revealing positionings as they generate more content in cyberspace. Teachers

described what transpires as they intermix their lives with practices that are digital and professional in cyberspace.

3.3 Existent Literature Gaps in Cyberspace Culture and Higher Education

The analysis conducted in quadrant I detailed findings regarding how cyberspace culture could enhance the attainment of the QNV 2030. Based on the view that cyberspace can be used as a learning tool that augments the learning experience for students and teaching experience for instructors, an identified literature gap concerns the lack of frameworks guiding both parties in aligning cyberspace culture to the established goals. Such frameworks would help learners understand cyberspace as an external identity that helps augment their learning capabilities by improving collaboration and virtual presence and which aids in solving different problems. Stepwise guidance is necessary to lead novice learners to attain expertise in employing cyberspace culture to boost their learning experiences. Similarly, instructors also need to be guided so as to appreciate cyberspace's value in enhancing their teaching activities. For instance, the frameworks would guide educators in selecting the best cyberspace teaching tools and improve the preparation of course instruction.

Based on literature evaluated in quadrants II and III, several research gaps were also identified. The first concerns learning in cyberspace and questions how the unique and situated nature of cyberspace can be leveraged to enhance the QNV 2030's attainment. For instance, a need was noted for higher education institutions to adopt technologies available across multiple platforms, such as mobile devices or desktop computers, in order to provide a seamless learning experience and leverage situatedness. It is further argued that, since most of the learning that occurs in cyberspace is situated, it is necessary to develop best practices to ensure that the community of students and educators will easily boost their learning experiences in the digital space.

The best practices will guide novice learners in acquiring expertise through participation that is peripheral in the cyberspace community practice. Additionally, it was noted that, though a dominant viewpoint of cyberspace identifies it as a learning tool in educational technology, few studies have established how novice learners become experts through a community of practice in cyberspace. A greater number of studies have emphasised the effectiveness of communication tools that learners employ in cyberspace or the design of learning environments for scaffolding

learners' meaningful learning. If educational technologists wish to design effective learning environments for successful learning in cyberspace, they should know how learning occurs there. Concerning how learning is delivered in cyberspace, a second research gap also emerged regarding whether Qatar would rely on dominant entities to supply educational technology to facilitate the QNV 2030's attainment in higher education. A need has arisen to prepare contingency plans for both scenarios whereby, if the institutions choose to adopt popular digital technologies to facilitate attaining the QNV 2030, frameworks and best practices must be put in place to guide the procurement of digital technologies employed in learning. The Researcher further reported that frameworks have been developed to facilitate integrating blended learning in higher education (Garrison and Vaughan, 2013), blogging in higher education (Kerawalla *et al.*, 2009), re-engineering of educational technology education (Kelley and Kellam, 2009), and more. However, these are only to be used as a basis for understanding the integration process, as they are not specific to the situations in Qatar. Meanwhile, where institutions opt to develop their own technologies to facilitate cyberspace learning, the Researcher argues that there will be a need to develop frameworks and best practices that guide the development processes.

In regards to the creation of content in cyberspace, a third research gap was also identified in guiding authorship among teachers in digital landscape. This gap concerns the identities of teachers who employ websites and social networks to add to their teaching practices, as well as what happens to them as they use digital technologies to go about their lives and their teaching. Drawing on the perspectives identified in the ongoing debate concerning authorship and creative freedom in cyberspace, it has been revealed that cyberspace provides both learners and educators with an avenue to create new identities through global interactions. When left unchecked, these identities and social interactions are likely to lead to nefarious activities, such as terrorism and cybercrime. Therefore, the Researcher identified a gap in creating frameworks and best practices that will foster positive cyberspace culture to boost the attainment of the QNV 2030. However, these frameworks must be created in lieu of the fact that cyberspace governance remains challenged by the Internet's openness and the seeming lack of jurisdiction. To the best of the Researcher's knowledge, no such frameworks exist in Qatar, specifically in aligning cyberspace culture to the QNV 2030.

In quadrant IV, a fourth research gap was also identified regarding how cyberspace influences identity formation. From the revelation that personalised devices aid in authoring different types of content, authorship is thus not limited to educators and teachers, but also comes from learners as they employ cyberspace to create authentic experiences. In this research, the form of the digital devices, tools, and programmes is arbitrary; the focus remains on the teachers' situated practices, as well as the representation and understanding of ideas and selves. The current research thus explores authorship and subject positioning through social structures, creation of spaces online, digital mixing, and content in cyberspace.

Cyberspace culture studies have been employed to refer to studies that consider interactions of culture, technology, reality, and identity in cyberspace. Cyberspace culture studies are transdisciplinary, representing diverse strands of work across numerous subject areas (Bell, 2009). Cyberspace culture describes the ways in which life is modified by representations and practices embedded in cyberspace. In effect, this describes a manner of thinking about interactions between people and technology based on narratives outlining the different ways in which digital technologies have changed lives and led to the construction of new identities (Bell, 2009).

Table 3-2: Research literature evaluation.

Research Philosophy			
		Visionary	Implementational
		Quadrant I	Quadrant III
Research Outcomes	Descriptive	(Gibson, 1984) (Turkle, 1995) (Jones, 1995) (Palloff and Pratt, 1999) (Berdayes and Murphy, 2000) (Escobar, 2000) (Hine, 2000) (Bell, 2001) (Le'vy, 2001) (Nakamura, 2002) (Spencer-Oatey, 2008) (Eliot, 2014)	(Gregg, Holsing and Rocco, 2017) (Lessig, 2002) (Carr, 2009) (Garrison and Vaughan, 2013) (Kerawalla *et al.*, 2009) (Kelley and Kellam, 2009) (Valdez and Omerbašić, 2015)

		Quadrant II	Quadrant IV
	Prescriptive	(Galinec *et al.*, 2017)	
		(Talebian, Mohammadi and Rezvanfar, 2014)	(Jones, 1998)
		(Dunn and Kennedy, 2019)	(Markham, 1998)
		(Zhou *et al.*, 2019)	(Bell, 2001)
		(Crossman, 1997) (Harasim, 1993)	(St. Amant, 2007)
		(Jonassen, Peck, and Wilson, 1999)	(Kiliç, 2018)
		(Khan, 1997)	(De Witt and Gloerfeld, 2017)
		(Land and Bayne, 2012) (Zoto *et al.*, 2018)	(Lave and Wenger, 1991)
		(Duffy and Jonassen, 1992)	(Bell, 2009)
		(Jonassen, 1993) (Jonassen *et al.*, 2003)	(Palfrey and Gasser, 2008)
		(Fang *et al.*, 2017)	
		(Hung and Chen, 2001)	
		(De Witt and Gloerfeld, 2017)	
		(Szücs *et al.*, 2013)	
		(Cope and Kalantzis, 2017)	
		(Luyegu, 2016) (Bednar *et al.*, 1992)	
		(Lave and Wenger, 1991)	
		(Fabos and Young, 1999) (McLellan, 1998) (Reynolds, 2002)	
		(Riel, 1995)	

Source: Adopted from (Althonayan, 2003)

3.4 Conclusion

This chapter evaluated the reviewed literature in depth based on the four-quadrant framework analysis approach. Subsequently, several research gaps were identified in each of the quadrants, effectively providing a rationale for the framework development chapter. The view that cyberspace can be employed as a learning tool that augments students' learning experience and instructors' teaching experience indicates a gap concerning the lack of frameworks guiding both parties to adopt cyberspace culture appropriately. Furthermore, cyberspace's unique and situated nature further indicates a need for best practices to guide novice users in learning institutions to adopt technologies that are available across multiple platforms, such as mobile devices and desktop computers, in order to provide a seamless learning experience and leverage situatedness.

Additionally, only a limited number of studies have outlined how novice learners become experts through a community of practice in cyberspace. The importance of frameworks to guide such development thus emerges in order to ensure meaningful learning in diverse learning environments. Similarly, such frameworks guide the creation of content in cyberspace identity formation without adversely affecting the actors in such spaces. In the next chapter, the procedure adopted for developing this research's conceptual framework is detailed. Likewise, existent related frameworks and theoretical models are also reviewed to facilitate the model's conceptualisation.

Chapter 4: Framework Development

4.1 Introduction

In the previous chapter, the Researcher presented a literature review of different themes in the research, after which current research gaps were identified. Cyberspace culture can be considered a relatively new concept based on the fact that the influence of technological culture, as a new research paradigm, has not been widely studied over the last three decades (Manuel, 2010). As the rate of change increases in the field of information and communication technology (ICT), the levels of risks posed to information-asset security similarly increase. As a result, information security culture is focussing on socio-cultural measures that produce an important influence on supporting security methods to improve employees' daily lives (Schlienger and Teufel, 2003). Therefore, processes for understanding and identifying beliefs, ideas, and values of different groups based on information security are essential for shaping and guiding business and security-affiliated strategies (Ramachandran *et al.*, 2008).

Malcolmson (2009) argued that the security culture adopted in an organisation could significantly influence the security of its human and physical resources. The author posited that security culture affects the nature of interactions occurring between employees in the organisation and established procedures outlining acceptable and unacceptable behaviour. Nonetheless, diverse theories and models have been developed to explain how culture is created and maintained. However, limited studies have examined how cyberspace culture is fostered and maintained, thus requiring further investigation. In this chapter, the key cultural theories of Schein (1984) and Hofstede (1983) are analysed, along with current frameworks of cyberspace culture.

Following this, the proposed framework is presented after careful analysis of the existent literature gaps. Four cyberspace culture frameworks are selected to guide the development of said proposed framework: the ISF (Alnatheer and Nelson, 2009), the ISCF (Da Veiga and Eloff, 2010), the Information Security Culture Framework (Shabbaan, 2014), and the Information Security STOPE framework (Al-Hogail, 2015). These frameworks are examined further in this chapter.

4.2 Organisation Culture

The focus of this research concerns gaining an understanding of how cyberspace culture facilitates the QNV 2030's implementation in higher education. Since this research conceptualises higher education institutions as organisations, theories of organisation culture are deemed appropriate for

understanding how cyberspace culture influences their operation. Furthermore, drawing from other cyberspace culture studies on higher education (Okada and Ferreira, 2012; Junqueira, 2015; Teixeira *et al.*, 2017), the Researcher determined that organisations and communities are referred to as the basis of the research. Therefore, organisation culture is adopted as a lens for researching the different aspects associated with fostering cyberspace culture.

A confluence observed from the review of diverse studies concerns a lack of a single accepted definition of organisational culture in the literature, given that numerous scholars and authors have interpreted culture in different ways over the years. According to Louis (1980), organisational culture can be considered a group of shared meanings by people that, though largely tacit among members, are nonetheless clearly relevant and distinctive to the given group and are also passed to new members. Chatman and Eunyoung (2003), meanwhile, further defined this as an arrangement of shared assumptions, values, and beliefs that direct people's awareness of suitable and unsuitable behaviour.

A different perspective by Alvesson (2003) described culture as 'an umbrella concept for a way of thinking which takes a serious interest in cultural and symbolic phenomena'. The author further added assumptions of social reality and values to the definition. A more popular and widely referenced definition by Schein (1992) posited that organisation culture describes a set of essential assumptions shared by a group as they learn how to solve their problems of internal integration and external adaptation, and which have worked well enough that they are considered sufficiently valid to be taught to new members as the proper way to think, perceive, and feel in regards to the problems.

While diverse theories have broadly explained how culture is created, this research adopts two theories based on their appropriateness for this research—namely, Hofstede's cultural dimensions theory and Edger Schein's organisation culture theory. A major reason for choosing these two theories stems from their wide-scale acceptance in the scientific community and their use in diverse cultural studies in different contexts and geographical regions across the world

4.3.1 Hofstede's Cultural Dimension

As reiterated in the previous sub-section, organisation behaviour comprises an important element, and Hofstede (1983) strongly believed that the presence of local and national cultural groups can influence organisational behaviour. As such, this theory was developed to comprehend cultural

differences across countries and differentiate various methods of conducting business across different cultures. An argument advanced by the author was that organisational culture is constrained by national culture (Hofstede, 2001). Culture, as a largely human process, involves different approaches for implementation across different societies. Each society possesses a unique set of values, beliefs, and way of life, which present themselves as cultural differences. Hofstede outlined five dimensions of culture: individualism vs collectivism, power distance, uncertainty avoidance, and masculinity versus femininity. Figure 4-1 below summarises these dimensions:
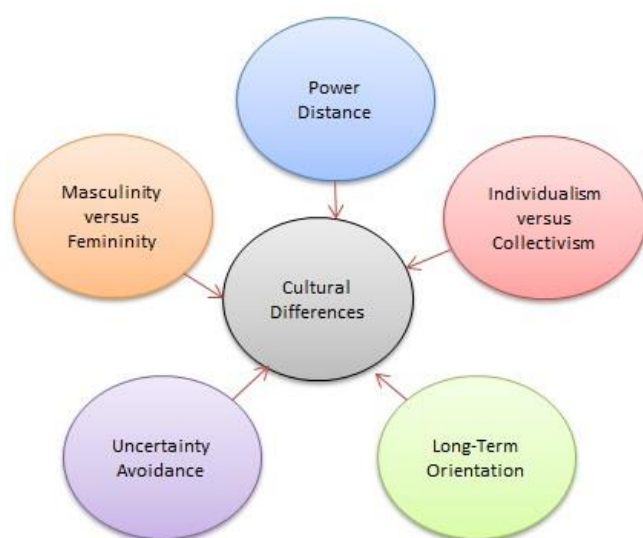
Figure 4-1: Cultural dimensions.

Source: Hofstede (2001)

Power distance focusses on the degree to which less-powerful individuals accept that power distribution in the society is actually unequal. Uncertainty avoidance concerns people in society that cannot accept ambiguities or any sort of uncertainty, while individualism and collectivism emphasise people's preference to either be alone or to hold strong ties with people in society and live in a knitted sort of close network. The masculinity dimension focusses on the society's preference for being heroic, assertive, and hard working for their achievements while femininity represents the cooperative, modest, and quality-of-life-based traits. Long-term orientation focusses on finding virtue in the long term.

The key contribution of Hofstede's theory in this research concerns the identification of different cultural dimensions that characterise different regions or countries. As each dimension demonstrates different behaviour in various societies, this helps contextualise Qatar as a masculine or patriarchal society characterised by high power distance and uncertainty avoidance. Directly, this indicates that Qatar possesses a conservative culture and is highly likely to resist changes in their cultural attitudes. The findings in the current research will therefore refute or confirm such claims.

With individualism, people tend to look after only themselves and their immediate blood relations. In contrast, collectivist cultures feature people being integrated into solid groups and looking after the entire group in exchange for intemperate loyalty. According to Hofstede (2010), the United States scores highly as an individualistic culture, unlike Indonesia, which records a lower score. Inequalities also occur in human societies in terms of power and wealth. As a result, power distances emerge that can be considered large or small. Countries such as Malaysia possess large power distances, thereby indicating that humans are perceived as less important. Such societies emphasise inequality, unlike the Netherlands, where its small power distance boosts equality among people.

The uncertainty of the future implies that people ought not to be upset, but should rather demonstrate tolerance for ambiguity. Hofstede asserted that this dimension was not familiar among many individuals, especially in the case of the IBM, as the author resorted to using available data from its archives (Hofstede, 2009). In countries featuring high uncertainty avoidance, such as Japan, Hofstede revealed that they are aggressive and respond better to navigation aspects, unlike Singapore, a country possessing low uncertainty avoidance and that tolerates such behaviour. Where countries display high masculinity, traditional roles are anticipated, with men's values being more pronounced than those of women. However, an overlap of gender roles can be observed in highly feminine countries, as men not only dominate, but also facilitate (Hofstede, 1984, 2010). In spite of the wide recognition of Hofstede's framework, it has also been criticised by numerous authors. For instance, McSweeney (2002) did not accept this framework as a universal approach, believing instead that surveys were not a reliable method and that nations should not be employed as a unit for examining cultural differences. The author further elaborated that this framework was not reliable, as employee results drawn from one company could not represent an entire score of the nation as a whole, and relying on only five dimensions was not sufficient to completely

represent cultural characteristics. McSweeney (2002) further argued that IBM data were old and could not apply in the modern century. Orr and Hauser (2008), meanwhile, expressed the same criticism when evaluating Hofstede's dimensions. The authors identified a need to thoroughly re-examine theoretical constructs within the 21st century context of behavioural patterns and cross-cultural attitudes. Signorini *et al.* (2009) continued by criticising the 'over-simplification' of differences in culture and inconsistencies between categories in Hofstede's 5-D model in addition to identifying fault in it being static rather than dynamic. Other scholars (Kwon, 2012; Yeh, 1983; Fang, 2003) have similarly expressed reservations regarding Hofstede's model, but even still, it remains a widely employed framework around the world.

In the field of higher education, Hofstede's dimensions have been employed in numerous studies, making the theory more dominant in this research. For instance, Sriwindono and Yahya (2012) utilised these cultural dimensions to explore how they affected the acceptance of Management Information Systems (MISs) among Indonesian academics. Cheung and Chan (2009) further used the model to understand how cultural dimensions aligned with processes for meeting the demands of competitive economies through education. Additionally, Viberg and Grönlund (2013) employed it to investigate students' attitudes regarding the use of mobile technology for learning second and foreign languages. Popov *et al.* (2012), meanwhile, employed this model to identify challenges faced by multi-cultural students in undertaking group work, as well as their perceptions of the challenges.

4.3.2 Schein's Model of Culture (1984)

According to Schein (1984), organisational culture can be categorised into three major titles functioning as a guiding model for companies to understand the behaviour of individuals working within those companies. Despite being presented in the 1980s, Schein's model of organisational culture has been used globally by authors and scholars. This model was developed to evaluate the formation of culture within an organisation. Edgar Schein believed that culture could not be developed within one day, instead arguing that culture development represents a continuous process undertaken after numerous activities have been conducted by the individual, including problem-solving, customer and supplier relationship procedures, and stakeholder engagement (Schein, 1984).

The knowledge and experience gained from these activities helps form the shape of the workplace, described as its culture (Schein, 2013). Therefore, culture is broadly defined as a pattern of

essential shared assumptions as a group learns to solve its problems of adaptation externally and integration internally in ways that have worked well enough to be considered valid, and thus sufficient to be passed on to new employees as the proper way to think, feel, and perceive relative to those problems (Schein, 1992). Figure 4-2 below illustrates this model:

Figure 4-2: The levels of culture and their interaction.
Source: Schein (1984)
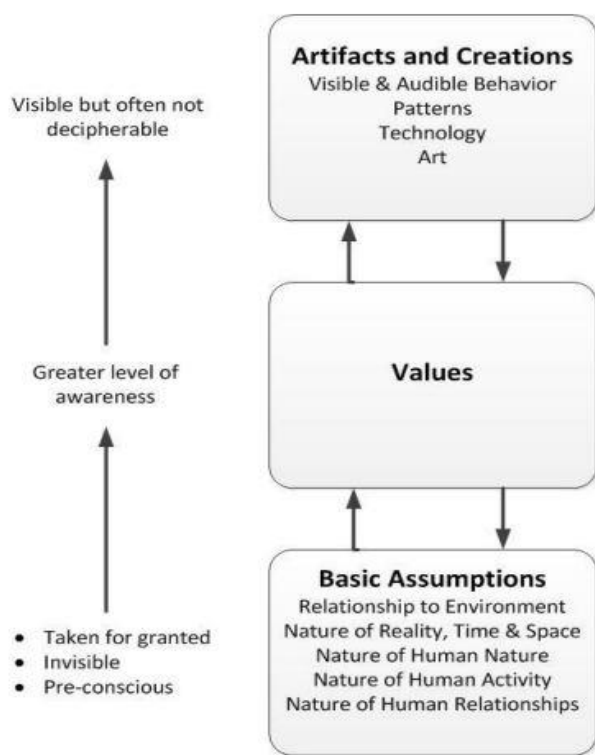
According to Schein's model, culture possesses three levels: The first category—artefacts and symbols—includes any tangible or physical elements in an organisation that can be easily seen and experienced. The elements could include company or product logos, architecture, processes, and even corporate clothing. These elements are also observable to external parties, not just employees. The second category—espoused values—comprises strategies, principles, and rules of conduct for the organisation. Leaders' and managers' behaviour in relation to organisation goals and strategy depict espoused values practiced within an organisation. The third category—basic assumptions—comprises strongly embedded beliefs within the organisation that are considered a

core element of culture. These three categories can function as guiding principles for understanding organisational culture.

According to Schein (2013), leadership represents a key source of values and beliefs, and as such, the most important issue that leaders must consider involves understanding deeper culture levels and dealing with any anxiety that emanates from challenging assumptions. Although Schein's model is well recognised in the scientific community, however, several reservations have been advanced against it. De Jonge (2006), for instance, argued that, since the model is based solely on surveys and interviews with employees, these attributes cannot be considered a major element of culture. Furthermore, De Jonge (2006) claimed that this level represents the basic dynamic element of organisational culture that is often overlooked by organisational behaviourists.

One of the justifications supporting the adoption of Schein's organisation culture model in the research stems from the fact that it has been adopted by other researchers to examine how organisational culture influences strategy implementation. For instance, Hogan and Coote (2014) employed the framework to conceptualise innovation processes in law organisations while Dauber *et al.* (2012) employed it to develop a configuration model of culture, and thus to explore dynamic relations between organisational strategy and culture and external environmental factors. Ostroff *et al.* (2012), meanwhile, also used the model to understand the interaction between organisational culture and climate, as well as their influence on employee performance, behaviour, and attitudes. In the higher education sector, Taye, Sang, and Muthanna (2019) further utilised Schein's model of organisation culture to develop a conceptual framework to study organisational culture's influence on performance.

A second justification for adopting Schein's framework of organisation culture stems from the fact that Schein provides the most popular and accepted definition of culture adopted in the context of organisations (Lacatus, 2013). As such, Schein's theory emphasises the fact that leaders play a role in shaping and reinforcing an organisation's culture. This research subsequently employs this theory to understand how leaders shape and reinforce the culture of higher education organisations.

4.4 Cyberspace Culture Frameworks

Primarily, the focus of cyberspace security has largely concerned technical security measures, leaving human behaviour regarding information security unstudied in the past. In response, a need was identified for addressing this 'human factor'. In previous years, authors have accordingly explored how individuals perceive information security and why they are encouraged to adhere to

security practices. Moreover, a strong relation exists between organisational culture and behaviour, as culture influences behaviour. Similarly, it can be argued that cyberspace culture is formed on the basis of employees' cyber behaviour, with cyber behaviour referring to employees' interaction with information assets and security.

While diverse cyberspace culture frameworks are available in the literature, only a few are elaborated in this research based on their suitability and relevance to the research questions. The selected frameworks largely focus on the higher-level adoption of secure practices rather than adoption at only an organisation level. Beyond this, the frameworks are also employed to understand the formation and dissemination of information security process at a higher level, where work culture, as well as the culture of a geographic location and social constructs, are studied.

4.4.1 Four-Quadrant Framework Evaluation

The current research analyses and compares the prominent works in this field using a four-quadrant framework, wherein all the research and resolution aspects of these literature studies are observed. The adopted approach resembles the one utilised in Section 3.2, where the reviewed literature was analysed using this framework. Tables 3-1 and 3-2 discuss the evaluated literature. The comparison and analysis of these four selected frameworks can be developed using the four-quadrant framework as a literature evaluation tool. The framework is primarily employed to categorise the academic and industry-based contributions to the literature. The framework categorises research according to the research aim (visionary or implementation) and the final output, categorised as either descriptive or prescriptive (Althonayan, 2003).

Research classified as visionary focusses on an idea, vision, or proposal in literature as opposed to the dynamics and implementation process. Implementation research, meanwhile, focusses on practical recommendations for a particular procedure. An interesting fact to consider is that such studies can be either descriptive or prescriptive in their outcome (Althonayan, 2003). A better way to view the comparisons in the four-quadrant framework would be through a matrix. Such a matrix can sum up the four main categories as follows:

I)   Visionary and descriptive;

II)   Visionary and prescriptive;

III)   Implementation and descriptive; and

IV)   Implementation and prescriptive.

Table 4-1: Literature evaluation framework matrix.

Research Philosophy			
		Visionary	Implementational
		Quadrant I	Quadrant III
Research Outcomes	Descriptive	1) Describes information security culture in workplaces. 2) A sort of conceptual framework can be proposed. 3) Implementation may not have been discussed. 4) Almost all supporting research is based on description.	1) Issues related to information security culture will be discussed. 2) A diagnostic framework may be discussed and detailed. 3) Guidelines related to implementation are discussed. 4) Supporting research and examples are empirical.
		Quadrant II	Quadrant IV
	Prescriptive	1) Possible integration within an organisation is discussed. 2) Theoretical framework detailing the culture of information systems may be mentioned. 3) The research will give at least the most basic version of the implementation.	1) The integration of information security culture within all major areas of the organisation is discussed. 2) Steps, challenges, and practical application of the integration will be discussed. 3) The advantages of the execution as per the empirical data will be discussed.

Source: Adopted from Althonayan (2003)

This framework is utilised to comprehensively classify literature by determining each study's contributions. The categorisation of academic and industry research is performed in order to explicate the present literature gap, which will significantly influence research.

4.4.2 ISF Framework

This framework is relevant to the current research, as it was developed in the context of Saudi Arabia, located in the same geographical region as Qatar. As such, similarities in landscape and

can be interlinked, providing a detailed evolution of major differences in the organisational setting. According to Alnatheer and Nelson (2009), information security culture and practice can be influenced by numerous factors, such as those ranging from information security awareness and training programmes, policy, risk analysis and compliance with information security management standardisation, top support from management, and organisational culture.

The broad factors are grouped into three major themes: corporate citizenship, comprising awareness and training programmes on information security; legal and regulatory environment, made up of standardisation management and best practices; and information policies on information security and corporate governance, consisting of support for information security management from top management, compliance with information security, and risk analysis. Similarly, the framework adds a cultural theme that stipulates a culture that is both national and organisational and which strongly influences security-culture adoption. Nonetheless, Alnatheer and Nelson (2009) highlights that, despite the improved economic development observed over the years in Saudi Arabia, its information security culture in workplaces remains in its infancy. As such, it usually includes measures of culture and ethics introduced so as to enhance an organisation's security-related behaviour and usually said to be an organisation's subculture.

The framework also advocates aligning corporate governance, legal and regulatory environment, and corporate citizenship in any given country. Furthermore, it also recommends aligning these aspects to the national culture, forming the primary foundation of organisational culture. Additionally, further development of security culture is equally important for developing an information management culture in any country. Figure 4-3 below presents this in detail, where it can be observed that national culture represents an important aspect in this regard. However, the missing element of organisational behaviour still needs to be investigated, as it can differ from one organisation to another.
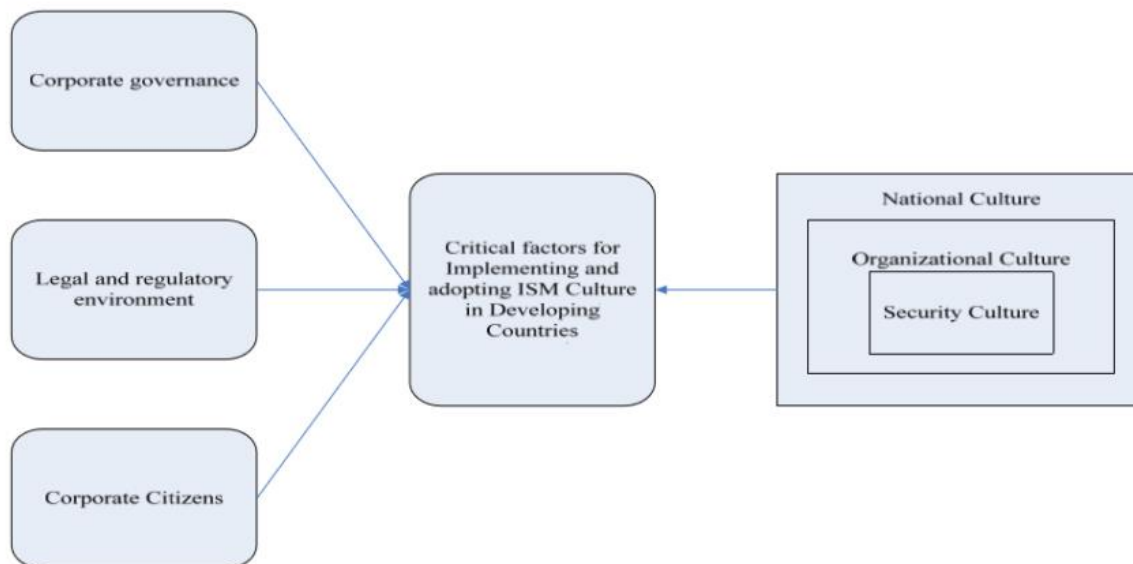
Figure 4-2: ISF framework.

Source: Alnatheer and Nelson (2009)

However, the research by Alnatheer and Nelson (2009) stands out in that the authors focussed on the information security culture in Saudi Arabia. Moreover, Western standards remain in a stage of infancy where companies' information security protocols are concerned. The authors determined that Saudi Arabia's social, economic, and cultural environment deeply influences organisations' information security culture. Moreover, it was found that employees largely possessed an extremely lax attitude regarding information security. Therefore, this framework is visionary and descriptive, as it proposes ideal ways in which information security can be improved and describes the various conditions for practicing information security in Saudi culture. Subsequently, the framework falls under quadrant I due to its descriptive nature.

4.4.3 ISCF Framework

One noteworthy aspect is that organisational behaviour and information security components must be aligned together in order to develop an information security cultural framework. The framework comprises three interlinked levels offering a major source of cultural formation. The process begins with information security components conducted in the organisation. The components are conceptualised as factors that influence behaviours towards securing information in an organisation when different components are executed, such as regular interactions between employees depicting certain information security behaviour.

The regular interaction establishes a certain culture, thereafter considered the information security culture (Da Veiga, 2008). Components could include a security policy (Robbins, 1998) serving as a guideline for completing assigned tasks, and the organisation can also develop a certain strategy to implement the policy that later develops certain assumptions and values. Therefore, it can be understood that information security cultures represent a combination of artefacts, values, and assumptions developed from information security behaviour. As elaborated by Da Veiga (2008), on the organisational tier, training sessions on information security policy can be identified as artefacts resulting from the policy component.

Moreover, Veiga and Eloff (2014) provided organisations with the rationale for the need to be aware of the process through which culture would eventually determine the level of risks posed to information assets. Similarly, with the understanding of the prescription of employee behaviour, this article offers guidelines for developing the most successful strategies for managing employee behaviour and the development of efficient organisations promoting the elimination or minimisation of possible internal and external sources of threats to the company's information security system. In the end, however, it is imperative to note that the framework instrument for information security culture, as developed by various organisations, should always consider several factors, such as organisational culture and employee behaviour.

Da Veiga and Eloff (2010) utilised empirical studies to validate the proposed security framework. The primary goal was to teach the general human resources of an organisation to actively and consciously engage in information security activities so as to minimise information breach. To this end, the authors conducted implementation and prescriptive research targeting the organisations' need for a complete framework that considered the lack of a security-conscious culture. Based on its prescriptive and implementation status, the framework falls under quadrant IV. Figure 4-4 below summarises the ISCF framework:
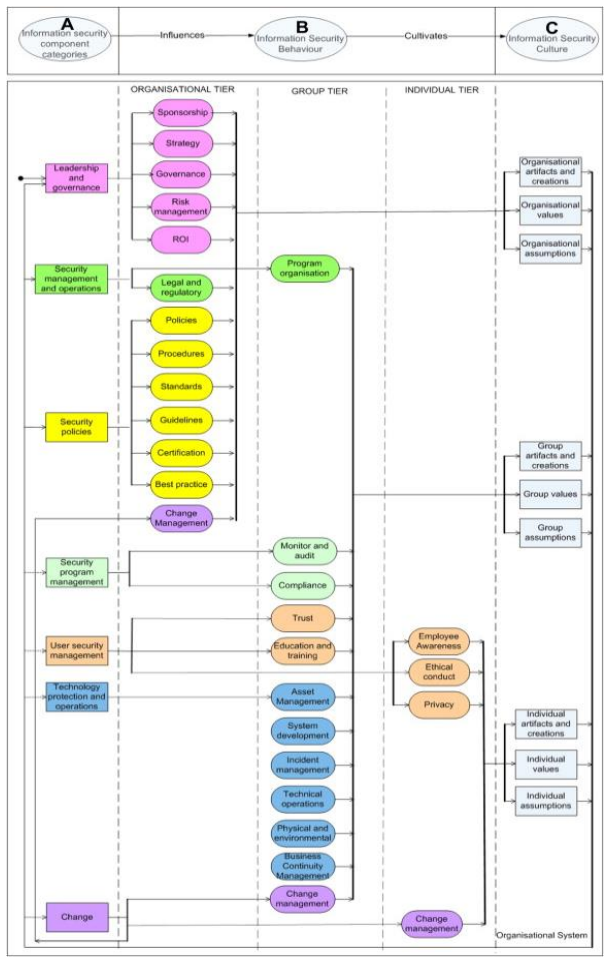
Figure 4-3: ISCF framework.

Source: Da Veiga and Elof (2010)

4.4.4 Information Security Culture Framework

The research further explored information security governance and diverse cultural factors influencing information security management. Figure 4-5 summarises the information security culture framework:
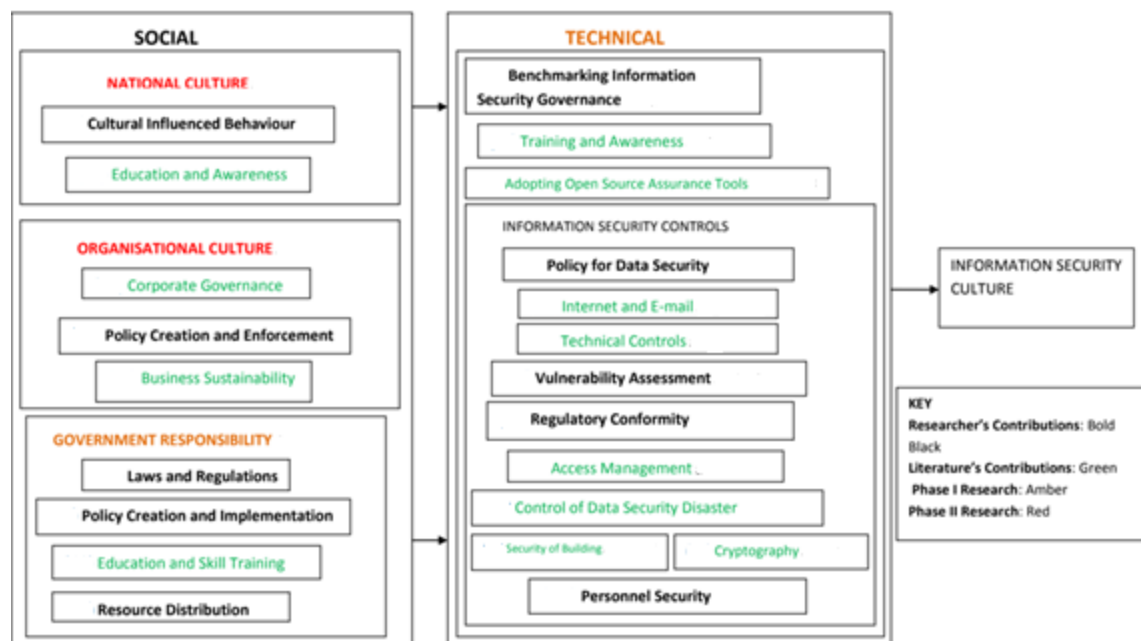
Figure 4-4: Information security culture framework.

Source: Shabbaan (2014)

Shabbaan (2014) explored information security governance by incorporating ISO/IEC 27002 best practices in information security management. The author argued that the practices could help an organisation enhance its governance practices and provide a benchmark for current practices. Shabbaan (2014) also presented descriptive research exploring how culture influenced information security management. Similarly, an implementational framework for improving information security management in non-profit organisations was also developed.

A breakthrough was achieved due to the framework also using ISO/IEC 27002 best practices in information security management in an effort to obtain required technical guidance in this research. The research framework emphasises priorities and implementation steps of information security and enhancing governance practices in information security among developing countries. In identifying these steps, the research further helped facilitate adopting new technologies in organisations. While the framework focusses specifically on Zanzibar, the research effectively drew its findings and conclusions from evaluating various socio-cultural dimensions in significantly socio-technical contexts.

In this sense, there is a need to consider priorities such as cultural, legal, device, and ethical dimensions of the society before enhancing approaches for implementing strategies that would be crucial for supporting the integrations of information security and information security management within the society. At the same time, the author highlighted implementational practices by providing knowledge on possible steps, changes, and transformations in information security and information security management utilisation in developing nations such as Zanzibar. As a result, the framework falls under quadrant III due to its descriptive and implementation aspects. Additionally, the identification of cultural issues influencing the adoption of information security and information security management should be addressed as a means of enhancing the adoption of the most imperative frameworks that would also offer opportunities for future research and evaluations of the manner in which Zanzibar and other developing nations could develop enhanced methods of information security governance. Beyond this, such a move would also help ensure profitability and the achievement of sustainable competitive advantages among organisations operating in such regions, as attested by Bne (2013).

4.4.5 Information Security Framework – STOPE

This framework seeks to clarify the association between diverse factors linked to the information security culture in order to serve as a guideline for professionals and managers in the implementation process. Al-Hogail (2015) proposed such a framework and discussed various components of human factors, such as training, responsibility, society, management, and regulations. The framework proposes to reinforce information security culture by validating from experts the practices that can be employed to develop a culture that protects the information assets. The proposed framework also integrates principles of change management that direct the usage and installation of an information security culture. The framework is validated by allowing experts to offer their perceptions regarding the completeness and correctness of the framework and all activities. The framework can also help companies build an operational culture of information security to safeguard business assets. Furthermore, in this visionary and prescriptive framework, Al-Hogail sought to describe the implementation of strategies in IT. Specifically, these strategies concern the importance of design and the validation of information security culture. Within this cultural perspective, the most imperative issue relates to the implications of employees' perceptions, as well as security behaviour within the organisational culture.

However, contrary to the works of Alnatheer and Nelson (2009), this article emphasised the need for developing an organisational culture that effectively reduces information threats perpetrated by insiders within the company. While developing various implementation strategies, the article focussed on the need for a comprehensive information security culture framework structured by considering people, technology, environment, strategy, and organisation. Combining these elements brings forth the realisation of STOPE as a means of forming a successful information security framework that adequately addresses various information security issues while also maximising not only profitability, but also overall sustainability of competitive advantage. In focussing on implementation strategies for information security culture design and validation, the author conducted evidence-based research utilising expert responses and survey outcomes. This research approach produces the understanding of a prescriptive study, as evaluated by Blessing and Amaresh (2009). As a result, the framework falls under quadrant II. Figure 4-6 below summarises the STOPE framework:

Issues: Human Behavior Diamond	Scope:					Development Tool: Change Management
	S	T	O	P	E	
Preparedness	Prepare employees to behave securely through training, awareness, knowledge acquisition, and change in perception.					Training
						Focus groups
						Change agents
Responsibility	Ensure employees are behaving securely through monitoring and control, reward and deterrence, and applicability					Motivation
						Milestones and measures
						Involvement
Management	Ensure management support by showing management commitment, effective communication and interaction, and facilitation of resources.					Management support
						Resources
						Communication
Society and Regulations	Consider external factors such as national culture, ethical conduct, government initiatives, and legal and regulations system					Culture analysis
Outcome: behavior (artifacts), values, assumptions and knowledge to enhance information security						
Older State			TIME			New State

Figure 4-5: Information security framework – STOPE.

Source: Al-Hogail (2015)

In summary, the four cyberspace culture frameworks are assigned to the four-quadrant matrix, as illustrated in Table 4-2 below:

Table 4-2: Classification of cyberspace culture frameworks.

Research Philosophy				
Research Outcomes	Descriptive	Visionary		Implementational
		Quadrant I		Quadrant III
		ISF Framework (Alnatheer and Nelson, 2009)		Information Security Culture Framework (Shabbaan, 2014)
	Prescriptive	Quadrant II		Quadrant IV
		Information Security framework – STOPE (Al-Hogail, 2015)		ISCF (Da Veiga and Elof, 2010)

Source: Adopted from Althonayan (2003)

In this section, current information security frameworks were reviewed so as to guide the development of this research's conceptual framework. The following section examines the various gaps present in the reviewed frameworks.

4.5 Gaps in Existing Frameworks

Across the different frameworks, one observed confluence was that they all focus on teaching and proposing ways in which the human factor of information security can be dealt with. Most authors dealt with the technical aspects of information security, but less work was conducted on cyberspace culture. The relationship between company employees and cyberspace culture practices were evaluated in all these studies, however, and it was ultimately determined that employee awareness and training were vital for minimising security threats (Verizon, 2009). Most of the organisations lacked a satisfactory information security culture, and as such, an average of 2–3% of potential business was lost with clients who valued information security, while leakage of ideas and confidential information also affected the organisation's profits, along with its integrity (Mcllwrath, 2016).

However, a glaring research gap was identified across these four frameworks in that, while instructions and ideas for implementing these frameworks were provided in the studies, the authors failed to address how a cyberspace culture framework can be maintained following implementation. Moreover, these studies did not emphasise leadership's role in the cyberspace culture. The reviewed frameworks in Section 4.4 should also focus on the leadership roles, as they possess considerable significance for the organisations involved. The leadership decisions can help organisations avoid any future potential loss of business, for instance. Beyond this, leadership also plays a critical role in supporting governance regarding the implication of cyberspace culture. Moreover, leadership should also support and focus on building the cybersecurity culture within the organisation. The development of such a cyberspace culture can help the leadership to develop a greater business environment in the modern era. Human mistakes will always arise, and malicious human sentiment will never be completely eliminated, so it is necessary to develop possible measures to keep cyberspace culture safe once it has been implemented.

Table 4-3: Identification of the framework gap.

Elements	Alnatheer and Nelson's Framework	Da Veiga and Elof's Framework	Shabbaan's Framework	Al-Hogail's Framework
Leadership	X	X	X	
Policy		X	X	
Technical competency		X	X	
Government regulation	X		X	X
Organisation culture	X	X	X	X
Management / governance	X	X		X
Security culture	X	X	X	
Change management		X		X

Source: The Researcher

Table 4-3 above displays the research gap according to the selected criteria. Based on the evaluation, the first, second, and third frameworks mentioned the aspect of security culture (Alnatheer and Nelson, 2009; Shabbaan, 2014; Da Veiga and Elof, 2010). However, the frameworks failed to highlight the development of cyberspace culture, thereby motivating the development of the proposed framework. Regardless, the various authors identified some of the components necessary for fostering cyberspace culture, such as leadership and government regulation.

4.6 Cyberspace Culture Framework

In this section, a framework is proposed for fostering cyberspace culture in line with the research gaps identified in Sub-Section 3.2.2 in the previous chapter. The sub-section begins by briefly summarising said research gaps and providing a rationale for variables that should be considered in the framework. Thereafter, framework elements are discussed and summarised in the second sub-section.

4.6.1 Derivation of the Cyberspace Culture Framework

In Sub-Section 3.2.2, several research gaps were identified in regards to aligning cyberspace culture with the general vision for higher education. A review of the vision revealed that it sought to achieve three key objectives: boost teaching initiatives by making a shift from traditional teacher-centred approaches to more self-directed and content-centred approaches; enhancing access to learning in cyberspace; and promoting the scientific community by facilitating collaboration with other authors in different parts of the globe and converging scientific knowledge. Based on these goals, the Researcher identified current research gaps in aligning cyberspace culture to the country's established vision.

By considering cyberspace as a learning tool to augment problem solving, enhance engagement, and provide authentic learning experiences, the Researcher observed a gap in enabling cyberspace adoption by learners and educators to attain the set objectives. Since cyberspace is viewed as a tool to augment human capabilities, it is necessary to outline best practices to guide the adoption of technology-based tools. The goal of the vision is to advance higher education institutions such that learning becomes learner-centred and teaching practices are boosted to world-class levels. However, without guidelines and best practices detailing how to adopt such technologies, this

vision cannot be attained. Therefore, the role of leadership and regulation emerges as a pivotal aspect in the proposed cyberspace culture framework in Figure 4-7.

Furthermore, by considering cyberspace as a cultural space, a research gap was identified in guiding how learning occurs in cyberspace. Based on the theory of situated learning (Lave and Wenger, 1991), this thesis argues that, since learning is unintentional and occurs within authentic activities, it is necessary to leverage the situated and personalised nature of cyberspace. As such, this raises a concern regarding how learners would be guided in attaining expertise through a wide array of devices and platforms without veering from the goals established in the higher education vision. Therefore, the aspect of espoused values and assumptions emerges in the proposed framework. The Researcher argues that learners should not perceive learning as limited solely to certain devices, such as computers. Rather, smartphones and mobile devices that deliver audio or image-based content should also be considered. As such, this implies that assumptions such as 'I believe that learning through a mobile device will be beneficial' should be promoted through the creation of policies. Additionally, this also implies that technical training is further required to facilitate adopting modern tech-based tools.

A third research gap was also identified in outlining how learning was delivered in cyberspace. Though it was argued that reliance on corporate gatekeepers would stifle creativity and freedom of self-expression, it would nonetheless take time to develop custom learning platforms and to market them in higher education institutions. As such, best practices to facilitate the selection of educational technology vendors are recommended. Subsequently, this indicates a need for leadership and responsibility so as to guide procurement processes and ensure the tools deliver as required. Frameworks guiding change management and behaviour change are also identified as a pivotal point in enhancing cyberspace culture.

The fourth research gap concerns the creation of content through authorship in cyberspace. Cyberspace technologies are being accessed not only by students to learn different subjects, but also by teachers to develop instructional content. As such, teachers who produced sets of texts online created identities similar to authors of academic and literary texts. The identified gap thus pertains to the identities of teachers who utilise social networks and websites to complement their teaching practices and, subsequently, what happened to them as they employed digital technologies to go about their lives and their teaching. In order to ensure that teachers maintain their identities in cyberspace, a need for responsibility, leadership, and regulation arises.

In summary, the review of previous theoretical frameworks in Section 4.4 revealed that the human aspect has largely been ignored by most authors, who have focussed more on the technical aspects of culture. The current research seeks to fill this gap by highlighting important aspects that should be considered in managing the human aspect of culture development. To this end, the following section accordingly describes the components of the proposed cyberspace culture framework, a diagrammatic representation of which is presented in Figure 4-7.

4.7 Elements of the Cyberspace Culture Framework

The analysis of current research gaps in the previous section highlighted several pivotal aspects that directly influence the successful alignment of cyberspace culture and higher education. These aspects are discussed further in this section. Before this, though, it is instructive to highlight that elements describe the particular components that make up the framework, (e.g. internal elements such as leadership and management strategies). However, factors also include the individual issues associated with a particular element; for instance, under the internal element leadership and management strategies, accountability represents a factor.

To begin with, the internal elements of the cyberspace culture framework are elaborated further. In describing how leadership and management strategies are formulated, insights from the ISCF framework (Da Veiga and Eloff, 2010) are adopted. Likewise, inputs from the STOPE framework (Al-Hogail, 2015) are further utilised in developing the security policy aspect while the information security culture framework (Shabbaan, 2014) guides the conceptualisation of best security practices and technical competency. In the second sub-section, the external elements of the cyberspace culture framework are delineated, whereby the government's role in influencing policy, regulations, leadership, and technical competency is examined. Further analysis of the QNV 2030's influence on the strategy-formulation process is also undertaken. The third sub-section discusses insights from theoretical perspectives regarding culture formation (Schein, 1984; Hofstede, 1987). Examining the different theories highlights important dimensions evaluated in the research, such as the bi-directional relationship between levels and dimensions of culture. In the fourth sub-section, the contribution of the cyberspace culture framework is elaborated further, highlighting new insights regarding cyberspace culture creation.

4.7.1 Internal Elements of the Cyberspace Culture Framework

This sub-section discusses the various internal elements of the cyberspace culture framework. In essence, internal elements describe aspects over which higher learning organisations can exert control. Such aspects include strategies adopted in management and leadership, security policies, and technical competency in security, as well as best practices implemented.

4.7.1.1 Leadership and Management Strategies

Leadership and management strategies adopted in higher education institutions are also important for guiding behaviour change and the actions of learners and educators in cyberspace, as well as within organisations. Accordingly, the ISCF framework (Da Veiga and Eloff, 2010) identified a need for responsible leaders who guide the daily interactions of employees, thus leading to culture formation.

4.7.1.1.1 Improving Accountability

According to Leonard *et al.* (2016), various aspects of leadership, such as personal qualities, administrative actions, and behaviours influence culture formation and maintenance within a given organisation. By definition, accountability describes the quality or state of being accountable, leading to an obligation or willingness to accept responsibility for one's actions. Ghanem and Castelli (2019) argued that accountability in leadership is crucial for protecting business and organisation ethics, as accountable leaders facilitate the development of ethical organisational perspectives. Their study accordingly identified accountability as a significant predictor of ethical leadership. Likewise, moral competence was identified as an important moderating factor, as increased moral competence enhanced positive effects of ethical and accountable leadership. Leaders are tasked with the responsibility of selecting appropriate technologies to facilitate authorship for teachers and educators as well as learning technologies for the students. Without proper strategies in place, novice educators and learners will experience significant challenges in enhancing their technological competence. The analysis of these aspects highlights that leadership plays an important role in guiding the QNV 2030's implementation in higher education, and thus illustrates a need to ensure accountability. Accountable leadership is accordingly associated with the capacity of higher education leaders to implement effective technologies that facilitate attaining the 2030 higher education vision and the cultivation of a positive cyberspace culture. Leaders should be accountable to the outcome of the strategies they propose and implement within higher education institutions.

4.7.1.1.2 Risk Management

Strategy formulated by leadership and management plays an important role in boosting individual learning institutions' competitiveness. Leaders in particular play an important role in managing the risks that may be faced by higher education institutions by fostering an appropriate culture within their organisations (Fleming, 2004). Furthermore, leaders are also tasked with selecting and implementing strategies to facilitate attaining different objectives in higher education institutions while also ensuring conflicts are resolved and accountability standards maintained. In this regard, the nature of adopted strategies are associated with risks as they directly influence the progress of developing cyberspace culture in the organisations. In a different study, Tsai (2011) also reported that an organisation's culture directly influences the adopted leadership behaviour and, subsequently, employees' job satisfaction, attitudes, and behaviour. Therefore, the risk management strategies arise in two ways: The first arises because leaders determine how various strategic objectives are achieved through fostering appropriate culture. As a result, risks associated with accomplishing the strategies emerge, as they may fail to facilitate attaining strategic objectives. The argument advanced in this regard is that the formulation and implementation of ineffective risk management strategies by organisational leaders introduces risks to the organisation in the event that the strategies fail to address targeted problems. This assertion is supported by Fadun (2013), who argued that effective risk management helped prevent the failure of risk management strategies adopted in a business firm. Second, as reported by Haughey (2020), leaders play a role in developing cybersecurity resilience frameworks that enable their organisations to detect and contain different types of cyber threats that may be launched against them. To minimise cyber threats and attacks, the researcher adds that there remains a need for management and leadership to not only employ competent chief information security officers, but also to nurture a culture of cyber resilience and create formal policies for cyber security (Haughey, 2020). Therefore, this indicates that the nature of management strategies implemented to enforce a given culture will likewise directly influence the various factors.

4.7.1.2 Security Policy

In addition to responsible leadership, security policy also emerged as an important element guiding the actions of different employees in higher education institutions.

4.7.1.2.1 Security Awareness

The proposed cyberspace culture framework adopts the preparedness and responsibility aspects of the STOPE framework (Al-Hogail, 2015). With preparedness, STOPE highlights the importance of preparing employees to behave securely through awareness, training, and perception changes. Similarly, the responsibility aspect outlines the value of ensuring employees behave securely through monitoring and control, as well as through deterrence and reward. The proposed framework advocates creating policies to ensure users' information-security behaviour by outlining acceptable and unacceptable uses of cyberspace. As users are guided to use cyberspace in an acceptable manner, further emphasising how internal security policies influence user security knowledge and awareness.

According to Ng (2010), security awareness training represents an effective approach for making users aware of the need for securing their environments. In this way, the author revealed that increased security awareness and training can improve an organisation's information security performance. Directly, this implies that security training positively influences employee knowledge and skill in regards to security management. An additional view by Roper, Fischer, and Grau (2006) added that employee performance is affected by three types of influences: environmental, skill and knowledge, and motivations and attitudes. Therefore, assessing how security training influences employee knowledge and skills, as well as attitudes and motivations, is crucial. An argument by Adomi (2011) further posited that information security best practices in higher education institutions, such as mandatory training, should be taken seriously, as they influence all user levels in higher education institutions. As such, the implemented policies should be critically evaluated to ensure increased efficiency in providing core education and community services.

4.7.1.2.2 Continuous Learning

The aspect of continuous learning was also indirectly emphasised in that, as security policies outline the acceptable uses of cyberspace, users are guided to continually improve on this knowledge, thereby enhancing their knowledge and awareness. With policies, standards, and best practices in place, a greater emphasis is placed on ensuring responsible use of cyberspace so as to facilitate learning and authorship. Furthermore, higher levels of awareness ensure higher education institutions are protected from cybercrime activities.

A different argument by Kanwar, Balasubramanian, and Carr (2019) claimed that continuous or lifelong learning is characterised by continual upskilling and reskilling in order to keep up with unexpected changes in industry and advances in technology. As such, this was viewed as an important component of sustainable development. In the context of security policies developed in higher education institutions, lifelong or continuous learning can thus be understood as the continual upskilling and reskilling of employees with appropriate skills matching the requirements of advanced technology. Security policies establish important knowledge facets in which employees must be competent so as to ensure they secure the resources and data within the institutions. In this regard, employee effectiveness in continual learning influences the achievement of the 2030 higher education vision and the overall cultivation of cyberspace culture. However, the inverse is also true in that, where employees have not fully developed continuous learning practices, this will likely to lead to vulnerabilities within the higher education institutions that can be exploited by malicious actors, and thus adversely influence attaining the QNV 2030 in higher education. For instance, where security policies require employees to constantly change their passwords, some employees may fail to continually learn new approaches to enhance their passwords, thus making it easier for attackers to steal data and resources in the institutions. Directly, this leads to the failure to achieve the higher education 2030 vision or the cultivation of a positive cyberspace culture.

4.7.1.2.3 Attitudes and Behaviour

According to Adomi (2011), information security policies determine the efficiency in providing core education and community services in higher education institutions. A further finding by Lim *et al*. (2009) identified a relationship between organisation culture and the information security culture developed in an organisation. As such, it is necessary to provide time to positively influence employee beliefs, values, and behaviour. The implication is that the adopted security policies influence employee knowledge and security awareness as well as the attitudes and behaviour they develop towards fostering cyberspace culture. Continuing, the argument by Adomi (2011), which cited that policies influence employee efficiency in providing core services, further implies that they influence the level of security awareness and security competency among employees. As such, a need arises to evaluate the two aspects in the context of cyberspace culture. Furthermore, since policies affect employees' knowledge and skill level, this additionally influences their attitudes and behaviour towards cyberspace culture.

The argument advanced in this context is that the formulated and adopted security policies influence the organisational culture of higher education institutions. For instance, policies ensuring resource protection may require employees to restrict their use of computers solely to designated work roles or to avoid bringing their own devices into the workplace. Such policies influence the employees' attitudes and behaviour, which may be either positive or negative. In the event that negative attitudes are developed towards security policies, this adversely influences the attainment of the higher education QNV 2030, as the employees fail to support them. This further leads to the inability to foster a positive cyberspace culture as employees develop negative attitudes towards the policies. In a different study, Chedid *et al.* (2019) additionally reported that some positive behaviours, such as collaboration and knowledge-sharing in higher education institutions, are influenced by positive attitudes such as trust. As such, this suggests that security policies may foster negative attitudes among employees, in turn leading to negative behaviours that may fail to support the attainment of the QNV 2030 in higher education and the achievement of a positive cyberspace culture.

4.7.1.3 Security Technical Competency and Best Practices

Security technical competency and best practices are also important in guiding learning and authorship in cyberspace.

4.7.1.3.1 Skills and Knowledge

The information security culture framework (Shabbaan, 2014) further stipulates a need for technical competency and, as such, recommends benchmarking, training, and implementation of information security controls within organisations. In the proposed cyberspace culture framework (Figure 4-7), two technical aspects are emphasised: 1) security and training and 2) awareness creation. The Researcher's motivation for focussing on these two aspects stems from the fact that learners who might be well versed with traditional learning approaches and textbook use in physical classrooms might experience a challenge when shifting to the virtual landscape. Similarly, educators familiar with traditional teaching and authorship tools might also experience similar adoption challenges. As such, training should be offered to ensure the actors can employ digital tools to effectively conduct learning, teaching, and authorship.

4.7.2 External Elements of the Cyberspace Culture Framework

External elements of the cyberspace culture framework (Figure 4-7) refer to the roles undertaken by the government, including the institution of appropriate national leadership and governance to

develop strategies and manage the higher education sector; external technical assistance to facilitate technology adoption; development of appropriate policies and best practices; providing government regulation to encourage growth of the culture; and reliance on theoretical perspectives, particularly levels and dimensions of culture.

4.7.2.1 The QNV 2030 Directive

The QNV 2030 directive influences government leadership, regulation, and information security policy. This section examines each of these aspects and details how they influence attaining the higher education QNV 2030.

4.7.2.1.1 Leadership

According to Walsh (2019), effective leaders empower their followers to take more risks, and thus to achieve greater goals. Leadership describes a process of social influence whereby an individual who is influential or more prototypical than other group members in a given context empowers other members to either attain particular goals or to solve particular problems. Therefore, in this regard, attaining the higher education QNV 2030 is heavily influenced by the effectiveness of the steering committee or leadership that governs it. As such, this section assesses how leadership strategies influence the attainment of the higher education QNV 2030. In particular, this section expounds on how economic factors and external pressure shape the different leadership strategies and, subsequently, influence the achievement of the higher education vision.

4.7.2.1.1.1 Economic Factors

The QNV 2030 directive focusses on enhancing the quality of higher education by encouraging the development of independent institutions to offer training for the population. However, as revealed by Marshall (2018), higher education institutions remain challenged by increased costs of acquiring and maintaining technology, as well as in running operations as expected without sacrificing the institutions' soul and affecting the quality of delivered services. The implication is that the QNV 2030's directive to develop independent institutions is likely to influence the development of alternative sources of income, such as alliances with organisations, technology transfer, distance education, and provision of auxiliary services. Strategies such as adopting distance education and technology transfer influence both the achievement of the higher education QNV 2030 (setup of independent higher education institutions) and fostering cyberspace culture through introducing technology-mediated learning. The argument advanced is that some strategies implemented in higher education institutions are influenced by economic factors, such as

partnership with tech organisations to supply equipment at an affordable price level due to financial constraints. In the same vein, the institutions may decide to adopt distance learning rather than establish physical classrooms. While these strategies will positively influence the attainment of the QNV 2030 in higher education (increasing the number of financially viable institutions), they may also affect the cultivation of cyberspace culture due to interaction with digital technologies.

4.7.2.1.1.2 External Pressure

Likewise, the QNV 2030 directive regarding the policies implemented in higher education may lead to external pressure that adversely affects the higher education institutions' flexibility. In this context, external pressure refers to either leadership or managerial pressure by government regulation leading to reduced flexibility. The government is considered a major stakeholder in higher education by offering funding and facilitating partnerships with foreign investors (Cantwell, Coate and King, 2018). In other instances, political interests by the government may influence the policies and strategies that are implemented, such as the institution of leadership. Therefore, assessing how government regulation influences external pressure is important. Furthermore, as government regulation influences the revenue generation activities of higher education institutions, such as the research programmes they offer or their income-generating activities, this further emphasises how government regulation influences economic aspects.

4.7.2.1.2 Information Security Policy and Regulation

The government's information security policy directive, as well as its imposed regulations, further influence the attainment of the higher education QNV 2030 by influencing three core aspects: compliance and advanced security, environmental uncertainty, and political factors, as discussed in the section below.

4.7.2.1.2.1 Compliance and Advanced Security

According to Ghazvini, Shukur, and Hood (2018), information security policies represent a major requirement in higher education institutions such as universities due to the large amount of computer power they possess. Similarly, given their open-access policy, this allows higher education institutions to provide access to their networking infrastructure to both internal staff and students, as well as to visitors and worldwide authors. According to Tømte *et al*. (2019), the digitalisation of higher education is highly important in modern society, as it enhances both learning and teaching processes. Additionally, higher education institutions are also highly

knowledge-intensive and rely on information communication technologies (ICTs) to store, process, and disseminate information. Based on such aspects, higher education institutions must comply with diverse security policies as directed by the government. Mumper *et al.* (2011) cited a college president who argued that the institution had to comply with security policies because the government required them to do so, and that failure to comply was tantamount to violation of the law:

> 'We have a gazillion people working on compliance. The government requires us to do it …. But if we don't have them, we would be in violation of the law' (Mumper *et al.*, 2011 p.132).

The implication of compliance is that the higher education institutions may be required to implement new technologies that positively or negatively influence attaining the higher education QNV 2030, as well as the cyberspace culture developed as a result. This assertion arises from the fact that information security policies address diverse advanced technological aspects such as data and application security, security incident management, and security auditing.

4.7.2.1.2.2 Environmental Uncertainty

Uncertainty can be understood as a state of doubt or uncertainty regarding what will happen in the future, such as receiving funding in the context of higher education. Kongolo (2019) reported that, in higher education institutions, managers often worry over changes to government policy, as well as other arrangements, such as compliance with the requirements of government organs. In the same vein, managers also have to deal with the uncertainty of their students, who may feel anxious or limited in regards to acquiring quality education in the institutions or obtaining work positions upon graduation (Skakni *et al.*, 2019). Furthermore, given the high and wide uptake of the Internet and advanced technology in higher education institutions, concerns of information security policies and regulation also lead to greater uncertainty in the institutions. One such case would be the institution of new leadership in the education ministry following a change of government. As new leadership is instituted in the government, changes are anticipated in regards to the management of higher education institutions.

Mok (2016) observed that, as leaders understand the important role played by higher education in their country's social and economic development, the government provides significant support to the institutions. However, as government leadership transitions from one political power to another, this generates uncertainty regarding the management environment of higher education, as

the institutions are left unsure as to whether the support by the previous regime will be continued in the new government. This assertion was supported by Pacheco, Yoong, and Lips (2020), who reported diverse challenges experienced in the transition of higher education management in terms of both leadership and acquisition of digital technology. Anticipated changes in both leadership and management styles of the newly instituted leaders are also poised to generate uncertainty regarding whether the higher education QNV 2030 is attained. In turn, this influences the cultivation of a positive cyberspace culture.

Second, it is also important to consider the uncertainty that arises from the rapid pace of technological development, which requires higher education institutions to adopt new operational processes, such as adopting modern technology in learning (Hartman, Townsend and Jackson, 2019). Studies have observed that higher education institutions tend to be slow in adopting innovation due to the associated risks and time commitments required to explore the new ideas and tools. Due to the pressure exerted by competition from other higher education institutions, some universities may be under pressure to adopt modern technology in order to meet the students' demands in the institutions (Hartman, Townsend and Jackson, 2019). However, this is challenged by uncertainty regarding whether educators in the institutions are positioned to utilise the technology or whether it is likely to be effective in attaining the targeted objectives. In other instances, government regulation may pressure the institutions to adopt modern technology, an aspect that also leads to the same effects. Whether caused by a change of political leadership or pressure to adopt modern technology in higher education institutions, the implication of environmental uncertainty is that it negatively influences the attainment of the higher education QNV 2030. Uncertainty regarding technology's effectiveness or the tenure of senior management also adversely affects the attainment of the QNV 2030 in higher education, as well as the cultivation of a positive cyberspace culture.

4.7.2.1.2.3 Political Factors

Political influences from the government can also affect the attainment of the higher education QNV 2030, particularly by influencing the appointment of governing boards. Adamu (2019) reported that, until recently, the university community in Ethiopia was not involved in either nominating or appointing their leaders, as this function was undertaken by the Ministry of Education. A similar observation was also made in Sweden, where at least four of the 11 members of the university governing council were appointed by the Ministry of Education while the

remaining members were elected by academic and administrative staff (Pinheiro *et al.*, 2019). As leaders play an integral role in directing team members in attaining goals and the organisation's overall vision, politically motivated strategies can eventually influence the attainment of the higher education QNV 2030. In turn, this subsequently affects the cultivation of the cyberspace culture.

Beyond appointing leaders, political influences from the government can also arise from the requirement to implement different policies, such as supporting technological adoption, which can likewise influence the attainment of the higher education vision. The argument advanced in this case is that, since the government represents a major stakeholder in higher education, such as by providing funding through loans or sponsoring different partnerships, it also plays an important role in influencing the decisions made in higher education, as well as the implemented strategies. The shortcoming of this aspect concerns the fact that the government may influence the implementation of politically motivated strategies in the institutions, such as procuring technological equipment from a given vendor. These strategies will subsequently influence the attainment of the QNV 2030 in higher education and further affect the cyberspace culture fostered within the period.

4.7.2.2 Technological Advancement

The advancement of technology can also affect attaining the higher education QNV 2030 by directly influencing two aspects: 1) learning and teaching and 2) the management of the institutions.

4.7.2.2.1 Learning and Teaching

As modern technology is adopted across nearly all sectors of the economy, this also leads to changes in how learning and teaching are undertaken in higher education. Technology-mediated collaborative learning, for instance, enables learners at different levels to solve problems and, in the process, to enhance their higher-level thinking skills and soft skills such as oral communication and social interaction (Esteves, Matias and Pereira, 2018). Additionally, through distance learning, learners can enjoy flexible learning processes, as studies can be undertaken regardless of their locations (Mahlangu, 2018). Two studies in particular emphasised technology's role in improving collaboration among learners, as well as in facilitating flexible distance learning. Meanwhile, other authors have highlighted technology's role in improving engagement levels among learners. For instance, Bond and Bedenlier (2019) revealed that student engagement in terms of cognitive,

affective, and behavioural aspects increased as students were provided the opportunity to voice their concerns in learning environments. In this context, technology enabled students to contribute to their learning environments and to offer feedback on different aspects, thus enhancing their engagement levels.

In regards to teaching and pedagogy, Oliveira *et al*. (2019) reported that technology is also enhancing current pedagogical approaches by facilitating aspects such as computer simulations, virtual labs, robots, and mobile devices. Allsop *et al*. (2020) shared similar findings, highlighting the use of video-conferencing to deliver anatomy teaching to medical students. The authors further revealed that technology-enhanced learning was invaluable for training students dispersed across multiple sites, as they were challenged in acquiring the training due to travel constraints. However, with video conferencing and the use of interactive screens, higher participation was observed among students.

Smart campus technology is also innovating learning within higher education by introducing smart education approaches, such as e-learning, virtual classrooms, and personalised learning (Sari, Ciptadi and Hardyanto, 2017). Likewise, Radio Frequency Identification (RFID) technologies are being leveraged to develop more interconnected campuses connected to outside entities in real-time. For instance, smart parking provides information regarding available spaces in parking lots, including when they are unavailable. Additionally, Internet of Things (IoT) technology is also transforming libraries into smart learning spaces, which are then subsequently converted into spaces of peer collaboration, social learning, and discourse (Chan and Chan, 2018). Smart libraries are equipped with modern technologies such as smart bookshelves that immediately update system records to ease stock take; automatically detect books on shelves, thus eliminating queues; and provide real-time tracking and monitoring of books. Nachandiya *et al.* (2018) further observed that intelligent campuses (i-campus) provide an interactive environment whereby diversified technologies such as cloud computing, mobile-based learning, mobile apps, and RFID support a wide range of functions, including learning, administration, and networking. Directly, this fosters the creation of environments wherein learners and teachers can interact with one another to enhance learning. Furthermore, pedagogy is also significantly improved, as teachers can utilise a wide range of teaching tools and equipment, such as information boards and data centres (Nachandiya *et al.*, 2018).

The implication of increased technology use is that the advanced technologies are fast-tracking the attainment of the higher education QNV 2030 by innovating both the teaching and learning processes. However, increased reliance on these technologies also influences the fostered culture as the learners interact with the technology. Therefore, it is important to not only evaluate how the advanced technologies are improving the attainment of the QNV 2030 in higher education, but also how this influences the cultivation of a cyberspace culture.

4.7.2.2.2 Management of Higher Education

Beyond this, advanced technology is also influencing the management of higher education institutions, such as by enhancing decision making through advanced data-driven approaches (Kurilovas, 2018). As the institutions generate significant amount of data, technologies such as artificial intelligence and data mining become highly useful for generating insights from the resultant large datasets. Several authors have accordingly demonstrated the impact of emerging technologies such as artificial intelligence and predictive analytics in generating important insights for managing higher education institutions. Jones (2019), for instance, reported that tracking, aggregating, and analysing profiles of students, along with their digital and analogue behaviour captured in their information systems, could promote learning mechanisms. Akçapınar, Altun, and Aşkar (2019) also demonstrated the use of learning analytics in developing early-warning systems for students at risk of dropping out of their classes. Such insights are useful for developing effective policies to ensure students complete their courses on time.

Continuing, information systems are also important for enhancing management operations by facilitating the creation, storage, and dissemination of diverse types of information (Singh, 2018). The direct implication of relying on advanced analytics to facilitate decision making in higher education is that this enhances attaining the QNV 2030 in higher education, as better strategies can be formulated from the generated insights. For instance, strategies to ensure students remain engaged during the learning process produces highly skilled graduates. Conversely, however, the increased reliance on analytical technology by higher education institutions' management also leads to a cultivation of a cyberspace culture. Examining technology's role in the management of higher education is highly important in this research, and the primary data-collection methods (interviews and focus groups) address this by collecting participants' views towards the same. As this research targets collecting data from senior management in higher education, this enables

understanding their perceptions regarding technology's role in the management of higher education.

4.7.2.3 Vision 2030

The QNV 2030 regarding higher education outlines long-term outcomes anticipated in the education sector, such as the modernisation of learning and increased emphasis on science and technology.

4.7.2.3.1 Implementation Framework

The 2030 vision highlights a roadmap to facilitate sustainable development in higher education as well as strategies such as investing in world-class scientific research and first-rate education in order to unlock the potential of its people. Therefore, the strategies outlined in the vision influence the fostering of cyberspace culture, as they can either enhance or hinder its attainment. As the QNV 2030 seeks to transform the country so as to facilitate sustainable development and improve living standards, it provides a guideline that influences the definition of country outcomes on a long-term basis and outlines a framework to facilitate the creation and implementation of national policies and plans (Qatar National Vision, 2030, 2008). Directly, this suggests that the framework is poised to influence the attainment of the higher education vision. For instance, guidelines in the QNV 2030 can be adopted in the higher education vision. Subsequently, a need to assess the value of the proposed cyberspace culture framework (Figure 4-7) is emphasised.

4.7.3 Theoretical Perspectives

In addition to the four core elements of the framework, theoretical perspectives on culture formation by Schein (1984) and Hofstede (1987) also play an important role in the development of a positive cyberspace culture.

4.7.3.1 Processes, Attitudes, and Values

First, Schein (1984) categorised culture along three levels of interaction: i) symbols and artefacts, ii) espoused values representing rules of conduct for the organisation, and iii) basic assumptions describing strongly embedded beliefs within the organisation that are considered a core element of culture. According to Schein (1984), culture is fostered as the three levels interact with one another; basic assumptions influence espoused values, which further influence the artefacts employed in organisations. Such perspectives are important for guiding leaders at different capacities to foster a positive culture in higher education institutions. Leaders guide their organisational members towards adopting positive behaviour and, eventually, fostering a positive

culture. The analysis of the different levels of culture by Schein (1984) highlights that culture manifests itself through visible processes, attitudes and behaviour, and values and beliefs. The different aspects are subsequently investigated in the research interviews in order to identify how they influence fostering cyberspace culture.

4.7.3.2 Cultural Dimensions

Hofstede's (1987) framework outlines five dimensions of culture: power distance, masculinity versus femininity, uncertainty avoidance, long-term orientation, and individualism versus collectivism. Hofstede's cultural model is important for identifying the type of culture prevalent among the population so as to guide leaders to leverage the population's cultural dimensions in fostering cyberspace culture. As Hofstede's cultural model outlines various dimensions of culture, understanding their influence on fostering cyberspace culture is emphasised in the research. For instance, where femininity is ranked lower than masculinity, strategies must be formulated to ensure equity in higher education institutions. Similarly, aspects such as power distance and the influence of individualism versus collectivism will significantly influence the nature of strategies adopted to foster cyberspace culture. Figure 4-7 below outlines the proposed framework:

4.7.4 Validation of the Cyberspace Culture Framework
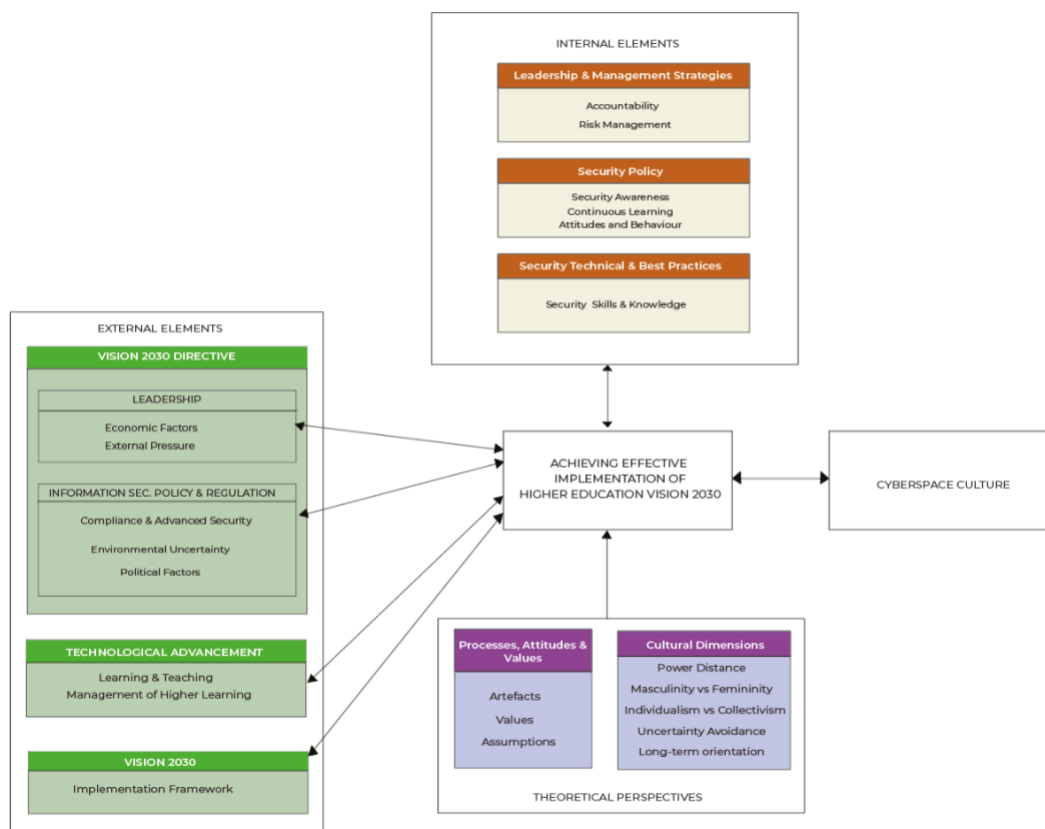
Figure 4-6:

Proposed cyberspace culture framework.

Source: The Researcher

Figure 4-7 above illustrates the cyberspace culture framework aligning the implementation of higher education vision to the cyberspace culture. The research framework (Figure 4-7) argues that attaining the higher education QNV 2030 is driven by three key elements: external aspects such as the QNV 2030 directives and advancements in technology, internal elements within higher education institutions, and theoretical perspectives governing the cultivation of culture. In turn, this is poised to foster cyberspace culture in higher education. Bi-directional arrows are employed to illustrate the interrelationship between the different variables, as each produces a commensurate influence on the other variable.

Internal elements include leadership and management strategies employed in the different higher education institutions, information security policies, and both security and technical best practices

formulated and implemented in the individual institutions. The internal elements are also observed to be interrelated with the QNV 2030's implementation in higher education using bi-directional arrows, indicating that each of the elements affects and is affected by the implementation. For instance, the internal leadership strategy adopted in an organisation influences the implementation of the higher education vision. Likewise, the overall higher education QNV 2030 further influences the nature of the adopted leadership strategies. Similarly, information security training and policies are expected to be formulated and updated by the leadership in the given institutions in alignment with the framework's implementation. The proposed cyberspace culture framework thus outlines important dimensions of information security, such as training, which can be considered by leadership in an effort to further enhance their policies. Beyond this, security and technical best practices unique to the organisation also display a bi-directional association with the QNV 2030's attainment.

External elements, such as the QNV 2030 directive in terms of leadership and information security policy and regulation, influence and are influenced by the QNV 2030's implementation in higher education. Furthermore, advancement in technology also affects strategy implementation by directly influencing teaching and learning activities, as well as the management of higher education. As the trend in higher education shifts towards adopting technology to enhance the various processes of learning, teaching, and management, most universities tend to formulate strategies around the new technology. As a result, strategy implementation is influenced by the available technology employed. Finally, the QNV 2030 also affects the implementation of the 2030 vision for higher education by virtue of its strategic plan and pillars (Figure 2-2).

However, the interaction between cyberspace culture and theoretical perspectives—namely, levels and dimensions of culture—remains unidirectional, as the concepts only influence the nature of cyberspace culture. Bi-directional arrows are employed between cyberspace culture and the achievement of the higher education vision, as the two concepts interrelate with one another. In conclusion, cyberspace culture is argued to both influence and be influenced by the QNV 2030's attainment. However, the relationship between cyberspace culture and various theories remains solely unidirectional, as the culture does not influence the theories' position.

Cyberspace essentially describes the virtual and non-physical world present between computers and allows individuals to develop new selves and share data with one another. Subsequently, as individuals interact with each other and the resources in the virtual realm, this fosters a pattern of

observable behaviour referred to as cyberspace culture. Cybersecurity, meanwhile, describes the protection of information and its critical elements, such as the systems and hardware that use, store, and transmit the information.

4.7.5 Contribution of the Cyberspace Culture Framework

The proposed framework contributes to attaining the higher education vision in several ways: First, it outlines the different internal and external elements involved in fostering positive cyberspace culture. These elements include leaders in different capacities across institutions of higher education, such as technical experts to offer training regarding the use of cyberspace technology to facilitate learning, teaching, and authorship; policy-makers to develop effective policies for minimising cyberspace insecurity and promoting best standards; the government as an oversight entity to facilitate the adoption of cyberspace culture; and finally, consultants and culture experts to enable institutions to adopt positive cyberspace culture.

Second, the framework argues that each of the highlighted elements significantly influence the development of cyberspace culture. As such, this implies that comprehensive analysis of each factor's influence on culture formation is required when implementing the framework. For instance, with the technical element, it will be important for institutions to map out all sorts of skills required by learners and educators, as well as the risk factors that could negatively influence the skills' development.

Third, by separating each framework component, this also facilitates easier evaluation of each element's contribution to the development of cyberspace culture and the commensurate attainment of the vision. For instance, evaluation procedures can examine leadership's influence on the progress made in attaining the vision and compare the results against the influence of policy, government regulation, and so on.

In addition to outlining the different contributions proposed by the cyberspace culture framework, it is also important to note that some elements have been drawn from other existent frameworks (refer to Table 4-3). For instance, the frameworks by Alnatheer and Nelson (2009), Shabbaan (2014), and Da Veiga and Elof (2010) all highlight the relevance of leadership and security culture in fostering positive culture. In the same vein, Shabbaan (2014) and Da Veiga and Elof (2010) also emphasised the importance of policy and technical competency. Nonetheless, some aspects that are unique in the proposed cyberspace culture framework include the identification of both internal

and external elements as influential elements in fostering cyberspace culture. Similarly, in the proposed framework, the impact of theoretical perspectives is also considered. These aspects form part of the unique contribution made by the Researcher.

4.8 Conclusion

The comprehensive review of various topical areas in the research revealed numerous significant findings. For instance, the review of various cultural theories (Schein and Hofstede) revealed important components required in culture formation (attitudes, beliefs, and artefacts), subsequently providing further insight into the requirements for developing the conceptual framework. However, in order to conceptualise the proposed cyberspace culture framework, the chapter also examined current information security frameworks. The critical evaluation of the different cyberspace culture frameworks indicated that, while cyberspace culture frameworks exist in numerous countries and organisations, none of them consider human participation. Proper training, education, and rewards or punishments established for employees can ensure that an organisation's cyberspace culture strategy is effectively implemented.

In response, the proposed framework (Figure 4-7) seeks to address current research gaps in delivering learning in cyberspace and empowering educators to use cyberspace technology to teach and develop content while ensuring their identities in cyberspace are not adversely affected. Additionally, the framework also strives to help researchers and leaders in higher education to visualise and comprehend how they can develop effective cyberspace culture in their own environments. Three core elements of the proposed framework (Figure 4-7) are outlined (theoretical underpinnings, external actors implementing the QNV 2030 directive, and internal actors involved in managing higher education institutions) in order to demonstrate the different kinds of elements required to implement the proposed framework. As a result, the roles of different elements are clearly set apart so as to minimise any possibility of overlap or confusion.

In the following chapter, the research methodology guiding the collection and analysis of primary data in this research is detailed. Furthermore, justification of the selected methodology is also provided in order to ensure the appropriate alternatives are implemented.

Chapter 5: Research Methodology

5.1 Introduction

Research methodology describes the science and philosophy behind a given research (Adams, Khan, and Raeside, 2014). This allows the researcher an in-depth understanding regarding the knowledge constraints and the different ways in which they can be created. Understanding how to construct the research methodology appropriately is also important for enabling the researcher to critically analyse the knowledge represented as fact. Therefore, a need arises to critically examine knowledge-creation processes so as to add value to society (Khan, 2008). Furthermore, as the researcher constructs the research methodology, diverse theoretical underpinnings are reviewed, issues pertaining to data collection and analysis are examined, and conclusions on the specific phenomenon under investigation are obtained.

Nevertheless, identifying the appropriate methodology for a given study can represent a daunting task, especially since this directly influences the credibility of the results. In the worst-case scenario, the chosen research methodology will fail to answer the research objectives identified at the onset of the research. However, to avoid such occurrences, the researcher can adopt the research onion framework to provide a structural guide for conducting the research work in a stepwise, logical, and analytical manner (Saunders *et al.*, 2009). An additional motivation for adopting this framework stems from the fact that it is widely accepted and deployed in the scientific community. The research onion is illustrated in Figure 5-1 below:
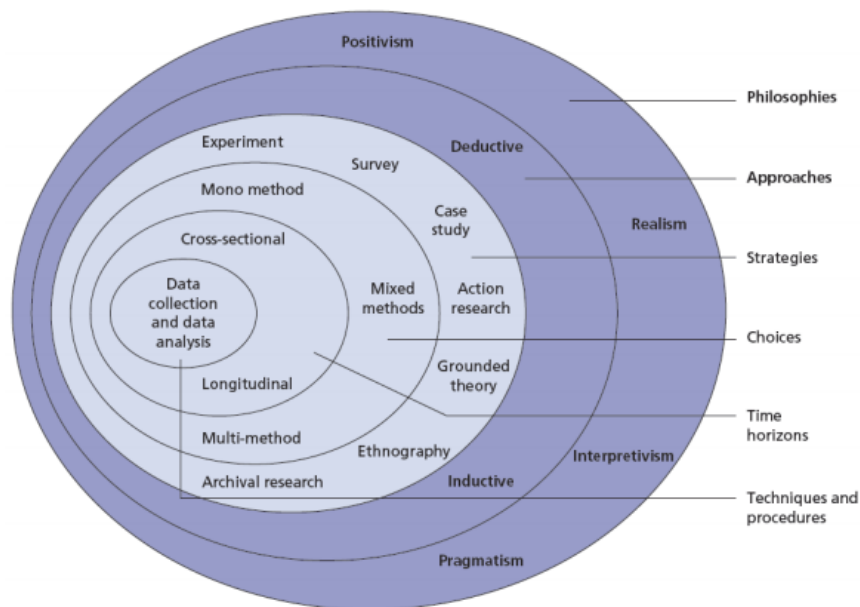
Figure 5-1: Research onion process.

Source: Saunders *et al*. (2009)

Justification for employing the research onion framework arises from the fact that it provides a stepwise approach to undertaking research similar to peeling an onion, which allows further details to be observed (Saunders *et al.*, 2009). At the outermost layer, the research philosophy is outlined, and gradually, research aspects such as approaches, strategies, choices, time horizons, and techniques are revealed. Accordingly, this chapter is structured based on the different layers of the framework.

Section 5.2 details the rationale behind the research philosophy while Section 5.3 discusses the research approach. In Section 5.4, the research strategy is described further while Section 5.5 elaborates on the research design. In Section 5.6, the data collection methods—namely, semi-structured interviews—are discussed in greater detail. In Section 5.7, data analysis techniques are elaborated further. Due to adopting qualitative collection techniques, thematic analysis represents the main analytical approach utilised. Section 5.8 discusses the various considerations of research quality, particularly the validity and reliability concerns. Finally, a conclusion section is added to summarise the main findings from within the chapter.

5.2 Interpretivist Research Philosophy

In selecting a research philosophy, the researcher adopts a belief regarding the procedure through which data for a given phenomenon should be gathered, analysed, and utilised (Kothari and Garg, 2016). Collins (2010) viewed this as a paradigm and, as such, argued that it acts as the lens through which authors view the world. Adopting the appropriate research philosophy is thus important in this research, as this enables the Researcher to develop assumptions regarding the world being studied as well as the various ways in which authors ought to understand it. Furthermore, as diverse assumptions can be made about the world, this subsequently leads to the emergence of diverse philosophies to support scientific inquiry.

In this research, the interpretive philosophy is utilised due to its ontology, epistemology, and axiology. Kumar (2008) emphasises that these three features distinguish a philosophy, with ontology describing the author's view regarding the reality under study, epistemology referring to the author's view concerning what pertains to acceptable knowledge, and axiology outlining the author's view as to the role of values in research.

The interpretivist philosophy is considered the opposite of the positivist paradigm, as the researcher adopts a subjective rather than objective view in conducting the research (Engel and Schutt, 2014). Furthermore, with the interpretivist paradigm, reality is constructed socially with the authors, focussing on the understanding that reality is shaped by people, unlike in the positivist case, where emphasis is directed towards reality without actors' input. Collins (2010) added that interpretivism is aligned with idealism—the view that meaning resides within the world independent of consciousness.

Interpretivism is justified in the present research, as it aligns with the Researcher's aim of comprehending the cyberspace culture as it is experienced by different actors involved in implementing the QNV 2030 in higher education. Furthermore, values play an important role in determining how actors behave in the different cyberspaces, as positive reinforcement contributes fosters positive culture whereas negative reinforcement leads to nefarious acts. As such, a subjective perspective helps the Researcher understand the reality under study. In the following section, the research approach adopted here is discussed. Justification for adopting the inductive rather than deductive option is likewise detailed.

5.3 Research Approach

As scientific research involves applying systematic techniques and procedures to facilitate the creation of knowledge, two main forms of reasoning are employed: deductive and inductive (Spaulding *et al.*, 2013). The current section examines these two approaches and provides justification for the selected alternative.

5.3.1 Inductive Research

Over the years, the examination of deductive and inductive reasoning by numerous authors has led to the emergence of various definitions of the concepts. On the one hand, Goswami (2011) compared the concepts on the basis that they involve drawing new conclusions from given information. For this reason, the Researcher conceptualised inductive reasoning as requiring individuals to transcend the given information and make references that may not be valid deductively, such as in drawing an analogy.

Glaser (2014), on the other hand, differentiated the concepts based on their root definitions of deduction and induction, respectively. This approach derived from Decoo (1996), who argued that their root definitions serve as the least common denominator of the terms. According to Decoo (1996), deduction essentially describes a process that moves from consciously generated rules to their application and language use or, in other words, from general to specific; meanwhile, induction implies the inverse, describing a process that moves from the particular to the general, or from language examples to the rules that govern them.

Subsequently, Glaser (2014) differentiated inductive and deductive reasoning based on the order in which each theory is encountered; inductive reasoning encounters examples before inferring the rules that control them while deductive reasoning concerns the presentation of rules before examples are encountered. Trochim *et al*. (2016) further resonated with this definition, though they defined the terms informally as the top-down deductive and bottom-up inductive approaches.

Figure 5-2 below further illustrates the bottom-up inductive reasoning approach, demonstrating the development of theory from observations:
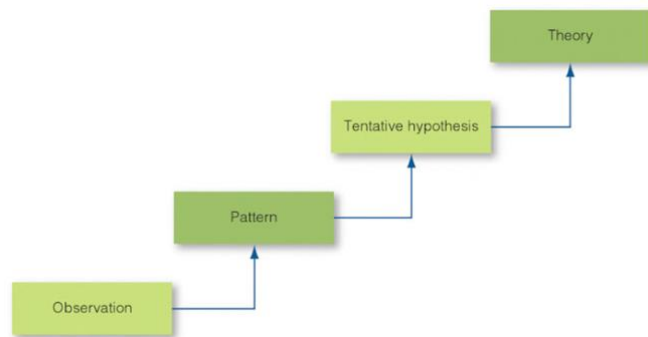
Figure 5-22: Bottom-up inductive research approach.

Source: Trochim *et al.* (2016)

In this research, the inductive approach is deemed appropriate for several underlying reasons: First, this research is exploratory in nature, as the focus resides on examining the different ways in which cyberspace culture shapes Qatar's 2030 higher educational vision. As such, this indicates that the Researcher should begin by interacting with specific observations, followed by identifying patterns and formulating tentative hypotheses before generalising theories that govern the relationships. Second, the goal of this research can only be attained after examining real-world observations, indicating that the deductive approach is not suitable, as it does not necessarily rely on real-world knowledge to reach conclusions. Third, the present research does not formulate any hypotheses to be tested through empirical observations, further justifying the inductive approach. The research strategy for data collection is discussed in the following section.

5.4 Research Strategy

The objective of a research strategy consists of outlining a general plan that will be employed to undertake the research work (Cresswell, 2007). In another study, Singh (2011) posits that the research strategy presents a formal plan to solve a problem by outlining research objectives and planned devices necessary to implement the strategy. In this research, two research strategies are adopted: semi-structured interviews and focus group discussions. In Sub-Section 5.4.1 below, the semi-structured interview strategy is discussed and justified regarding its use in the current research.

5.4.1 Semi-Structured Interviews

According to Wengraf (2011), semi-structured interviews differ from fully structured interviews in that they involve using open-ended questions and the subsequent development of follow-up questions that generate further evidence regarding a candidate's knowledge on a given asset. Smit

et al. (2008) further highlighted that, since a candidate's responses cannot be predicted in advance, the interviewer is required to improvise questions in alignment to the candidate's responses in order to gain an in-depth understanding of their knowledge. As such, this technique is more flexible than the conventional fully structured interview.

Given that this research seeks to investigate the strategic approach to cyberspace culture and how it aligns with the QNV 2030's strategic direction, semi-structured interviews were considered the most appropriate strategy, as they enable the Researcher to incorporate follow-up questions that facilitate extracting more knowledge from participants. In effect, this strategy helps the Researcher explore the problem area and gather as much data as possible regarding the selected topic. Second, semi-structured interviews were also chosen because this research is guided by the interpretivist philosophy, which emphasises collecting data from a small number of participants. Due to the reduced size of the research population, it was deemed necessary to employ a strategy that extracts as much data as possible from the participants. To facilitate this collection, semi-structured interviews represent the most appropriate option.

However, to conduct interviews, a researcher is still required to prepare standard questions that guide the interview process, similar to the fully structured interviews (Mitchell and Jolley, 2013). Wengraf (2011) added that semi-structured interviews will nonetheless require more preparation, as they incorporate follow-up questions. Similarly, greater creativity and discipline levels are required of the researcher in order to improvise the responses provided by a candidate. However, the author can be challenged in interpreting the responses due to the incorporation of follow-up questions (Edwards and Holland, 2013).

In this research, the Researcher was interested in interviewing diverse stakeholders directly involved in developing or implementing the QNV 2030 in higher education. As the stakeholders are drawn from different sectors, the semi-structured interview technique was appropriate for gaining an in-depth understanding of their perceptions regarding how cyberspace culture influences the vision's attainment. Creative use of follow-up questions further enabled the Researcher to gain deeper insights regarding the underlying factors that are likely to challenge attaining the vision.

5.4.2 Focus Group Discussions

Focus group discussions refer to unique qualitative research methods involving the discussion of a specific set of issues among a pre-determined group of people (Hennink, 2007). Such groups are comprised of 8–10 members who are knowledgeable about a certain topic or issue (Edmunds, 2001). However, adding more than 10 individuals per group lowers its efficiency, as interactions become difficult to control. Krueger and Casey (2015), though, argued that the number can range from as few as four to as many as 12 individuals. The decision of the group's size nonetheless lies with the author, albeit with the guideline that the group's size must be small enough to allow individuals to interact with one another while simultaneously being large enough to provide a wide range of perspectives.

Hennink (2007) posited that a focus group's core purpose is to provide a wide range of views concerning a given topic as well as to facilitate a deeper understanding of the highlighted issues from the individuals' perspectives. Subsequently, when organising focus group discussions, care must be taken to ensure that the appropriate group size is selected and that all individuals involved depict a certain level of homogeneity or similarity (Stewart *et al.*, 2007). The similarity aspect is employed as a basis of recruitment whereby only individuals who meet certain pre-determined criteria can be involved in the discussions. For instance, the recruitment criteria can be broadly defined on aspects such as age or gender. Alternatively, they can be defined narrowly, such as being restricted to individuals who participated in a given programme (Krueger and Casey, 2015). Therefore, a researcher needs to be aware that, under most circumstances, the focus group brings together individuals who do not know each other.

Justification for selecting focus group discussions stems from the fact that they provide qualitative data due to their exploratory nature (Edmunds, 2001). In this research, the Researcher established several focus groups comprising stakeholders drawn from different organisations directly or indirectly involved in implementing the QNV 2030 in higher education. Some of these include individuals in the Ministry of Transport and Communication (MOTC), stakeholders and management of higher education institutions, and government policy-makers. Additionally, utilising focus groups complements the results obtained from semi-structured interviews, where other important perspectives can be generated.

Despite the wide range of advantages associated with adopting focus groups, such as multiplicity of views, spontaneity of responses, and their ability to facilitate further clarification while also allowing the identification of new issues, a researcher is expected to exercise caution when conducting such discussions due to several limitations (Fern, 2001). Specifically, Hennink (2007) identified three highly problematic limitations: First, the Researcher must demonstrate adequate moderation skills so as to eliminate bias in selecting participants. Second, group dynamics may generate unprecedented issues and, as a result, adversely affect the discussions' effectiveness (Edmunds, 2001). For instance, some participants might be too dominating whereas others might shy from engaging in discussions. In other instances, hierarchies may develop, leading to agreement rather than engagement among participants. Third, issues might arise in the data analysis, especially where large textual information is generated (Stewart *et al.*, 2007).

As this section has elaborated on the use of focus groups and semi-structured interviews to collect primary data, the following section discusses the research design effectively adopted.

5.5 Research Design

According to Myers *et al*. (2010), adopting an appropriate research design is important in research, as this helps combine the study elements logically and coherently so as to address formulated research questions. In this regard, the adopted research design presents a blueprint that guides data collection, assessment, and evaluation (Gorard, 2013). The implication of selecting the wrong design is that this can lead to weak and unconvincing conclusions whereas appropriate research designs guarantee that the conclusions are valid and trustworthy (Anastas, 2012). As a result, the Researcher is tasked with identifying the philosophical assumptions, outlining the research method, identifying techniques for collecting and analysing data, and providing a summary of the research findings in order to align empirical findings with the research questions. In the present research, a three-stage process was adopted for developing the research design. Figure 5-3 illustrates the research design employed in the current research:
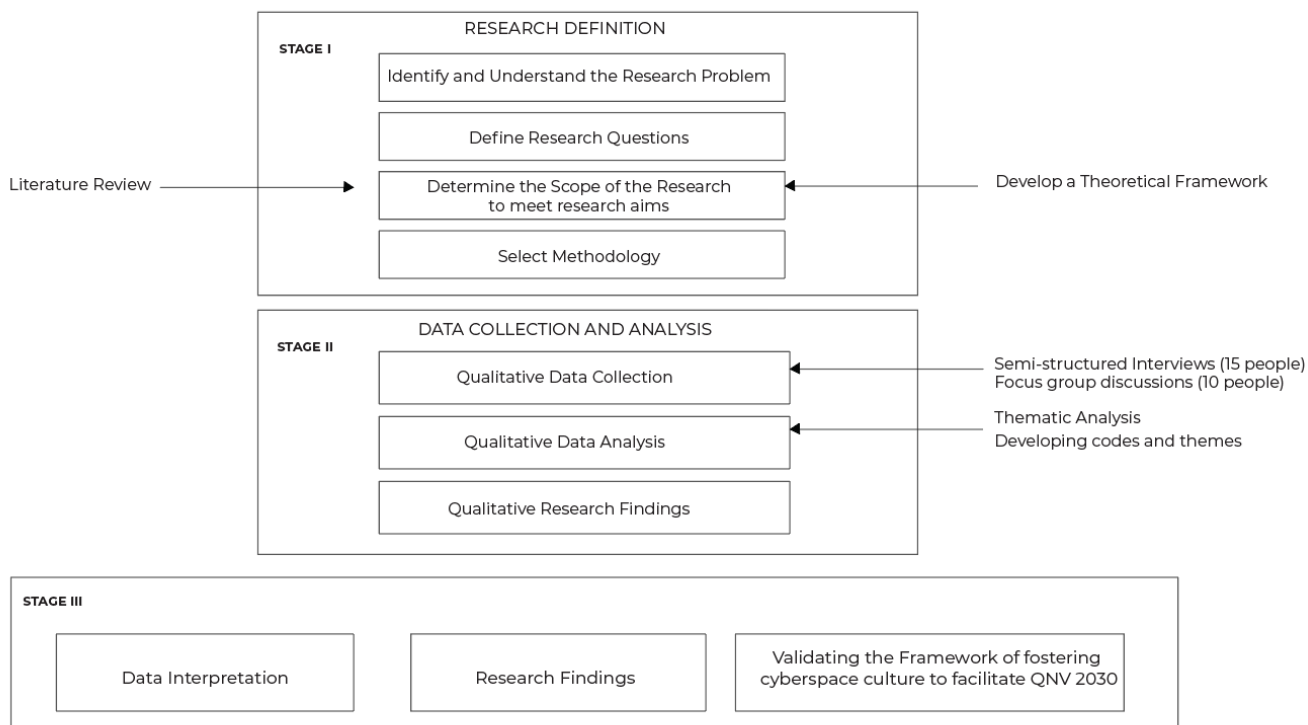
Figure 5-3: Sequential research design adopted.

Source: The Researcher

As presented in Figure 5-4 above, the research design begins with the problem-identification phase followed by a comprehensive review of cyberspace culture literature with the goal of examining prevalent research gaps. The identified research gaps provide a basis for developing the theoretical framework aligning cyberspace culture to the QNV 2030 in higher education. Stage one concludes with the identification of a suitable research methodology. In stage two, the Researcher emphasises qualitative data collection and analysis using thematic analysis procedures. Finally, in stage three, the empirical data are combined with secondary literature findings and validation of the developed framework undertaken in the context of the cyberspace culture alignment with the QNV 2030. Additionally, the Researcher also focusses on answering the research questions by combining the primary and secondary data. The individual elements of the research design (research process and sample composition) are further discussed in the following sub-sections.

5.5.1 Research Process

This sub-section discusses the research processes adopted in this research. To begin, the desk research is expounded, followed by a discussion of the field research process in the second section.

5.5.1.1 Desk Research

The goal of the desk research was to identify a theoretical foundation facilitating the development of a framework to align cyberspace culture with the QNV 2030 in higher education, as illustrated in Chapter 4. However, a prerequisite for developing the framework involved conducting an in-depth evaluation of literature on cyberspace culture (Chapter 2) and identifying current literature gaps (Chapter 3). To this end, the Researcher examined diverse literature sources ranging from books and journal articles to conference papers, case studies, and industry reports in order to gain a better understanding of cyberspace culture and how it influences attaining the QNV 2030 in higher education.

The four-quadrant framework (Althonayan, 2003) was employed in the literature evaluation chapter (Chapter 3) to facilitate identifying research gaps. The framework divided the research philosophy into visionary and implementational and the outcomes into descriptive and prescriptive (see Chapter 3, Tables 3-1 and 3-2). Chapter 3 concluded that few studies focussed on the implementation of cyberspace culture in different contexts. In particular, the Researcher identified a lack of cyberspace culture frameworks in the context of Qatar and the implementation of its QNV 2030. As a result, a need was identified to develop a framework that addressed such research gaps. The literature examined in Chapter 2 was further classified under the four framework quadrants: implementational-prescriptive (see Table 3-2). As a result, the Researcher was able to easily identify quadrants where significant work had been undertaken, thus eliminating the need for further work, as well as quadrants possessing a limited number of studies, thus indicating a need for further research. Beyond this, the classification further confirmed a need to develop a framework to facilitate implementing cyberspace culture in Qatar's context. Objectives of desk research included the following:

1. To identify core academic- and industry-based literature on cyberspace culture.
2. To establish and elaborate on current literature gaps.
3. To develop a theoretical foundation to facilitate the development of a framework to address prevalent research gaps.
4. To enhance subject knowledge on different thematic areas on cyberspace culture.

Desk research is important, as it facilitates the development of the proposed framework, and so addresses the different identified research gaps in addition to providing recommendations for both academia and the higher education sector in Qatar.

5.5.1.2 Field Research

As this research focusses on developing a framework aligning cyberspace culture to the QNV 2030 in higher education, the qualitative research approach was deemed appropriate. With qualitative research, the Researcher could interact with important stakeholders involved in both developing and implementing the QNV 2030. The utilised data sources are listed in the following:

1. Primary research data sources:

    1.1 Qualitative research

    - Semi-structured interviews with stakeholders from the Ministry of Transport and Communication (MOTC), government policy-makers, and senior practitioners in the higher education sector in Qatar.

    - Focus groups with senior practitioners in the Ministry of Transport and Communication (MOTC) and Qatar's government and higher education sector.

2. Secondary research data sources:

    2.1 Literature review

The objectives of field research (refer to Section 1.5) included the following:

1. To evaluate current cyberspace cultures' alignment with strategic vision.
2. To evaluate the various current frameworks regarding cyberspace culture and identify their strengths and weaknesses.
3. To analyse the current strategic approach to cyberspace culture and its alignment with the country's strategic directions.
4. To analyse the Qatar Vision, 2030 cyberspace strategy and how it is influenced by the attainment of the 2030 higher education vision.

5.5.2 Sample Composition

This sub-section discusses the adopted sampling procedures and the composition of the research sample utilised in the semi-structured interviews. As the research is qualitative in nature, it is associated with smaller sample sizes, unlike the quantitative research approach, which involves large random samples (Daymon and Holloway, 2011). Silverman (2010) further argued that, since

the validity of qualitative analysis depends more on the quality of the analysis rather than the sample size, qualitative studies are typically composed of small sampling sizes studied in depth.

The emphasis on smaller sample sizes indicates that the considered research population is homogeneous in nature (Shi, 2008). Creswell (2012) also justified the use of a homogeneous study population in a qualitative study by highlighting that this ensures the author can understand the underlying problem at a deeper level. Three sampling strategies are associated with qualitative research: convenience sampling, snowball sampling, and purposive sampling (Macnee and McCabe, 2008). The present research utilises the purposive sampling technique, which involves the intentional selection of participants based on predetermined criteria, such as specialist knowledge and capacity to take part in the research (Jupp, 2009). In this regard, this technique only considers participants who are involved in the development or implementation of Qatar's 2030 vision for higher education. Specialist knowledge and position held in different institutions represent some of the key factors considered in the selection criteria. The alternative snowballing and convenience sampling techniques, by contrast, were not adopted due to their misalignment with the research objectives. For instance, convenience sampling was rejected due to solely focussing on participants who meet pre-determined selection criteria and are readily available to participate. As such, this technique was critiqued for producing poor data quality that would lack intellectual credibility. The snowball sampling technique was also rejected for utilising individuals who are known and recommended by the current research participants.

Trochim *et al*. (2016) further classified sampling techniques into two types: probability and non-probability. With probability sampling, the members of the population possess a known, equal chance of being included in the research sample, whereas with the non-probability case, their inclusion in the research depends on the researcher's judgment (Babbie, 2015). The present research utilises the non-probability sampling technique, as the Researcher is only interested in participants who display certain knowledge and who work in a predetermined environment.

Two qualitative techniques were employed to collect data in the present research: semi-structured interviews and focus group discussions. Initially, the Researcher planned to collect data from 15 interviews and two focus groups comprising five members each. However, with the Covid-19

pandemic, the research plan was adjusted due to social distancing directives by the World Health Organisation (WHO), meaning that physical one-on-one meetings could not take place. As a result, the Researcher increased the interviews to 18 in order to leverage online teleconferencing technology and reduced the focus group to only one comprising six members. The Researcher was also able to conduct the focus group before the WHO social distancing directive. However, for the interviews, only eight had been conducted on a one-on-one basis. As a result, 10 interviews had to be conducted via Microsoft Online Call. The semi-structured interviews were conducted with senior practitioners drawn from higher education institutions, MOTC, and regulatory organisations in Qatar. The Researcher considered respondents from different professional backgrounds in order to increase the robustness and validity of the findings. The second stage involved facilitating the focus group discussion, comprising six senior practitioners.

An additional consideration when determining sample sizes involved data saturation, an aspect in which no new data that emerge can be considered important for developing theory or achieving the research's agenda (Daymon and Holloway, 2011). The Researcher accordingly ensured that the sample size is neither so small that it does not achieve data saturation nor so large that the Researcher would be unable to capture the responses of individuals in the research sample. As such, a total of 24 participants were accordingly identified to provide the qualitative data (18 for the interviews, six focus group). In the following section, the considerations made regarding data collection are detailed further.

5.6 Data Collection Strategy

This section discusses the processes undertaken to prepare and undertake the interviews and focus groups.

5.6.1 Semi-Structured Interviews

Interviewing has been described as the most reactive data-collection method, as it involves asking people questions to which they provide answers (Bernard *et al.*, 2017). Three types of interviews exist: unstructured, semi-structured, and structured (Bernsen and Dybkjær, 2010). In this sub-section, the different interviews are elaborated further and justification is provided for the adoption of semi-structured interviews in this research.

To begin, Myers and Shaw (2004) described unstructured interviews as lacking a formal agenda or fixed time limit. As a result, both parties are provided with freedom and opportunities to develop relevant issues. Leavy (2014) added that, since they lack a pre-set structure, the interviewer cannot prepare for such interviews beforehand, instead remaining a passive listener throughout the period. While such interviews sound like casual conversations, however, they require the interviewer to be highly disciplined in order to recall issues mentioned by the interviewee (Bernard *et al.*, 2017). The authors added that, despite providing a significant wealth of information, they remain challenged by the fact that the provided information can turn out to be insignificant for the research.

Structured interviews, meanwhile, closely resemble questionnaires that are delivered aloud on a face-to-face basis (Myers and Shaw, 2004). Here, the interviewer asks the respondent a given number of questions in the sequential order in which they appear in a printed form. Additionally, little conversation occurs between the interviewee and interviewer except when making clarifications (Bernsen and Dybkjær, 2010). Such interviews are appropriate when the researcher's interest is to make cross comparisons among groups of participants who answer identical questions. However, Leavy (2014) argued that such researchers are disadvantaged by not leveraging the dialogical potentials for knowledge production associated with human conversation.

The semi-structured interview combines features from both structured and unstructured interviews (Myers and Shaw, 2004). The interviewer (the Researcher) follows a guideline of set questions when conducting the interview and is also allowed some measure of freedom to ask follow-up questions during the interview. The interviewer (the Researcher) is also flexible and can modify the coverage of topics and details regarding how topics are covered (Bernard *et al.*, 2017). As the researcher is thus able to discover new knowledge aspects during the interview process, this was deemed appropriate for the current research. As such, semi-structured interviews were chosen, as they allow greater flexibility in collecting data.

The Researcher sought to interview respondents on a face-to-face basis, utilising telephone interviews when such meetings were impossible to establish. Data from the interviews were

recorded in audio tapes and later transcribed to extract individual responses (Smith *et al.*, 2008). However, as advised by Bernsen and Dybkjær (2010), the Researcher also took additional notes during the interview so as to reduce the time taken in analysing transcripts.

5.6.1.1 Design of the Interviews

The interview questions employed in this research were developed based on key research themes highlighted in the literature review:

- Challenges in cyberspace culture;
- Alignment of cyberspace culture to the higher education QNV 2030;
- Gaps in cyberspace culture and the higher education QNV 2030; and
- Alignment of proposed framework to the higher education QNV 2030.

The research interview comprised nine open-ended questions that were sub-divided into the following framework-aligned categories: 1) external elements, 2) internal elements, 3) theoretical perspectives, and 4) testing the bi-directional relationship between the attainment of the higher education QNV 2030 and cyberspace culture. The questions were adopted from the developed conceptual framework, which described the problem based on the four aspects above. The four categories were adopted from the developed conceptual framework in Figure 4-7.

Follow-up questions were also added so as to gain a deeper understanding regarding the various research themes. Each interview lasted from 30 minutes up to one hour and was divided into three sub-parts.

The first part involved establishing the participants' demographic profiles so as to ensure they possessed sufficient knowledge to provide the required data. However, since the purposive sampling strategy was employed to recruit the research participants, some of the details regarding their work positions had already been established.

The second part centred on identifying respondents' perspectives concerning cyberspace culture and its contribution to the QNV 2030 in higher education. The goals of this sub-section included 1) establishing the depth of understanding regarding how cyberspace culture influences attaining

the QNV 2030 in higher education, 2) identifying organisations' critical success factors that affected alignment between the two, and 3) understanding the challenges faced in fostering cyberspace culture.

The third part focussed specifically on the strategic framework aligning cyberspace culture to the attainment of the QNV 2030 in higher education. To this end, questions investigated potential challenges and limitations likely to be encountered during the implementation as well as various solutions to the problems.

5.6.1.2 Selection of Interviewees

Initially, the Researcher targeted 15 participants for the semi-structured interviews. However, due to the Covid-19 pandemic, the Researcher increased the number to 18, as one focus group was impossible to undertake. The 18 participants were drawn from Qatar's Ministry of Transport and Communication (MOTC), higher education institutions, and regulatory organisations. The Researcher obtained the participants through existent networks in research academia as well as by directly contacting the MOTC to recruit additional participants. However, it is worth noting that only six interviews were conducted before the Covid-19 pandemic reached full effect. As a result, there was free interaction between the different senior practitioners and the Researcher without the restrictions of social distancing. The interviews were conducted in two phases whereby the first six participants were interviewed on a one-on-one basis before the Covid-19 pandemic took hold in March 2020. Thereafter, 12 interviews were conducted in 2020 through electronic means (utilising video-conferencing technology) due to the Covid-19 pandemic.

The participants were further grouped into clusters whereby the research dealt with participants in terms of groups as opposed to an individual basis. The clusters were selected based on the organisational structures of the targeted companies and included 1) a strategy team and 2) a technical team. However, the Researcher remained aware that management and leadership teams might be similar in some organisations. Different themes in the interviews were also outlined based on the cyberspace culture framework and included 1) external elements, 2) internal elements, 3) theoretical perspectives, and 4) the bi-directional relationship between the attainment of the higher education QNV 2030 and cyberspace culture.

5.6.2 Focus Group Discussions

This section discusses the organisation of the focus groups as well as the processes employed to select respondents.

5.6.2.1 Design of Focus Group Discussions

In order to ensure consistency, the Researcher utilised the same questions developed for the semi-structured interviews in the focus group discussions. Refer to Sub-Section 5.6.1.1 to view the thematic areas that were considered. However, as argued by Breen (2006), several factors have to be considered in establishing focus group discussions due to their differences from semi-structured interviews. Table 5-1 below summarises the differences between the two:

Table 5-1: Differences between focus groups and one-on-one interviews.

Construct	One-on-one interview	Focus group discussions
Aim	Probe experience	Idea generation
Researcher's role	Interviewer	Moderator
Sample sizes	Target to reach saturation <12	Target to reach saturation 4–6 per group
Equipment used	Audio-recording devices, quiet room	Audio-recording devices, quiet room, props (e.g. flash cards)

Source: Breen (2006)

First, the Researcher was required to play the role of moderator rather than interviewer. As such, it was necessary to undertake further research to prepare for the new role. Second, due to the respondents' differing work schedules, the Researcher had to contact the participants via email at least 3–4 weeks in advance and to share the focus group discussion questions in order to allow them adequate time to prepare for the discussions (Stewart *et al.*, 2007). Third, in order to manage the focus groups effectively, the Researcher divided the participants into two five-member groups and scheduled discussions on different dates. A private board-room was also outsourced to facilitate discussions in a round-table manner. Props such as leaflets and flash cards containing the research questions were prepared in advance in an effort to ensure the respondents did not stray from the breadth of the topic.

Conducting a pilot study was also important for gauging the respondents' understanding of the interview questions, revising the questions' structure by either adding or deleting some elements, and facilitating evaluation of the new moderator role's effectiveness. To that end, three participants were selected for a mock focus group discussion. The Researcher also focussed on assessing the process in which the focus groups were conducted. Oates and Alevizou (2018) summarised the focus group process in six definite steps, presented in Figure 5-5 below:
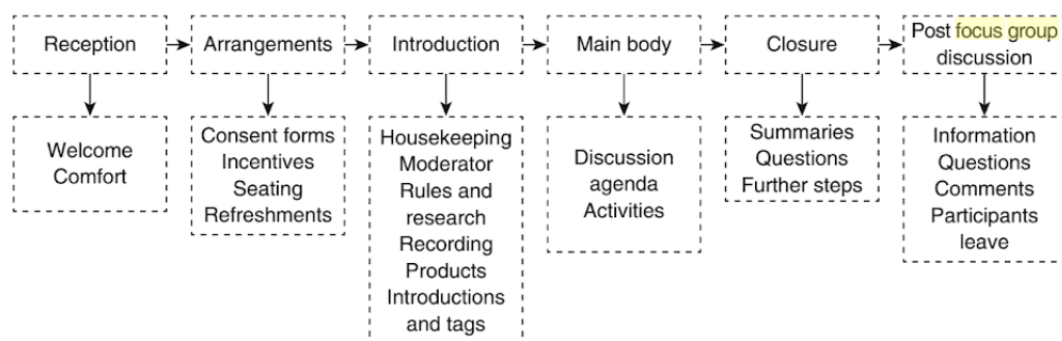
Figure 5-4: Focus group process.
Source: Oates and Alevizou (2018)

Similarly, through the pilot study, the Researcher was able to assess the respondents' comfort levels as the discussions progressed from the introductory phase to the main discussion and the end of the discussions. Multiple audio-recording devices were utilised in order to eliminate risk of failure (Stewart *et al.*, 2007).

5.6.2.2 Selection of Respondents

The focus group discussions involved only six senior practitioners drawn from Qatar's MOTC, higher education institutions, and regulatory organisations. To facilitate the discussions, the participants were organised into one group comprising six members. It is worth noting, however, that the focus group discussion was conducted before the Covid-19 pandemic had been in full effect. This allowed free interaction between the different senior practitioners and the Researcher without the restrictions of social distancing. The 10th question in the interviews was discussed by participants in the focus group. The following section reviews the procedures utilised to analyse the collected data.

5.7 Qualitative Data Analysis

Data collected from the semi-structured interviews were saved in audio format and thereafter transcribed into text. It is important to emphasise that, although the use of technology proved beneficial in facilitating interviews during the Covid-19 pandemic, it was considered a limitation in qualitative data collection due to hindering the Researcher from observing other subtleties among the participants, such as their body language and tone. Therefore, to obtain research insights, the Researcher relied solely on the analysis of the specific words employed by participants and the various themes that were discussed. In an ideal scenario where face-to-face interviews would be undertaken, the researcher would analyse both the words used by participants and their body language as well as the tone in their speech. However, due to the limitations of technology, such aspects were not considered in the analysis.

In order to analyse the responses, thematic analysis, which essentially describes a process of encoding qualitative information, was employed (Boyatzis, 2009). At its most basic level, thematic analysis enables identifying patterns or themes from a qualitative dataset, and thereafter to derive meaning and value from them (Smith and Sparkes, 2016). Justification for adopting thematic analysis in this research stems from the fact that the Researcher organised the data from semi-structured interviews into several research themes (see Sub-Section 5.6.1.1). As a result, thematic analysis would facilitate encoding the information into useful insights.

Smith and Sparkes (2016) summarised the thematic analysis process in six phases, which can be further simplified into three steps. Figure 5-6 below summarises the six phases of thematic analysis:
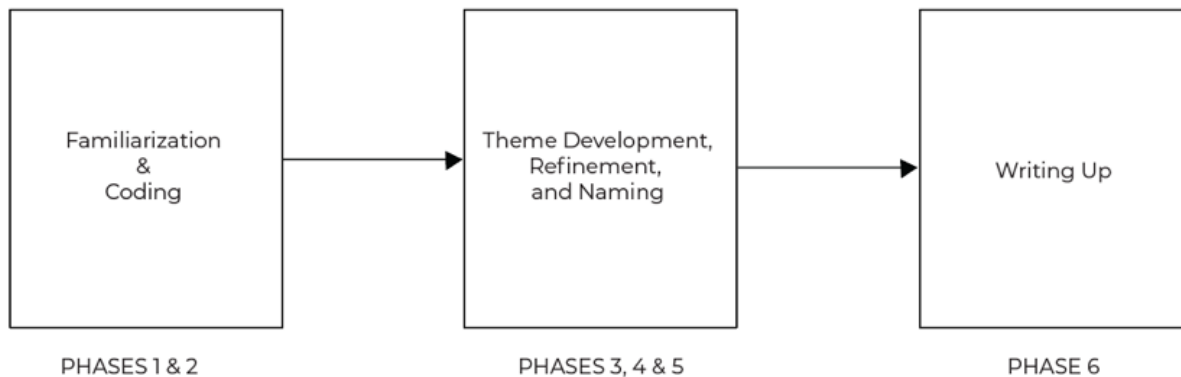
Figure 5-6: Thematic analysis phases.

Adopted from: Smith and Sparkes (2016)

In the first and second phases, a researcher can gain familiarity with the data by reading it over and over and making notes on interesting aspects that emerge. During the coding phase, important aspects of potential relevance to the research are highlighted, such as by using a computer programme. Smith and Sparkes (2016) argued that no definite stopping point exists for coding, and the researcher can add as many codes as deemed appropriate to capture the analytical aspects of the data. In the third, fourth, and fifth steps, the researcher organises the generated codes into themes and reviews them, thus developing a rich analysis of the data that captures the finalised themes. As a result, three main themes are highlighted by the Researcher: overarching themes that capture the general idea, themes that organise a concept, and sub-themes that capture a given facet of the concept. The final phase involves compiling the findings into a comprehensive report. In the following section, concerns for research quality (validity and reliability) are addressed.

5.8 Research Quality

As this research is largely qualitative in nature, it remains subject to scrutiny, since the Researcher's subjectivity and interpretations influence the obtained results. Subsequently, it is necessary to ensure the findings' reliability and validity. In this section, the Researcher accordingly discusses the standards adopted to ensure the research data remained reliable and valid.

5.8.1 Reliability

Baumgarten (2012) defined reliability as both the consistency associated with the measurement of a given concept by utilising an identical measurement procedure as well as the findings' replicability. Krippendorff (2004) further added that reliable data describe that which remains

constant throughout the variations of the measuring process. Two types of reliability are associated with data: internal reliability, which focusses on the consistency of indicators employed in the research and is specified by a correlation value between them; and external reliability, which outlines whether data can be generalised beyond the context of the research (Baumgarten, 2012).

Quantitative research studies that rely on the positivist philosophies easily evaluate data reliability using statistical procedures such as test-retest for stability estimates and Cronbach's Alpha for internal reliability (Mertens, 2005). Noble and Smith (2015), however, argued that reliability can also be achieved in qualitative research by making several considerations, such as demonstrating clear decision trails to ensure consistent interpretations. Each participant in a study should also be selected using similar parameters and consistent lines of questioning. As this research is qualitative in nature, reliability was ensured by adopting a dependable process whereby interviews and focus groups were conducted in a systematic manner. Each of the interviewees was asked the same questions, and all focus group participants were allowed sufficient time to respond to the asked question. Furthermore, non-probability sampling was utilised whereby only participants who met the pre-determined criteria (working in higher education and involved in implementing QNV 2030) were considered. This ensured that the research could be replicated at a later period by future researchers who would adopt a similar process to obtain similar results. In the same vein, reliability was also assured by virtue of the fact that the findings could be confirmed through previous literature studies. This aspect is further described in Chapter 7, wherein the findings from the primary data collection are compared against the previous literature review. As the primary findings corroborated the previously reviewed literature, this emphasises its trustworthiness and truthfulness.

5.8.2 Validity

Validity, meanwhile, concerns truths and cannot be tested through duplications, unlike reliability, which relies on the agreement of results in subsequent duplicates (Krippendorff, 2004). Thyer (2010) added that validity emphasises the findings' accuracy, and in qualitative research, it addresses data credibility. The researcher further highlighted three broad categories under which validity is classified: reactivity, which focusses on the distorting effects arising due to the researcher's presence in the field; research bias; and respondent bias.

In order to ensure validity in qualitative research, Noble and Smith (2015) recommended for the researcher to account for any personal bias that could have influenced the findings, acknowledge any existent bias in sampling, and engage with other researchers to reduce bias. In the present research, the Researcher ensured validity by accounting for the different forms of likely bias and soliciting the participants' views regarding the credibility of the findings and their interpretation. Second, the research was also considered valid and credible as established methods of data collection—namely, focus groups and interviews—were appropriate for addressing the formulated research questions. Third, further evaluation of the methodology also revealed that sampling was appropriate for addressing the research objectives, as the research participants were selected by a purposive sampling technique whereby only professionals who worked in higher education and were involved in implementing vision 2030 were selected. As such, this improved the findings' accuracy, as the participants were directly involved in the particular thematic areas of focus for the research. Additionally, utilising thematic analysis to extract insights from the collected data also further emphasised the validity and trustworthiness of the findings. As this section has indicated how the research quality is achieved here, the following section discusses ethical considerations emphasised in this research.

5.9 Research Ethics

In order to ensure research is conducted in an ethical and accepted fashion, several aspects are considered. To begin, since qualitative approaches are employed to collect data by interviewing different participants, it is important to ensure that the selected respondents take part in the research on a voluntary basis and without coercion (David and Sutton, 2009). For this reason, the researcher must prepare an introductory letter to seek consent from the various participants and to provide a detailed explanation regarding how the data obtained will be secured and utilised. This also confirms that the data gathered from the participants are purely for research basis and that the Researcher will not use it in other ways. Participants were required to sign the letter as confirmation of agreement to provide their data. However, they were also free to decline to take part.

Second, it is also imperative for a researcher to ensure privacy and confidentiality of the collected data (Groves *et al.*, 2009). To this end, pseudonyms such as #participant1 can be adopted to identify respondents. The data should also be stored in a confidential and secure manner and should

not be shared with other third parties without the respondents' consent. To this end, the researcher must strive to store all audio and text-based documentation from respondents in secure drives, safe from any damage or theft.

5.10 Summary

This chapter presented the research methodology guiding this research. Subsequently, theoretical and analytical underpinnings were elaborated in detail as well. An interpretivist philosophy was deemed appropriate for this research, as it aligns with the Researcher's goal of comprehending cyberspace culture as it is experienced by different actors involved in implementing the QNV 2030 in higher education. Inductive reasoning was also adopted, thus indicating that the Researcher would begin by interacting with specific observations, followed by identifying patterns and formulating tentative hypotheses before generalising theories that govern the relationships.

Data were collected using the qualitative approach by conducting focus group discussions and semi-structured interviews. However, in order to ensure validity and reliability of the collected data, the Researcher avoided randomisation of the samples and instead emphasised purposive non-probability sampling, wherein only participants who meet predefined criteria are selected for the research. In Chapter 6, the collected qualitative data are presented for further analysis.

Chapter 6: Primary Data Collection and Analysis

6.1 Introduction

This chapter presents the research findings obtained from conducting interviews and focus groups with the goal of contextualising the validity of the proposed cyberspace culture framework (Figure 4-7). To investigate the effectiveness of aligning the implementation of the 2030 higher education vision with the cultivation of cyberspace culture, this chapter analyses the research findings using a qualitative analysis technique as guided by the research objectives detailed in Section 1.5. Although qualitative analysis comprised the dominant technique employed to draw insights from the primary data, the Researcher also utilised content analysis, which includes a descriptive analysis of the findings. Descriptive statistics were employed to evaluate the particulars of the interviews and focus groups, including demographic details such as gender, work positions, and organisational sectors where participants worked. Thereafter, thematic analysis was undertaken to evaluate the findings thematically, with further interpretation undertaken in Chapter 7, where the research questions are addressed. Regarding the chapter's structure, Section 6.2 reiterates the data collection and analysis strategies employed in this research. In Sections 6.3 and 6.4, the particulars of the interviews and focus groups are presented using descriptive analysis. Section 6.5, which comprises the bulk of the chapter, presents the findings from the thematic analysis while Section 6.6 concludes the chapter.

6.2 Data Collection and Analysis Strategies

In this section, the strategies employed to collect and analyse the data are detailed. However, since the strategies were discussed comprehensively in the methodology chapter (Chapter 5), in this section, the Researcher only emphasises key points that were identified as opposed to duplicating the content. The objective of outlining semi-structured interviews and focus group discussions is to provide clarity regarding the procedures employed to collect and analyse the research data before detailing the findings that were obtained.

6.2.1 Data-Collection Strategy

As detailed previously in Section 5.6, the Researcher adopted two data-collection strategies: semi-structured interviews and a focus group. For the semi-structured interviews, the Researcher prepared a guideline of nine open-ended questions in alignment with the thematic areas highlighted in the proposed cyberspace culture framework (Sub-Section 5.6.1.1). Interviewee selection was further accomplished using a purposive sampling technique (Sub-Section 5.6.1.2) whereby 18

participants were drawn from Qatar's Ministry of Transport and Communication (MOTC), higher education institutions, and regulatory organisations. The interviews were conducted using two primary techniques: face to face and via online calls using the Microsoft Team Online Calls application.

Furthermore, for the focus group (Sub-Section 5.6.2), the Researcher acted as a moderator of a group of six participants drawn from the same organisations where only one question was considered (Sub-Section 5.6.2.2). However, unlike the semi-structured interviews, guiding questions were not prepared. This is because the goal of the focus group was to evaluate the proposed cyberspace culture framework's effectiveness (Figure 4-7) in facilitating the attainment of the higher education 2030 vision and the achievement of a cyberspace culture.

6.2.2 Data Analysis Strategy

As revealed in Section 5.7, qualitative analysis represented the main procedure employed for the assessment of the data. In this section, the procedure is described further.

According to Elo *et al.* (2014), qualitative content analysis, as a research method, represents a systematic and objective approach to describing and quantifying phenomena. As such, the authors claimed that, in order to undertake content analysis successfully, raw data must be reduced to concepts that describe the research phenomena by creating categories, concepts, models, or conceptual systems. Hsieh and Shannon (2005) further posited that, rather than comprising a single method employed to draw important insights from text data, qualitative content analysis can be sub-divided into three approaches: conventional, summative, and directed. The authors further highlighted that the key difference between them stems from their coding schemes, code origins, and threats of trustworthiness. However, additional differences were highlighted by Pietiläinen *et al.* (2017): On the one hand, with the conventional analysis approach, coding categories are derived from the raw data during analysis; on the other hand, directed content analysis develops coding categories from prior theories or relevant research findings (Oh, 2018). The summative content analysis involves counting and comparing keywords or content, followed by interpretation of the underlying context.

This research adopts the directed content analysis approach whereby coding categories are derived from the proposed cyberspace culture framework. Therefore, the Researcher did not focus on generating codes and themes from the collected raw data. Instead, the various components of the developed cyberspace culture framework were employed to organise the raw data into themes and categories. The justification for considering the directed content analysis approach stems from the fact that the Researcher designed interviews and the focus group under the guidance of the proposed cyberspace culture framework. As a result, this helps identify coding categories and themes employed in the data analysis.

Erlingsson and Brysiewicz (2017) reiterated this claim, observing that, although the starting point for qualitative content analysis features transcribed interview text, the objective of the analysis consists of transforming the verbatim-transcribed interviews into a concise summary of abstracted key results. Figure 6-1 below outlines the overview process of the stepwise qualitative content analysis adopted in this research:
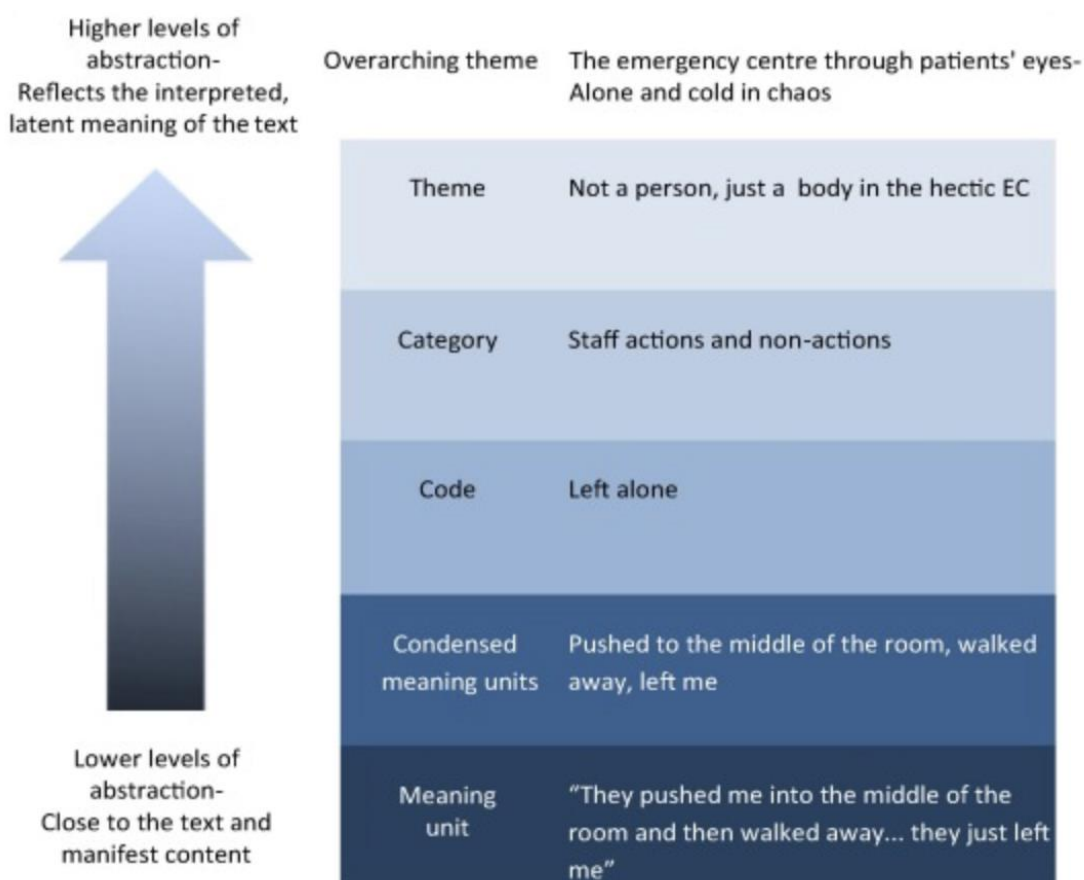
Figure 6-1: Synopsis of the adopted qualitative content analysis approach.

Source: Erlingsson and Brysiewicz (2017)

As outlined in Figure 6-1, the analysis strategy in this research involves four activities: 1) condensing the transcribed text into shorter sentences; 2) developing codes, comprising labels that are one or two words long; 3) developing categories for group-related codes through either content or context; and 4) developing themes expressing the latent or underlying meaning communicated to the reader. Nonetheless, due to the extensive nature of the collected data, for this research, the Researcher employed NVivo 12—a qualitative data analysis software application that enhances processing and analysing the findings. It is worth noting, however, that this research primarily collected qualitative data by conducting interviews and moderating a focus group. Accordingly, the quantitative results presented in this chapter arose from analysing the qualitative data and were only incorporated to support the interview findings. For instance, several graphical charts were generated to display the distribution of responses. However, as the data were only collected at one point in time, this was considered cross-sectional in nature (Siegel 2012).

Furthermore, as reported by Zamawe (2015), computer-assisted qualitative data analysis software (CAQDAS) has emerged as a popular solution to lessen the burden of undertaking qualitative research projects due to their labour-intensive and time-consuming nature. While diverse CAQDAS applications are readily available, such as ATLAS, MAXqda, NVivo, and Q6, the Researcher adopted Nvivo 12 due to its wide-scale adoption in the scientific community and its robust functions, such as character-based coding, rich text capabilities, and multimedia functions (Edwards-Jones, 2014). This application enabled the Researcher to condense the transcribed text into smaller sentences and to identify codes or labels for the transcribed text. However, as argued by Zamawe (2015), qualitative analysis software only aids the analysis process; it does not analyse the data. As such, the researcher must maintain control of the analysis process. In this context, it was important that the Researcher determine the various categories and themes to facilitate data interpretation.

A total of 18 interviews and one focus group comprising six members were undertaken to provide the required data. The Researcher initially planned to collect the data over a period of only one

month (4 weeks). However, with the Covid-19 pandemic, this was increased to two months (6–8 weeks) due to the difficulty of accessing the respondents. Interview responses provided data for the first three themes while the focus group responses provided input for the fourth theme. The various themes adopted in this research are outlined as follows:

1. Theme 1: Influence of external elements on the attainment of the QNV 2030 in higher education (Sub-Section 4.7.2).
2. Theme 2: Influence of internal elements on the attainment of the QNV 2030 in higher education (Sub-Section 4.7.1).
3. Theme 3: Influence of theoretical perspectives on the attainment of the QNV 2030 in higher education (Sub-Section 4.7.3).
4. Theme 4: Effectiveness of the proposed cyberspace culture framework in aligning cyberspace culture with the higher education QNV 2030 (Sub-Section 4.7.4).

6.3 Interview Particulars

To ensure validity and reliability of the findings—as discussed in Chapter 5, Sub-Sections 5.8.1 and 5.8.2—purposive sampling was utilised whereby only select participants were considered to take part in the interviews based on their knowledge of the research topic. The participants included senior staff members working in Qatar's MOTC, higher education institutions, and other government regulatory organisations. The Researcher categorised the interviewees into two core groups—strategy and technical—based on the fact that the proposed cyberspace culture framework (Figure 4-7) generally detailed these aspects. The grouping also arose from the nature of the participants' roles and the departments in which they worked in the different organisations, as some were in strategy while others resided in technically-oriented positions. Eight of the targeted interviews were conducted face to face (before the COVID-19 pandemic) where the Researcher interacted with the interviewees in person. However, due to the COVID-19 disruption and the resultant social distancing requirements outlined by the World Health Organisation (WHO), the remaining 10 interviews were conducted via Microsoft Team online calls. Table 6-1 illustrates some of the interview particulars. Refer to Appendix B for the full particular details.

Table 6-1: Particulars of the interviews.

No.	Respondent code	Duration	Words	Interviewee roles
1	Respondent 1	29:27	3019	Dean
2	Respondent 2	42:34	4492	VP
3	Respondent 3	46:39	6632	Manager
4	Respondent 4	49:30	3392	VP
5	Respondent 5	25:48	3939	Director
6	Respondent 6	31:00	4646	Associate Vice President
7	Respondent 7	20:04	2736	Undersecretary
8	Respondent 8	22:18	2792	Director
9	Respondent 9	30:40	3908	Manager
10	Respondent 10	19:00	1895	Manager
11	Respondent 11	28:51	2659	President
12	Respondent 12	17:30	2303	Section Head
13	Respondent 13	27:59	3633	Teaching Assistant
14	Respondent 14	44:21	6009	Director
15	Respondent 15	43:47	6587	Director
16	Respondent 16	25:05	3154	Section Head
17	Respondent 17	17:48	2358	Director
18	Respondent 18	10:27	1425	Associate Vice President
Total 18 Interviews		Duration: 532.48 min [8 hrs, 14 min, 58 sec]		

| | Total words: 65,579 |
| | 10 online calls, eight face-to-face interviews |

Source: The Researcher

6.3.1 Interview Demographic Data

The analysis of participants' geographical details revealed that all participants were drawn from Qatar and worked in Qatari-based organisations. This subsequently suggested that they were knowledgeable regarding current issues affecting local organisations.

6.3.1.1 Gender

First, the participants' gender was examined, as detailed in Figure 6-2:
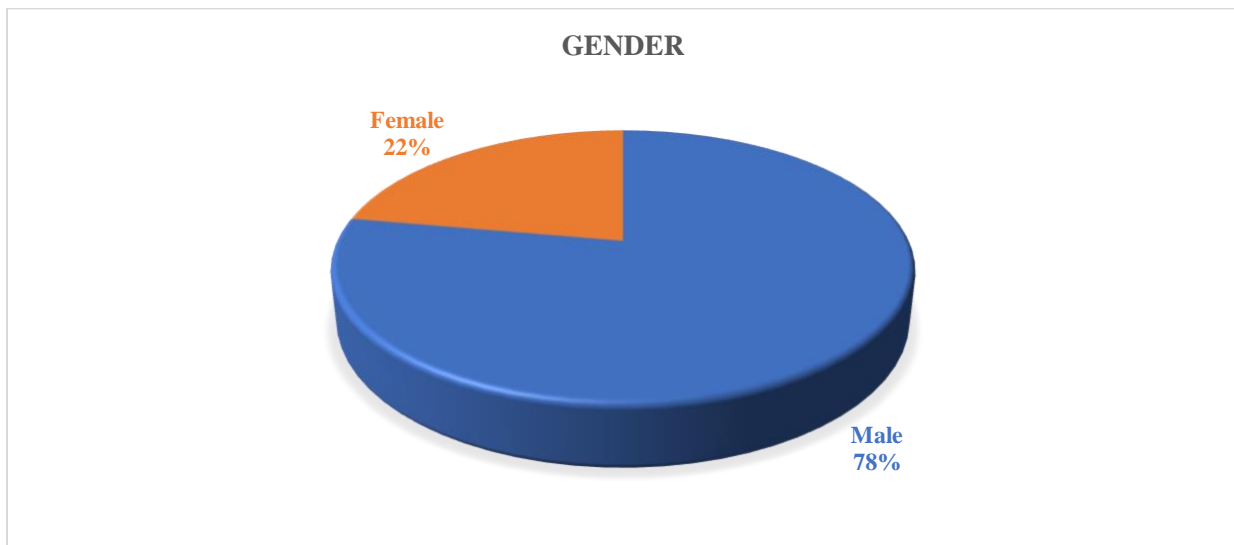
Figure 6-2: Gender of participants.

Source: The Researcher

The findings indicate that there were more male (77.8%) than female (22.2%) participants in the research. This suggests that senior positions in higher education and the regulatory sector in Qatar are male-dominated.

6.3.1.2 Nationality

Next, the participants' nationality was assessed, as detailed in Figure 6-3:
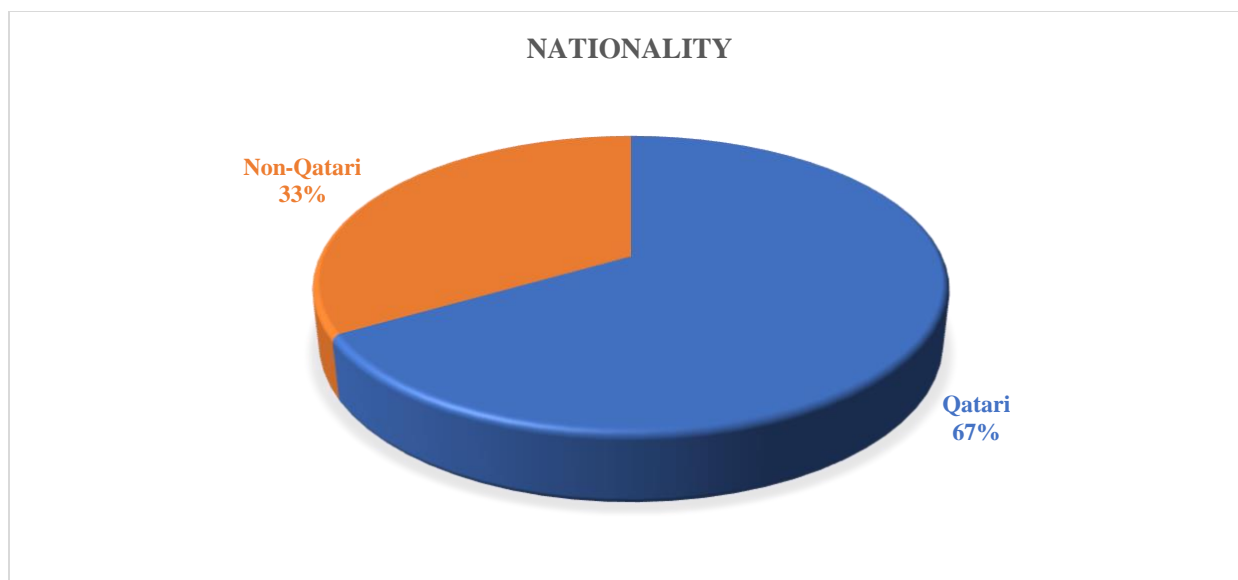
Figure 6-3: Nationality of participants.

Source: The Researcher

All participants worked in organisations based in Qatar and were conversant with the various aspects in the scope of the research. However, according to the analysis of the findings in Figure 6-3, there were more Qatari nationals (66.7%) compared to non-Qataris (33.3%). The existence of non-Qatari nationals among the interview participants further suggests that senior roles in higher education and regulatory organisations are occupied by professionals from different countries.

6.3.1.3 Job Categories

The participants' job categories were also evaluated, as detailed in Figure 6-4:
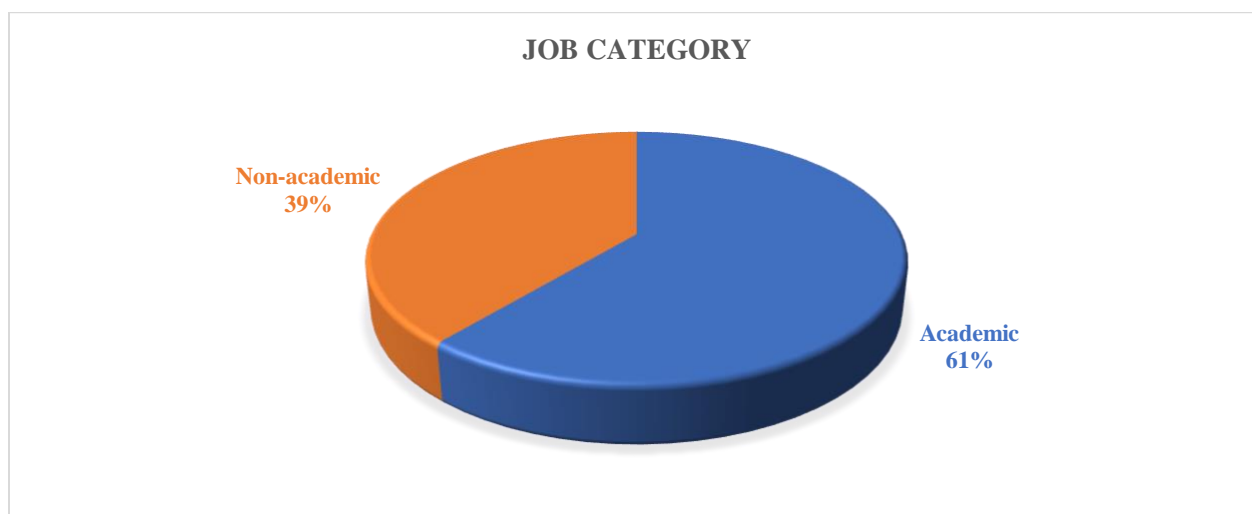
Figure 6-4: Job category of participants.

Source: The Researcher

The findings indicate that the majority of the participants were from academic institutions (higher education; 61%) as compared to non-academic ones (regulatory; 39%). The findings also suggest that the participants were knowledgeable regarding the various issues that challenged the cultivation of cyberspace culture in higher education.

6.3.1.4 Organisational Sector

Further evaluation of the participants' data also revealed the different types of organisations in which the respondents worked. Figure 6-5 illustrates the distribution of work organisations:
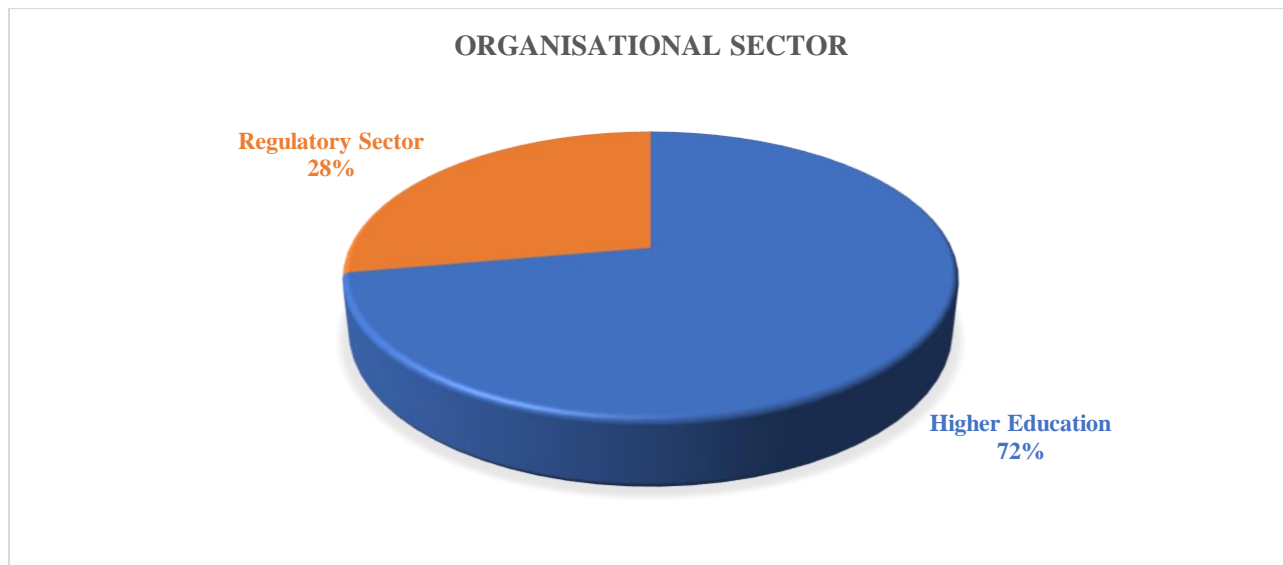
Figure 6-5: Organisational sectors of the participants.

Source: The Researcher

According to the results, 13 participants worked in higher education (72%) whereas five participants worked in regulatory organisations (28%). The implication is that most of the respondents could identify the issues faced in Qatari higher education. However, the additional members from the regulatory industry provided important insights into the role that regulation oversight plays in achieving the higher education QNV 2030. Furthermore, as the organisational sectors undertake different activities and face various opportunities and challenges, the Researcher

was able to collect diverse perspectives regarding the issues that would affect implementing the QNV 2030 in higher education.

6.3.1.5 Respondents' Professional Roles

Third, the Researcher was also interested in identifying the participants' professional experience and their actual responsibilities in the different organisations. Figure 6-6 illustrates these professional roles:
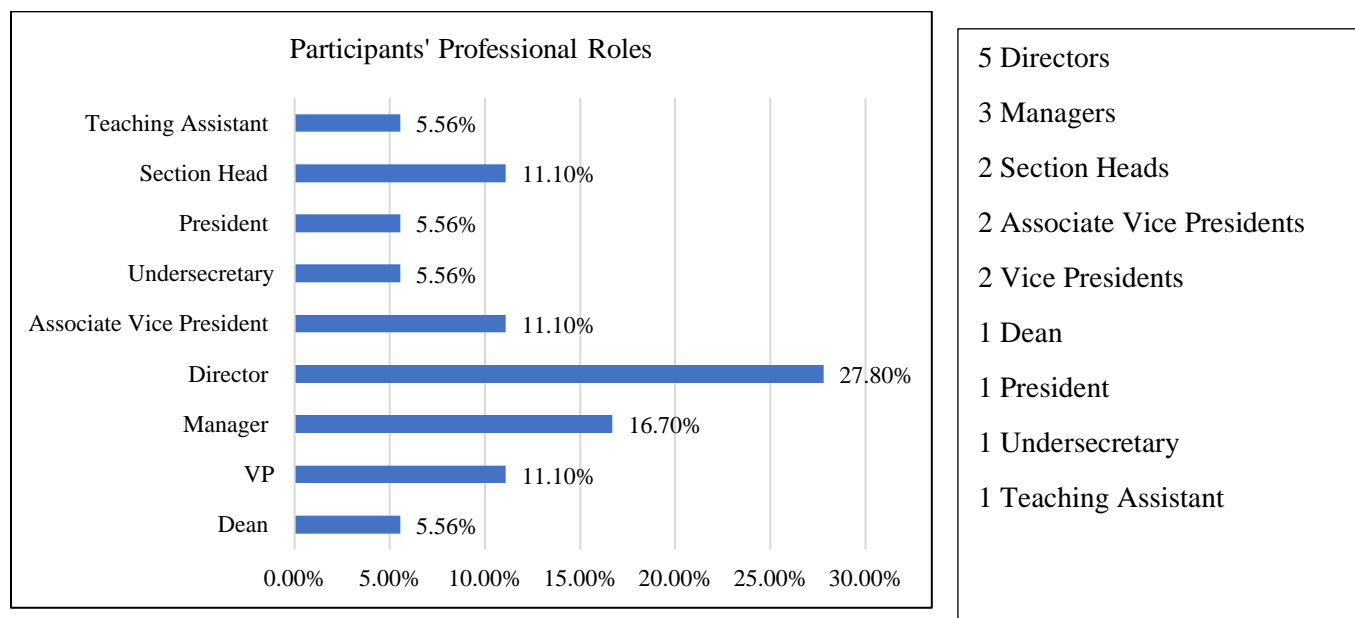
Figure 6-6: Professional roles of the participants.

Source: The Researcher

Based on the findings from Figure 6-6, all participants held senior roles in their organisations. The majority consisted of directors (27.8%), followed by managers (16.7%), vice presidents (11.1%), associate vice presidents (11.1%), and section heads (11.1%). Fewer participants held the highest senior roles, such as president (5.6%) and dean (5.6%), as well as minor roles, such as teaching assistants (5.6%) and undersecretaries (5.6%).

6.3.1.6 Respondents' Professional Experience

As disparity was identified regarding the participants' professional roles, which further suggested that they served in different operational capacities and were thus knowledgeable regarding different aspects that would affect the QNV 2030's implementation. The Researcher accordingly

investigated the key operations of each participant (either technical or strategy), as detailed in Figure 6-7:
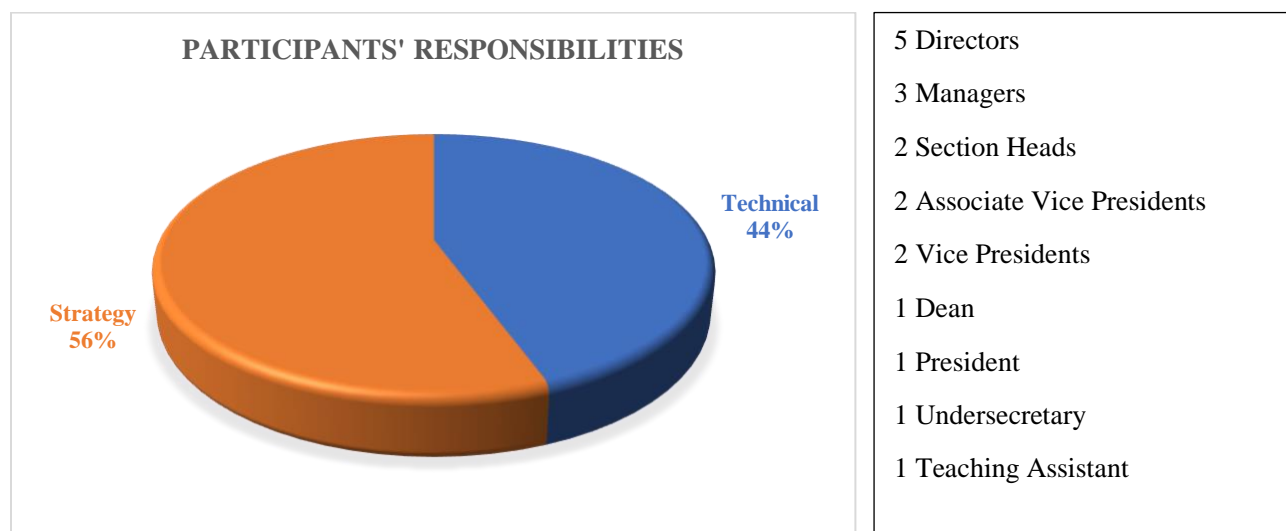
Figure 6-7: Professional responsibilities of interview participants.

Source: The Researcher

The findings from Figure 6-7 indicate that the majority of participants (55.6%) handled strategy operations while 44.4% undertook technical responsibilities. A plausible explanation for the high number of participants in strategy operations stems from the high number of senior staff members reported in Figure 6-6, such as managers, directors, and vice presidents.

6.3.1.7 Respondents' Work Experience

Additionally, to ensure legitimacy and validity of the provided responses, the Researcher also investigated participants' work experience in terms of years worked in the same professional role. Figure 6-8 displays the findings:
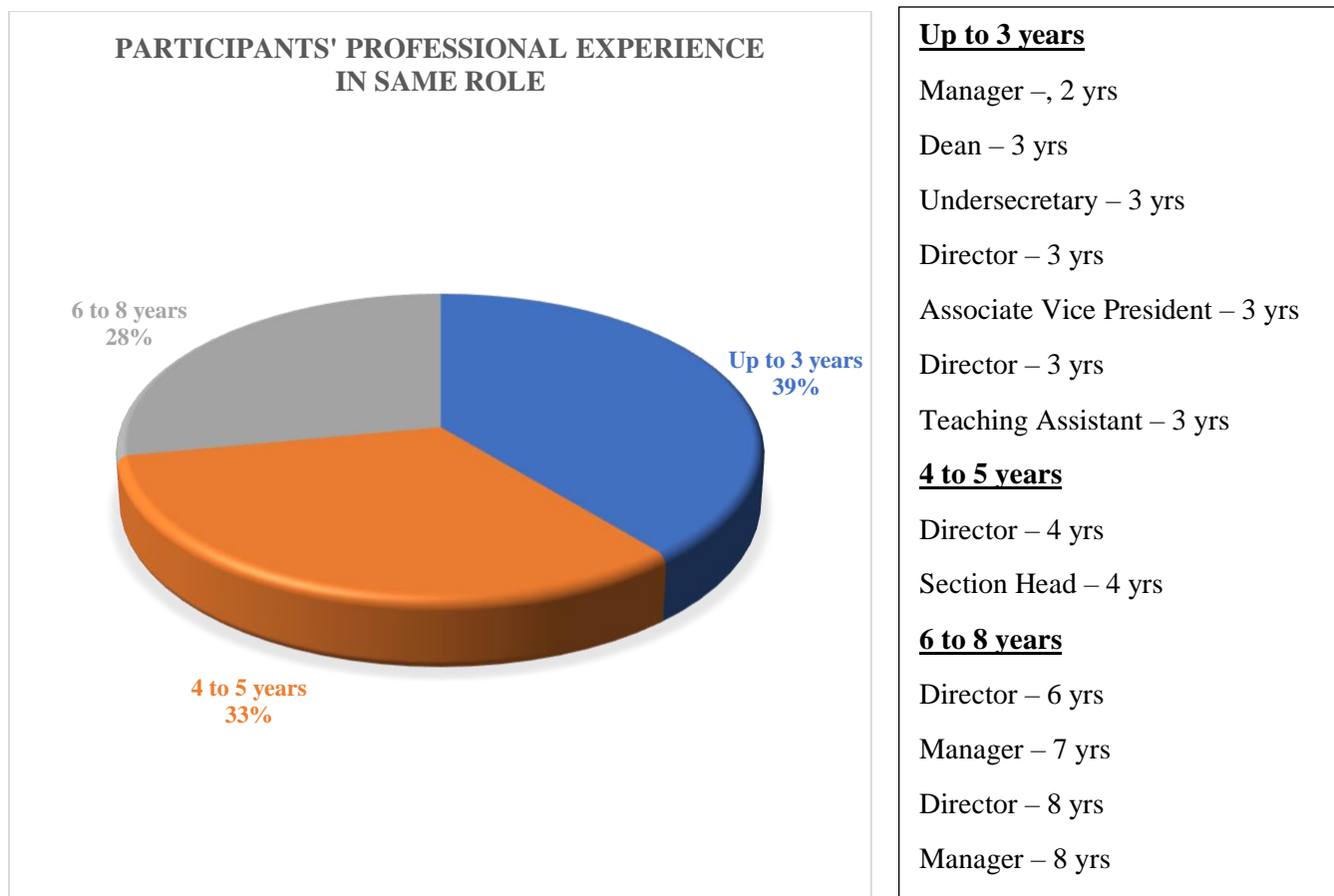
Figure 6-8: Professional experience (years) of the participants.

Source: The Researcher

From the findings in Figure 6-8, it was observed that all participants had worked in their respective roles for at least two years, and thus were knowledgeable regarding the various operations that took place. Further evaluation also indicated that the most experienced members had worked for eight years as directors, section heads, and managers. One of the managers had also worked in the same role for seven years and as a director for six years. Finally, the associate vice president, vice president, and chief were observed to work for at least five years.

6.4 Focus Group Particulars

After conducting the interviews with the various participants, the Researcher selected different professionals from both academic and non-academic institutions to participate in the focus group discussion. As the main objective of the focus group was to evaluate the proposed cyberspace culture framework and its role in attaining the higher education QNV 2030, the Researcher relied on the focus group to complement or support the interview findings. Accordingly, findings from

the interviews were presented first, followed by findings from the focus group. In this manner, both sets of findings were merged in a complementary manner such that the focus group supported the interview findings.

Next, the demographic details of the focus group participants are examined. Although the Researcher initially planned to facilitate two focus groups, the Covid-19 pandemic challenged this plan, and only one focus group was consequently facilitated. This comprised six participants discussing the role that the proposed cyberspace culture plays in attaining the higher education QNV 2030. Table 6-2 below lists some of the particulars of the focus group. Refer to Appendix C for the full details of the focus group.

Table 6-2: Particulars of the focus group.

No.	Respondent code	Interview setting	Professional roles	Professional experience
.1	Respondent 1	In person Face to Face	Section Head	8 years
.2	Respondent 2	In person Face to Face	Manager	6 years
.3	Respondent 3	In person Face to Face	Director	5 years
.4	Respondent 4	In person Face to Face	Manager	1 year
.5	Respondent 5	In person Face to Face	Director	5 years
.6	Respondent 6	In person Face to Face	Associate Vice President	2 years

Source: The Researcher

6.4.1 Respondents' Professional Responsibilities

First, the members' responsibilities were examined, as detailed in Figure 6-9:
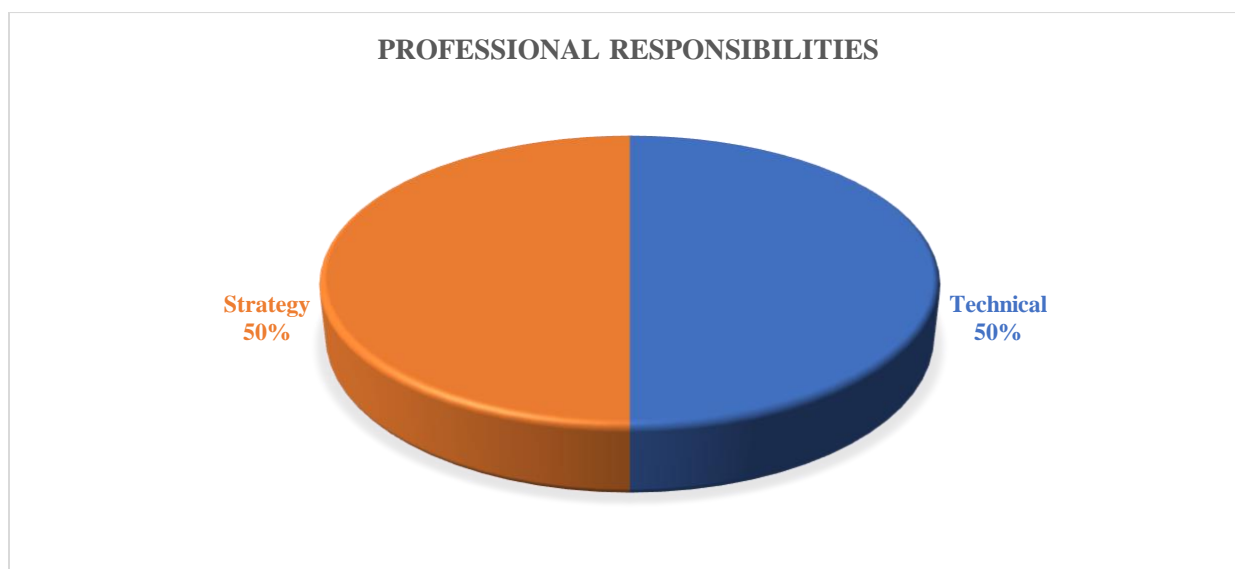
Figure 6-9: Professional responsibilities of the focus group participants.

Source: The Researcher

The reported findings demonstrate a balance in the participants' professional roles: 50% were in strategy while the remaining 50% resided in the technical sector.

6.4.2 Organisational Sector

Next, the organisational sectors from which the participants were drawn were further evaluated, as detailed in Figure 6-10 below:

ORGANISATIONAL SECTOR

Regulatory
33%

Higher Education
67%
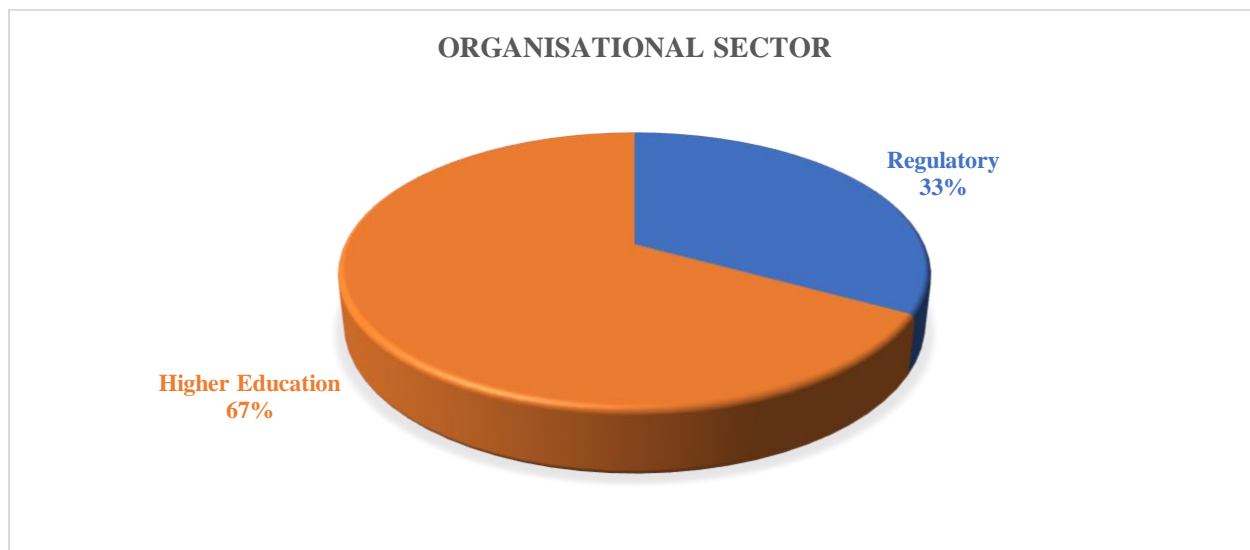
Figure 6-10: Organisational sectors of the focus group participants.

Source: The Researcher

The findings revealed that the majority of focus group participants (67%) came from the higher education sector rather than the regulatory sector (33%). This indicates that they were highly knowledgeable regarding academic issues that influence attaining the higher education 2030 vision.

6.4.3 Professional Roles

Since most members in the focus group were in higher education, their professional roles were further investigated, as detailed in Figure 6-11:

Professional Roles

Section Head	17.00%
Manager	33%
Director	33%
Associate Vice President	17%

0% 5% 10% 15% 20% 25% 30% 35%
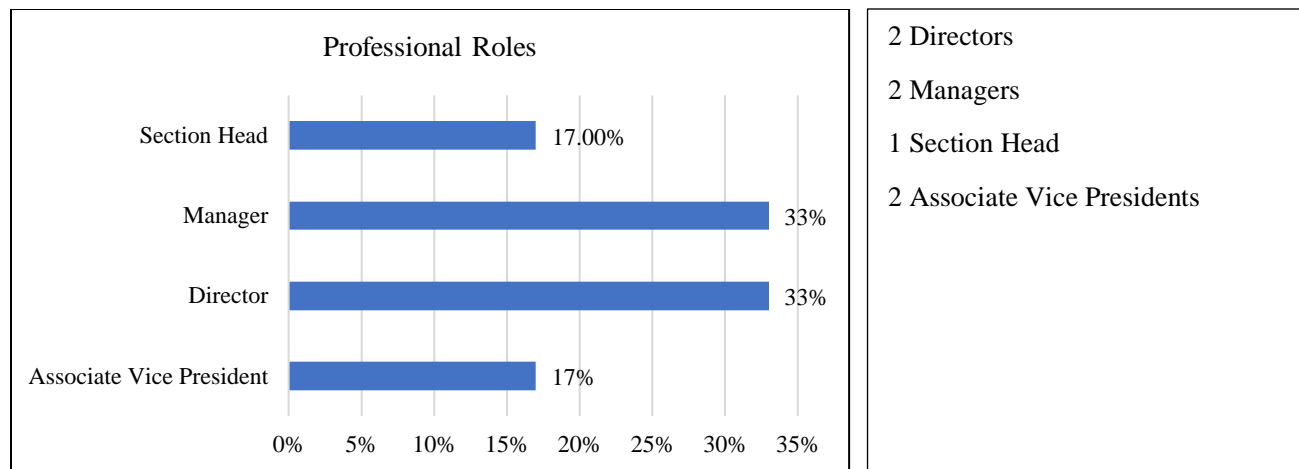
2 Directors
2 Managers
1 Section Head
2 Associate Vice Presidents

Figure 6-11: Professional roles of the focus group participants.

Source: The Researcher

The findings revealed that all participants held senior roles in a bid to ensure greater validity and reliability of the data collected in the discussion. The majority of the participants comprised directors (33.3%) and managers (33.3%). This suggests that they were knowledgeable regarding high-level issues that challenge the implementation of different directives in higher education.

6.4.4 Professional Experience

The participants' work experience in terms of years served was evaluated as well, as detailed in Figure 6-12 below:

WORK EXPERIENCE IN SAME ROLE

6 to 8 years
33%

Up to 2 years
34%
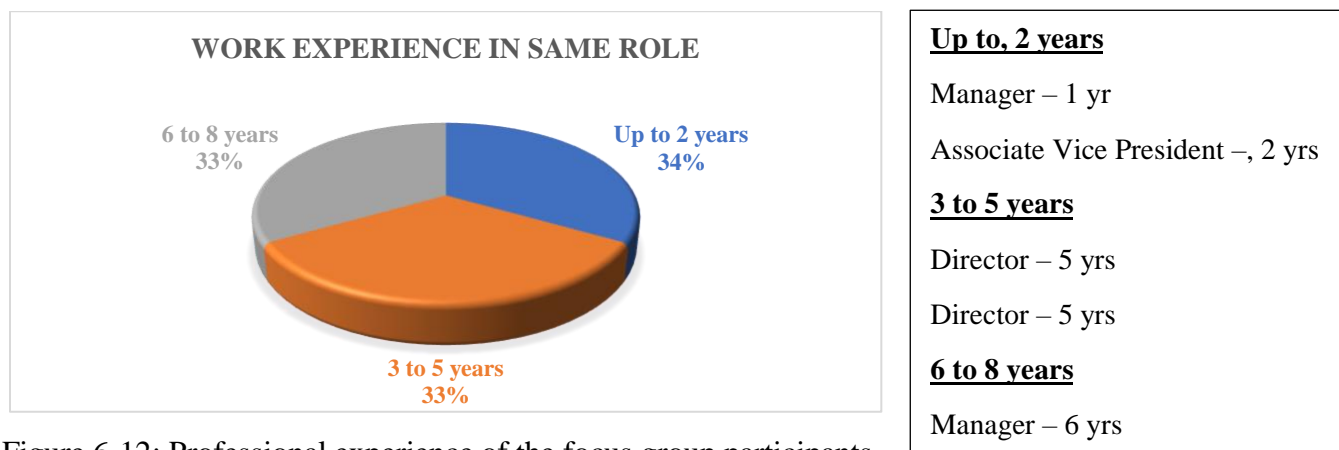
3 to 5 years
33%

Up to, 2 years
Manager – 1 yr
Associate Vice President –, 2 yrs
3 to 5 years
Director – 5 yrs
Director – 5 yrs
6 to 8 years
Manager – 6 yrs

Figure 6-12: Professional experience of the focus group participants.

Source: The Researcher

Based on the findings, the section head had worked for the longest period (eight years), followed by one of the managers (six years) and the directors (five years). Only one of the managers had worked for a one-year period.

6.4.5 Gender

The participants' gender was further evaluated, as detailed in Figure 6-13:
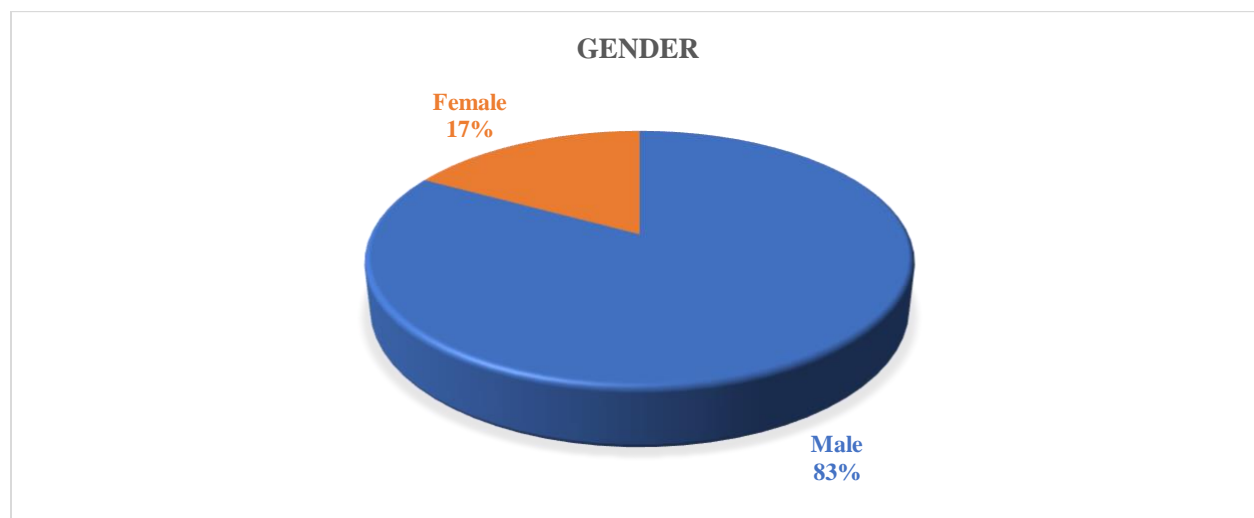
Figure 6-13: Gender of the focus group participants.

Source: The Researcher

From the obtained results, it was observed that there the focus group comprised more male (83.3%) than female participants (16.7%). This finding aligned with the interview results, which had demonstrated a similar result, thus suggesting that senior roles in higher education and regulation industries were male-dominated.

6.4.6 Nationality

Next, a summary of the focus group participants' nationalities is presented in Figure 6-14:

NATIONALITY

Non-Qatari
33%
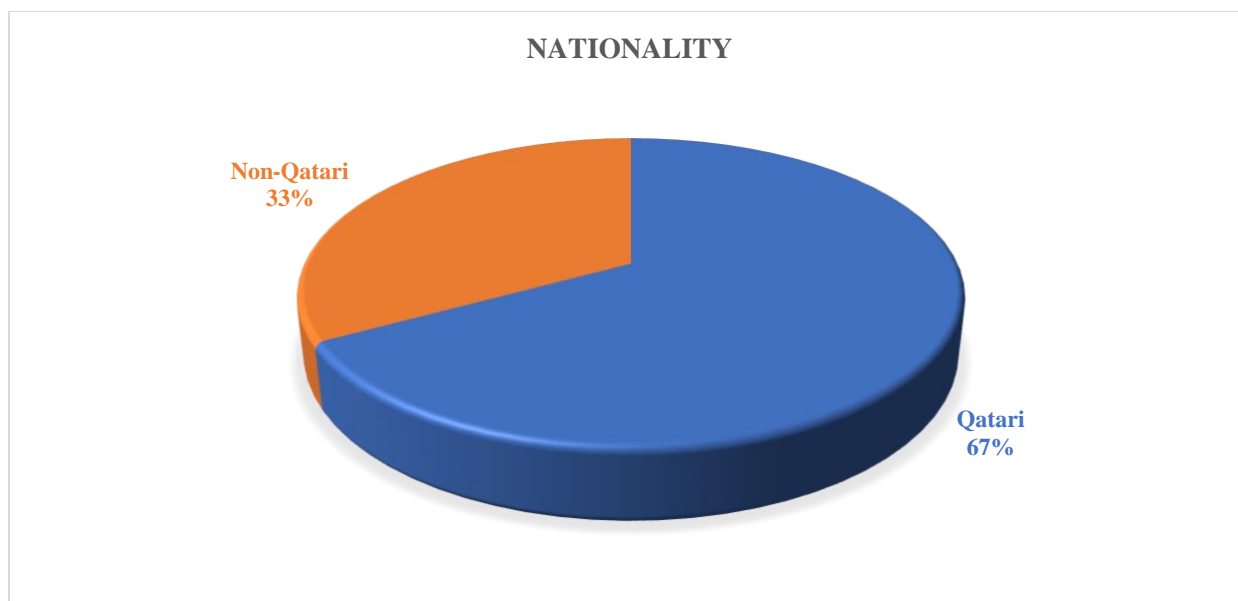
Qatari
67%

Figure 6-14: Nationality of the focus group participants.

Source: The Researcher

The obtained results indicate that the majority of the participants in the focus groups consisted of Qatari nationals (66.7%). However, since two individuals were foreigners (33.3%), this further suggests that the higher education professionals came from different countries.

6.4.7 Job Category

Finally, the participants' job categories were examined, as detailed below in Figure 6-15:

JOB CATEGORIES

Academic
33%
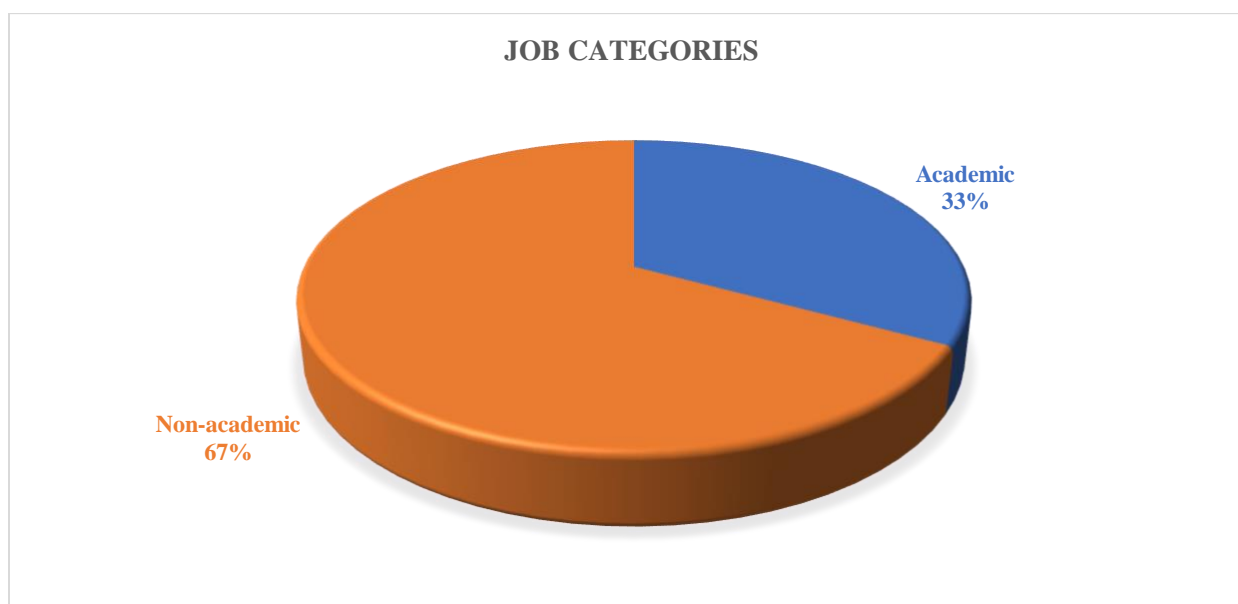
Non-academic
67%

Figure 6-15: Job category of the focus group participants.

Source: The Researcher

Based on an analysis of the results, most of the participants worked in non-academic roles (66.7%) compared to academic ones (33.3%). As such, they held managerial and technical positions as opposed to serving as professors and lecturers.

From the analysis of the participants' demographic details in Sections 6.3 and 6.4, it was observed that the respondents were highly experienced in their fields, as the majority possessed more than five years' experience. Similarly, the participants held senior roles in higher education and regulatory sectors as directors, managers, and presidents, assuming both regulatory and technical responsibilities. Such findings highlight the validity of the participants' responses regarding the diverse issues affecting the QNV 2030's implementation in higher education.

With this understanding, the participants' responses to the different interview and focus group questions were analysed accordingly in the NVivo 12 application, as detailed in the following section. Furthermore, the coming section also details the procedure adopted for conducting the thematic analysis.

6.5 Thematic Analysis

As revealed earlier in Section 5.7, a thematic analysis approach was adopted to analyse the data collected in the research. The justification for using the approach is that the Researcher only collected qualitative data—namely from semi-structured interviews (Chapter 5, Sub-Section 5.6.1) and focus group discussions (Chapter 5, Sub-Section 5.6.2)—to address the research questions (Chapter 1, Section 1.5). As revealed in Sub-Section 5.6.1.1, the Researcher organised the qualitative analysis approach into three steps: i) evaluating the participants' demographic details, ii) assessing the participants' perspectives regarding how the QNV 2030's achievement contributes to the cultivation of cyberspace culture, and iii) evaluating the proposed cyberspace culture framework's strategic alignment with the QNV 2030's achievement in higher education. The first segment of the analysis was completed in Sections 6.3 (interview particulars) and 6.4 (focus group particulars), in which the participants' demographic details were examined.

The current section (Section 6.5) undertakes thematic analysis to draw useful insights from the interview responses in preparation for addressing the research questions in Chapter 7. It is worth noting that thematic analysis of interview responses facilitates assessing the participants' perspectives regarding how the QNV 2030's achievement contributes to the cultivation of cyberspace culture. Likewise, thematic analysis of the focus group responses helps assess the strategic alignment of the proposed cyberspace culture framework with the achievement of the QNV 2030 in higher education.

Thematic analysis, as described by Erlingsson and Brysiewicz (2017) in Figure 6-1, represents a step-wise approach utilised to draw high-level insights from raw data. As such, this involves labelling the data, creating codes, grouping them into related categories, and, finally, generating themes that express the latent meaning, used to address research questions. Pietiläinen *et al.* (2017) also emphasise the need to adopt a step-wise process to analyse data thematically, including reviewing interview transcripts in order to gain a general sense of the data, generate codes, group them into categories, and identify themes.

In the first step of the analysis, the Researcher began by reading through the collected responses in the transcript files to generally understand what participants were discussing. However, codes, categories, and themes were not developed in the transcript files, since a directed content analysis strategy was utilised whereby the proposed cyberspace culture framework guided the identification of themes and codes (Sub-Section 6.2.2). In the second phase, the files containing the interview transcripts were loaded into Nvivo 12 software as raw data. The Researcher then further pre-processed the data in preparation for the analysis. For instance, pseudonyms were assigned to each participant in order to conceal their identity (e.g. Respondent 1 – R1; Respondent 2 – R2). Likewise, the participants' professional categories (strategy and technical) were assigned to each pseudonym so as to easily identify them ('S' for strategy and 'T' for technical). The focus group transcript (named Focus Group) was also added, along with the interviews, in order to read through the content within the program. Upon loading the data into Nvivo, the Researcher further conducted a word-frequency query to gain a general idea of what the participants broadly discussed. This process confirmed the initial findings that the Researcher identified from reading

through the transcript files. Figure 6-16 below illustrates the raw interview and focus group transcripts where participants were pseudonymised and a word-frequency query was undertaken:
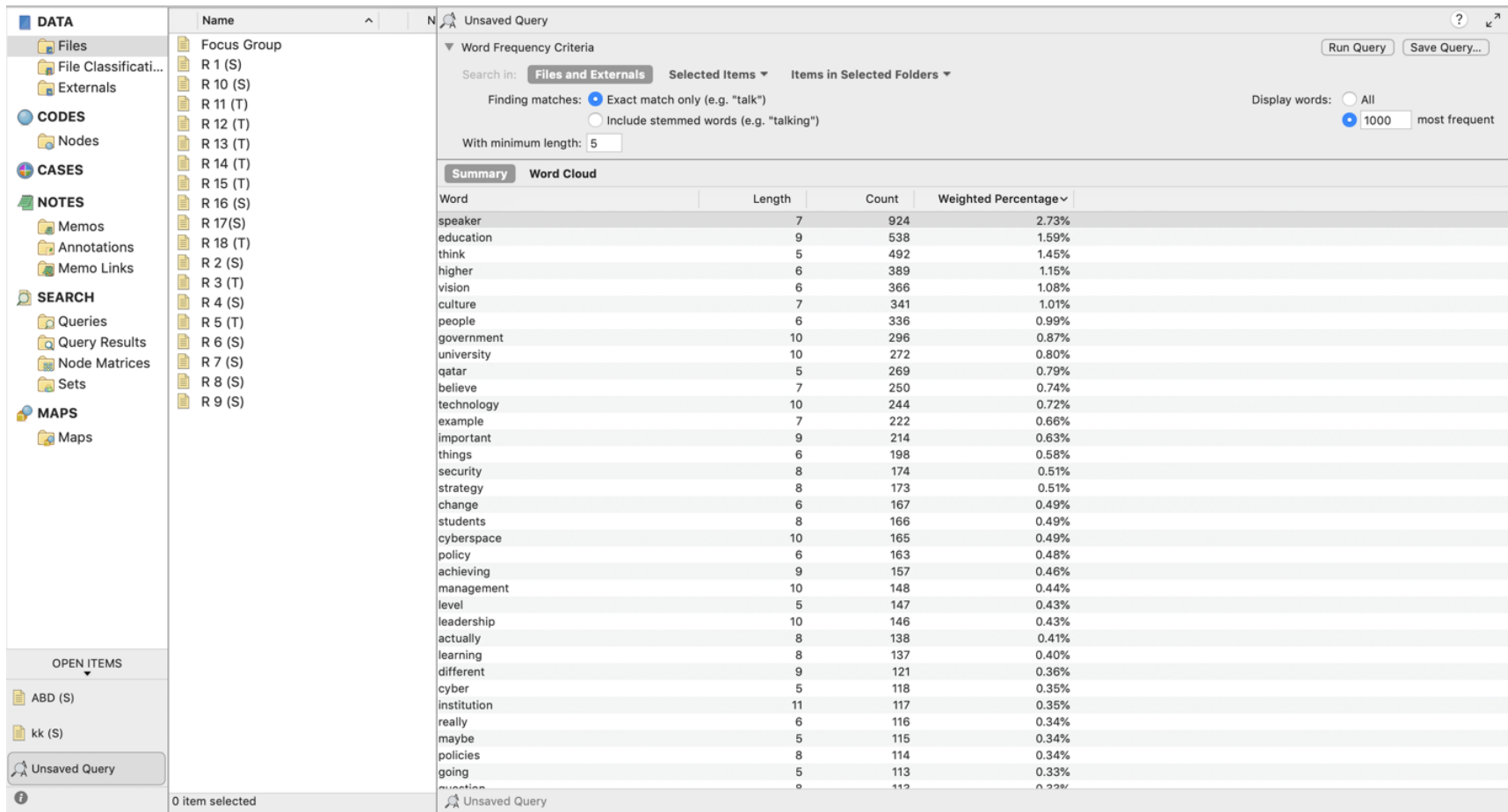
Figure 6-16: Synopsis of the interview responses.

Source: The Researcher

Table 6-2 further displays the word frequency of terms appearing with a word count of at least 300:

Table 6-2: Word frequency and weighted percentage of most common words.

Word	Length	Count	Weighted Percentage
Speaker	7	924	2.73%
Education	9	538	1.59%
Think	5	492	1.45%
Higher	6	389	1.15%
Vision	6	366	1.08%
Culture	7	341	1.01%
People	6	336	0.99%

Source: The Researcher

The results in Table 6-3 indicate that the most common terms arising in the interview responses, producing a count of at least 300, included speaker (2.73%), education (1.59%), think (1.45%), higher (1.15%), vision (1.08%), culture (1.01%), and people (0.99%). From an analytical perspective, it is argued that the terms' frequency emerged from references to the proposed cyberspace culture framework elements that respondents evaluated as well as the duplicated interview questions employed. Furthermore, the consistent reference to 'government' and 'university' also suggests that they played a significant role in addressing the research questions. However, as the data were not organised thematically, it can be further argued that the word 'query' did not generate any valuable output to address the research questions.

Therefore, the next step involved generating codes and themes from the raw data using a directed content analysis approach (Sub-Section 6.2.2). From Figure 4-7, which illustrates the proposed cyberspace culture framework, the Researcher identified four themes in relation to the framework's components. These aspects were considered themes because a) the interview questions were also organised based on the various issues and b) participants were questioned on

the different thematic aspects (refer to Appendix A for the interview questions). The themes in the research included the following:

1. External elements and attainment of the higher education QNV 2030 (Q1–Q5).
2. Internal elements and the higher education QNV 2030 (Q6–Q8).
3. Culture and the higher education QNV 2030 (Q9).
4. Proposed cyberspace culture framework (Focus group Q1).

Each theme was evaluated in the NVivo application in order to extract useful insights to address the research questions, as detailed in the following sections.

However, the Researcher began by generating a hierarchy chart to gain insight into the distribution of themes in terms of their weight in the research. Figure 6-17 displays the overall visualisation of theme distribution:
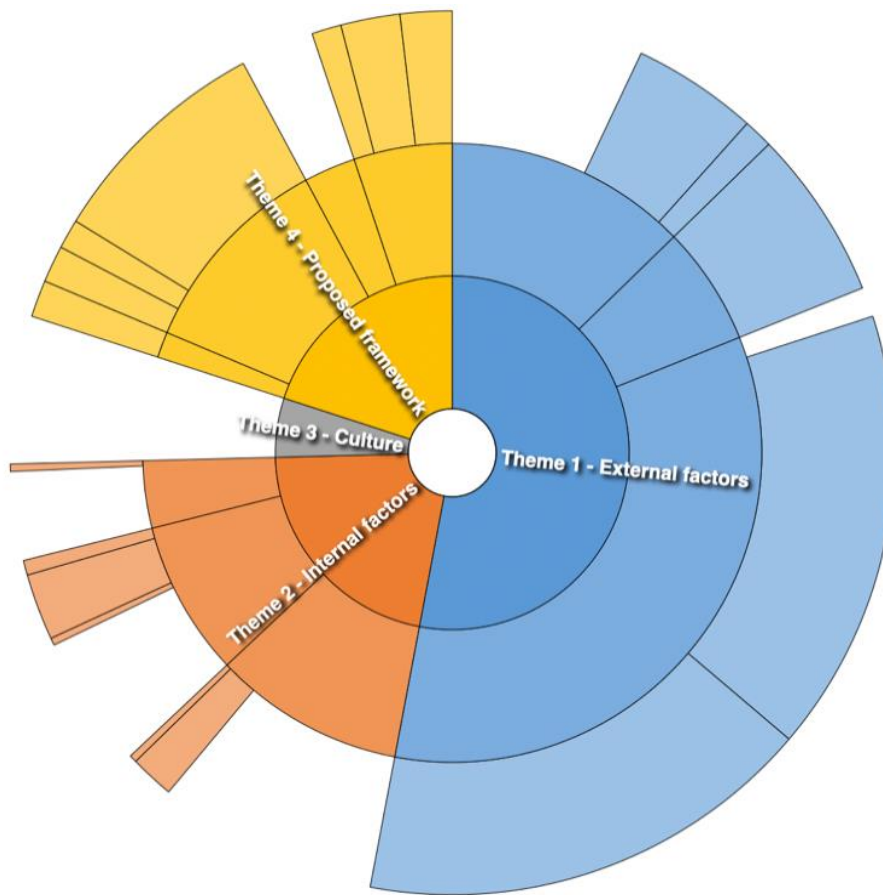
Figure 6-17: Sunburst illustrating distribution of research themes.

Source: The Researcher

Figure 6-17 above illustrates that the responses more heavily emphasised the external rather than internal elements and culture. A treemap of the responses was also generated, as detailed in Figure 6-18, which further illustrates the actual elements to which the participants mostly referred:
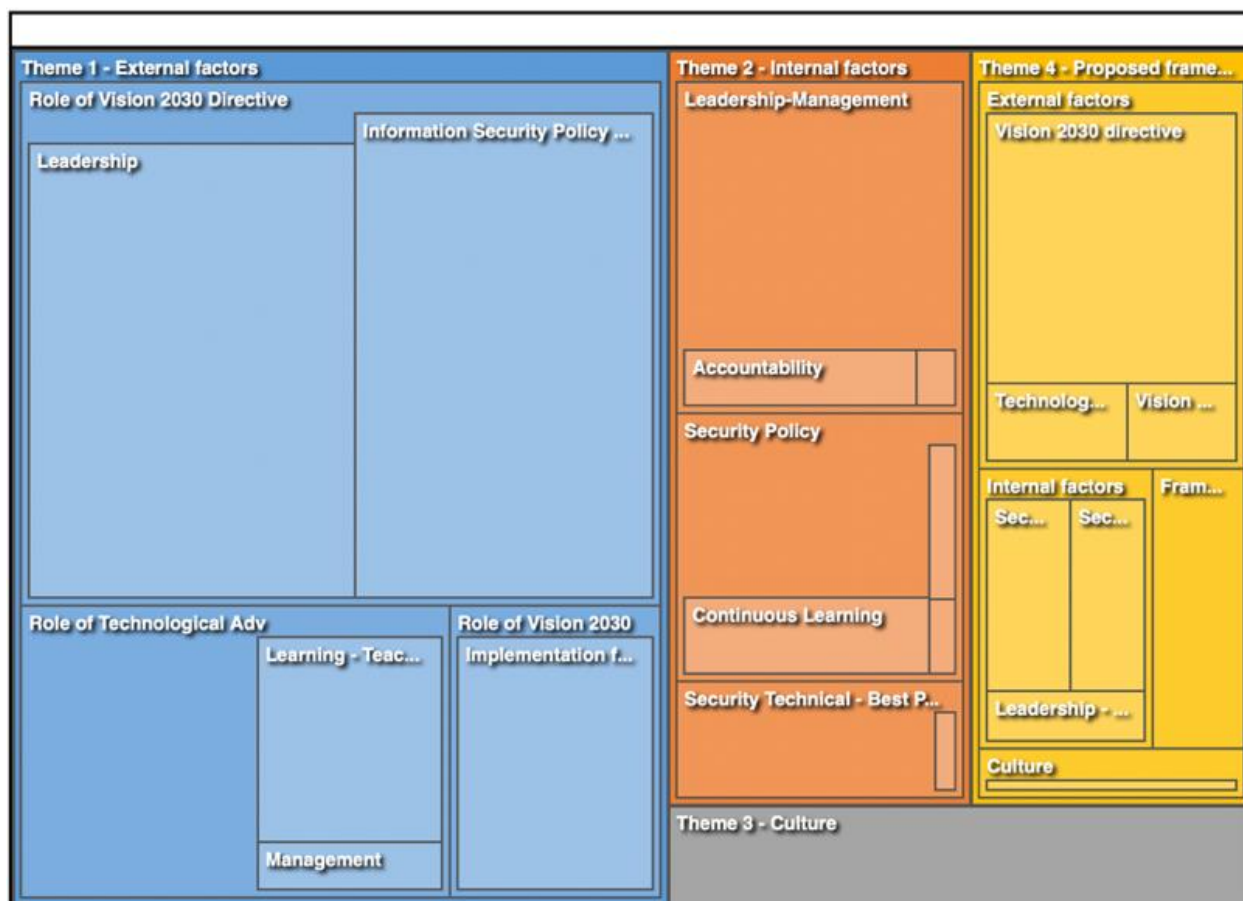
Figure 6-18: Treemap illustrating distribution of research themes.

Source: The Researcher

Based on the size of the different tree nodes in Figure 6-18, the obtained findings also reiterate that the respondents placed greater emphasis on leadership, information security policy, and technological advancement compared to other aspects.

Furthermore, to identify the underlying factors leading to this distribution, the Researcher generated coding references and determined the number of coded items for each research theme,

as displayed in Table 6-3. Table 6-3 displays only some of the coding references per theme. However, in Appendix D, the full table details are displayed.

Table 6-3: Number of coding references and items coded per theme.

Theme	Sub-theme	Main code
External elements (Sub-Section 4.7.2)	Role of the QNV 2030 directive (Sub-Section 4.7.2.3)	Leadership (Sub-Section 4.7.2.1.1)
		Information security policy and regulation (Sub-Section 4.7.2.1.2)
	Role of technological advancement (Sub-Section 4.7.2.2)	Technological advancement (Sub-Section 4.7.2.2)
	Role of the QNV 2030 (Sub-Section 4.7.2.3)	The QNV 2030 framework (Sub-Section 4.7.2.3.1)
Internal elements (Sub-Section 4.7.1)		Leadership and management strategies (Sub-Section 4.7.1.1)
		Security policy (Sub-Section 4.7.1.2)
		Security technical and best practices (Sub-Section 4.7.1.3)
Role of culture (Sub-Section 4.7.3)		Dimensions of culture (Sub-Section 4.7.3.2)
		Levels of culture (Sub-Section 4.7.3.1)

Source: The Researcher

The evaluation of the results in Table 6-3 indicates that the external elements possessed the highest number of coded items, including economic factors (13), external pressure (16), compliance and

advanced security (4), environmental uncertainty (12), political factors (10), learning and teaching (9), management (4), and implementation framework (17). This was followed by internal elements, including accountability (5), risk management (1), security awareness (3), continuous learning (8), attitudes and behaviour (1), and security skills and knowledge (1). Culture produced the least number of coded factors (1). These results align with the previously generated sunburst (Figure 6-17) and treemap (Figure 6-18) results, which demonstrated similar insights.

In the NVivo application, the Researcher created and nested the nodes in a hierarchical format below the various main codes, sub-themes, and themes. Figure 6-17 below displays the hierarchical organisation of all research themes and codes in the NVivo application for the four themes:

Figure 6-17: Organisation of research themes and codes.

Source: The Researcher

From Figure 6-17, the categories of different themes can be drawn; for instance, under Theme 1, the three sub-themes of the research are identified—namely, the role of the Vision 2030 directive, the role of technological advancement, and the role of the QNV 2030. Under each sub-theme, individual factors are further outlined. The established hierarchy mirrors the proposed cyberspace culture framework developed in the research (Figure 4-7) and facilitates the analysis as findings identified under each code were easily compared against insights obtained from the review of previous literature studies (Chapters 2–4).

In the following sections, a detailed thematic analysis is undertaken in order to obtain useful insights for addressing the research questions.

6.5.1 Theme 1: External Elements and Attainment of the Higher Education 2030 Vision (Q1–Q5, Appendix A)

The first theme involved identifying how external elements influence attaining the QNV 2030 in higher education (Sub-Section 4.7.2). To this end, three main external elements were specified by the proposed cyberspace culture framework (Figure 4-7): a) the QNV 2030 directive (Sub-Section 4.7.2.1), b) technological advancement (Sub-Section 4.7.2.2), and c) the QNV 2030 (Sub-Section 4.7.2.3). The elements were also split further into individual factors, as detailed in the proposed cyberspace culture framework (Chapter 4, Section 4.7). For clarity purposes, Table 6-3 displays the various categories of the external elements (considered sub-themes) that were outlined:

Table 6-3: External elements' codes, sub-themes, and themes.

Codes	Main Code	Sub-Themes	Theme
Economic factors (Sub-Section 4.7.2.1.1.1)	Leadership (Sub-Section 4.7.2.1.1)	Role of the QNV 2030 directive (Sub-Section 4.7.2.1)	External elements
External pressure (Sub-Section 4.7.2.1.1.2)			
Compliance and advanced security (Sub-Section 4.7.2.1.2.1)	Information security policy and regulation (Sub-Section 4.7.2.1.2)		
Environmental uncertainty (Sub-Section 4.7.2.1.2.2)			

Political factors (Sub-Section 4.7.2.1.2.3)			(Sub-Section 4.7.2)
Learning, teaching (Sub-Section 4.7.2.2.1)	Technological advancement (Sub-Section 4.7.2.2)	Role of technological advancement (Sub-Section 4.7.2.2)	
Management (Sub-Section 4.7.2.2.2)			
Implementation framework (Sub-Section 4.7.2.3.1)	The QNV 2030 framework (Sub-Section 4.7.2.3.1)	Role of the QNV 2030 (Sub-Section 4.7.2.3)	

Source: The Researcher

The next process involved assigning each of the participants' responses to the various codes in order to organise the responses thematically. For instance, Interview Question 3 (Appendix A, Q3) assessed the participants' views concerning the role of advanced technologies for achieving the higher education 2030 vision in terms of management on the one hand and learning and teaching on the other. In Nvivo 12, the Researcher organised responses for this particular question from all participants under the respective codes—namely, management and both learning and teaching. In this manner, insights from all participants could be easily drawn from one location.

6.5.1.1 The QNV 2030 Directive – Leadership

In the first interview question, participants were asked to discuss how the government's (Vision 2030 directive) leadership in terms of strategy formulation influenced the attainment of the higher education 2030 vision. Literature suggests that the government represents a key stakeholder in cyberspace, alongside public authorities, commercial enterprises, and individuals (Canton, 2012). As a stakeholder, the government plays a role in the overall decision-making process in cyberspace, the development of rules governing the usage of cyberspace, and the management of security issues (Barzilai, 2004). Examining how the government's decisions and strategies influence the attainment of the higher education 2030 vision was therefore important in this research.

First, however, it was important to identify the contexts in which government leadership was discussed by the participants. Table 6-4 presents the word frequency of terms used in reference to leadership (word count of at least 100):

Table 6-4: Word frequency and weighted percentage of leadership words.

Word	Count	Weighted Percentage
Government	359	1.02%
University	332	0.94%
Technology	241	0.68%
Leadership	169	0.48%
Cyberspace	147	0.42%
Management	132	0.37%
Institution	120	0.34%
Universities	111	0.31%
Institutions	101	0.29%
Organisations	101	0.29%

Source: The Researcher

Analysis of the results in Table 6-4 indicates that leadership was discussed in the context of the government (1.02%), university (0.94%), technology (0.68%), cyberspace (0.42%), management (0.37%), institutions (0.34%), and organisations (0.29%). The findings emphasise that interview participants, at the least, identified the interaction of government leadership with different stakeholders such as universities and institutions in strategy formulation.

Further evaluation of the responses revealed that the government was considered an oversight authority that plays an important role in influencing the implementation of different strategies, regulations, and policies. In this light, four participants (22.2%) cited that the government is influential in developing implementation plans and policies that will be adopted by institutions. More specifically, Respondent 1 argued that the government is responsible for formulating policy, providing funding, and enhancing collaboration among stakeholders:

'The government is pushing all the regulatory, policy, and strategy and funding mechanisms and making the stakeholders do this kind of thing. The role of the government is very important'. (Respondent 1)

Respondent 9 added that the government, as a leader, provides implementation directions for the 2030 vision:

'It is extremely important; it's vital. I think the leadership should really give very explicit directions on how to execute the, 2030 vision and the implementation of Vision 2030. It is also important that it should be on top, not bottom-down'. (Respondent 9)

Analysis of the responses highlights the fact that the government's strategies are influential for achieving the higher education vision through policy development, funding, and guiding the implementation of the 2030 vision. The findings confirm previous literature in Sub-Section 2.4.1 suggesting that Qatar's government developed the QNV 2030 as a strategy to modernise the country by ensuring all sectors (economic, social, environmental, and human) are well developed. Policy and funding are emphasised in the QNV 2030's attainment.

Respondent 3 further viewed the government as playing an integral role as a source of direction for the different institutions, such as by providing guidelines regarding the adoption of e-learning:

'Since we have some ministries and the government role, both have guidelines for how they govern the systems, so I think there is a government role. So, they can set the direction, and then this will be led by the institutions'. (Respondent 3)

Respondent 10 also highlighted a similar role of the government in education development. In the respondent's words,

'Well, actually, I do believe that they have a major role in changing or implementing the Vision 2030, especially in education. I think educational decisions must be taken from, originally speaking, the government'. (Respondent 10)

The findings from these two participants further confirm previous literature in Sub-Section 2.4.2.2, which details the government's strategies for education development in the QNV 2030. The identified strategies include enhancing scientific research (Gasser and Drolshammer, 2015), boosting learning and teaching (Talebian *et al.*, 2014), and enhancing innovation and knowledge-searching processes (Zhou *et al.*, 2019). The findings also reiterate literature in Sub-Section 3.2.2.1, where quadrant II analysis emphasised cyberspace as a tool of learning and the government's strategies for guiding its use for that purpose.

Next, the role of the government's strategy was further investigated regarding its influence on economic factors and external pressure.

6.5.1.1.1 Economic Factors

In the first part of Interview Question 1 (Appendix A), participants were asked how the government's strategy concerning economic issues would likely affect the implementation of the higher education 2030 vision. Figure 6-18 displays the distribution of responses that were obtained:

ECONOMIC FACTORS

Not Important
22%
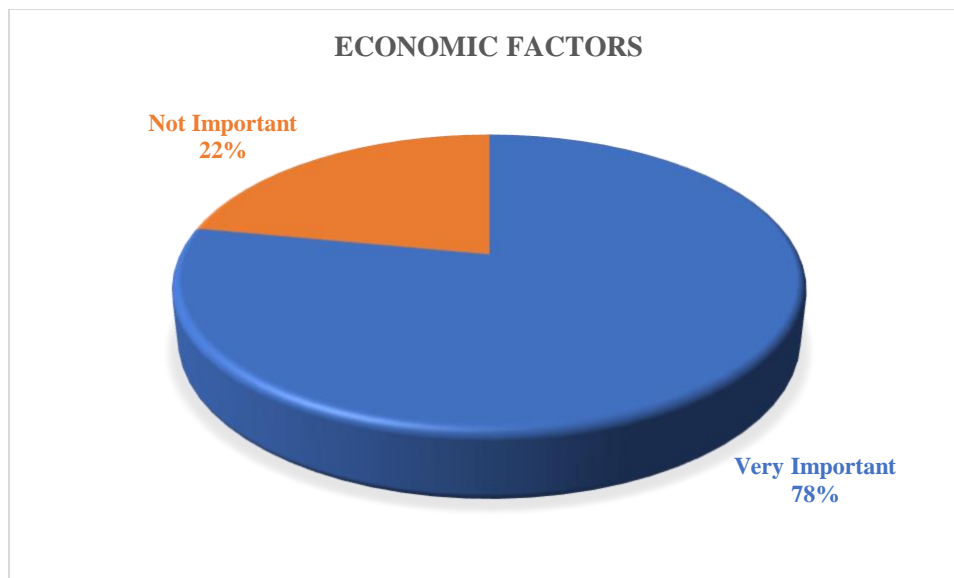
Very Important
78%

Figure 6-18: Participants' views on the impact of economic factors.

Source: The Researcher

Based on an evaluation of the responses, 14 participants (78%) agreed that funding was highly important while four respondents (22%) disagreed with the assertion. Among the participants who agreed, the role of funding in enhancing the implementation of the required education infrastructure was noted as the first aspect. Respondent 1 noted that the majority of higher education institutions in Qatar are fully funded by the government, which is mandated to support them financially:

'Of course, there is no education without funding, as it is critical. It requires massive Infrastructure …. If you take, for example, Qatar university, CCQ, CNAQ, university of Calgary, those are fully funded, and also all the QF universities'. (Respondent 1)

The findings confirm the literature in Sub-Section 3.2.2.1 stating that infrastructure invested in cyberspace as a tool of learning mediates collaborative work outside classroom environments through advanced tools and technologies (Fabos and Young, 1999; McLellan, 1998; Reynolds, 2002; Riel, 1995). The findings also resonate with work by researchers in Sub-Section 2.5.2.1, such as Johnson et al. (2018), who reported that online and video-based teaching playgrounds enable prospective teachers to prepare effectively and enhance teaching in online environments.

Likewise, Xu and Dai (2019) reported that adopting situational teaching positively affects the enhancement of online learning. As such, the findings indicate that cyberspace is increasingly being leveraged to improve learning and teaching practices.

Second, according to the findings, participants believe that a mutual relationship exists between the economy and education whereby funding education serves as an engine for building the economy. As such, government funding is observed to increase the existing workforce's capacity. Respondent 4 further argued that government funding plays a role in increasing the economic viability of higher education institutions, such as in creating more institutions:

> 'Leadership strategies to increase the economic viability of higher education institutions—for example, creating more courses and expanding institutions—yeah, I think so'. (Respondent 4)

Third, Respondent 6 reported that sustainability in the educational sector is also linked to funding from the government whereby the provision of all required resources, such as land to build campuses, would benefit both current and future generations:

> 'We want the people who live in Qatar and their children to be educated here in different universities at different levels, and according to their skills'. (Respondent 6)

In summary, evaluating the responses indicates that the majority of participants (78%) agreed that the government's strategy towards funding education is vital for establishing cyberspace culture, as funding facilitates the acquisition of infrastructure, the setup of institutions, the improvement of technology and courses, and the sustainability of higher education. Similar findings have been reported in the literature reviewed in Sub-Section 2.4.2.2, where Qatar's Vision, 2030 focusses on funding education to improve its stature to a world-class level (Talebian *et al.*, 2014; Gasser and Drolshammer, 2015; Dunn and Kennedy, 2019). However, approximately 22% disagreed that funding is not a major requirement for advancing higher education institutions.

6.5.1.1.2 External Pressure

In the second part of Interview Question 1 (Appendix A), participants were also asked how the government's strategy directive, which culminates in external pressure, is likely to affect the implementation of the higher education 2030 vision. The government's external pressure was argued to arise from its role as a stakeholder in funding the development of the education sector and in formulating policies that guide higher education institutions (Sub-Section 4.7.2.1.1.2). Literature additionally confirms that the government plays an integral role in both funding the sector and fostering partnerships with foreign investors, thus highlighting a need to ensure higher education institutions are accountable (Cantwell, Coate and King, 2018).

Figure 6-19 below displays the distribution of the views obtained from the respondents:
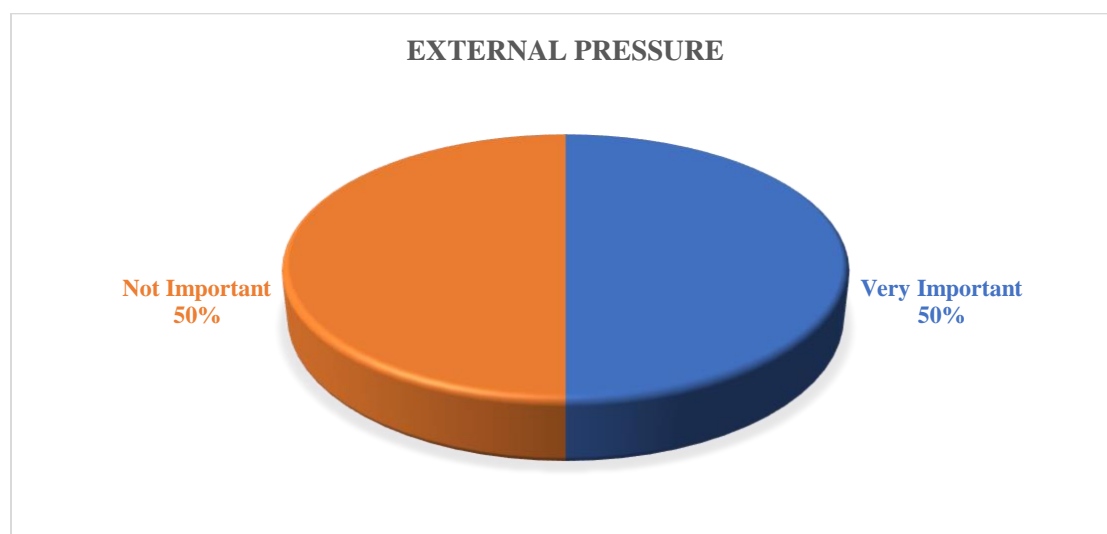
Figure 6-19: Participants' views on the impact of external pressure.

Source: The Researcher

From the evaluation of Figure 6-19, approximately nine of the participants (50%) argued that external pressure is highly important. In support of these positive findings, Respondent 6 agreed that current directives from the government exert pressure on the operations of institutions, primarily because the institutions report to the government. As a result, the institutions are required to consistently evaluate whether they are meeting the demands set by the government. Specifically, Respondent 6 asserted the following:

'Yeah, there is pressure. There is all of this, and we report to a higher authority all the time in the governments about our achievements, and they also check what we are doing'. (Respondent 6).

Respondent 9, meanwhile, explained that the Ministry of Higher Education is the source of pressure:

'The leadership pressure by the education ministry for higher education, in my opinion, you can do it from the other way around'. (Respondent 9).

However, an additional 50% of respondents further highlighted that external pressure does not exist in Qatar higher education. For instance, Respondent 7 revealed that external pressure from the government remains lacking:

'For now, we do not see the external pressure. The only type of pressure we see is internal, so maybe because, you know, we are not in higher administration, maybe the pressure is placed on the president of the university and his vice president'. (Respondent 7)

Supporting this view, Respondent 12 also denied the existence of external pressure:

'Are they actually bringing any pressure on them or not? I don't see it. To be honest, I have not seen this. It is not happening. But even if it does happen, I think that the university, the Qatar University administration, may or may not take it. But I have not seen anything so far'. (Respondent 12)

Among the nine participants (50%) who agreed, three of them (16%) argued that, although pressure is important, it does not exist in Qatar higher education institutions. For instance, Respondent 18 cited that, though pressure exists, it is positive and beneficial for the institutions, as it enables them to achieve more goals:

'I mean, if we consider strategic goals that are set by the country as pressure, I will say it is positive pressure'. (Respondent 18)

Respondent 16 agreed with this assertion and reported that a positive rapport exists between higher education institutions and the Ministry of Higher Education, and as a result, higher education institutions can more flexibly achieve their goals:

'They (the ministry) really allowed much more flexibility for Qatar university for the higher education component. So, I do not think we will have any pressure from the ministry to achieve anything'. (Respondent 16)

Therefore, regarding how external pressure influences the achievement of cyberspace culture, conflicting views were reported: only 34% of the participants agreed that there is external pressure to meet standards set by the Ministry whereas 50% denied its existence. However, 16% of the respondents cited that, although pressure is important, it does not exist in Qatar higher education institutions.

Respondents who denied the existence of pressure (11.1%) argued that universities are required to pressure themselves to achieve higher education objectives. The literature reviewed in Section 2.7 further highlights the need to develop transparent and unbiased rules to govern cyberspace (Goi, 2009); subsequently, this also emphasises the need for accountability among actors in cyberspace, thus leading to reports of external pressure.

6.5.1.2 The QNV 2030 Directive – Information Security Policy

In Interview Question 2 (Appendix A), the research investigated how, in terms of information security policy, the QNV 2030 directive influences the attainment of the higher education 2030 vision. The literature reviewed in Sub-Section 2.2.2.2 conceptualises cybersecurity as the protection of data, networks, and systems (Lindsay, 2015; Dorsey *et al.*, 2017). Additionally, studies reviewed in Section 2.3 underscore the challenges of insecurity in cyberspace's evolution (Galinec *et al.*, 2017; Deloitte, 2017). Therefore, the synthesis of findings in this section outlined the various ways in which information security policy from the government influences the achievement of the higher education 2030 vision.

First, findings revealed a consensus that information security policy is important not only in higher education, but also in other private sectors. Respondent 9, for instance, explicated the following:

'This is very important and will not only affect higher education, but also, it will affect everything … health, private sector, government sector'. (Respondent 9)

In higher education in particular, Respondent 8 highlighted a need for standard policies that govern the entire sector to improve education for the whole country. Respondent 8 further described a need for different institutions to adopt similar information security policies. This highlights the notion of fragmented leadership in Qatar's higher education sector, which has subsequently led to individual differences in policies and procedures in the institutions. Gaps were subsequently identified in the institutions, as described by Respondent 8:

'If you have your own policy and procedures as one institution, what about the others? … To be honest with you, we have a gap here … we have to manage this gap between the government and the ministry of education, and also other kinds of institutions'. (Respondent 8)

Such findings from Respondent 8 regarding the fragmented nature of higher education and cybersecurity confirm the literature in Sub-Section 2.8.1, where gaps were identified in cyberspace security for both academic learning and private use (Brunn, 2014).

However, Respondent 1 noted that the government has made strides towards enhancing information security policies by establishing different committees and creating cybersecurity frameworks. The respondent argued that, over the years, information security policies have grown beyond their limited role in the IT department to affect other non-IT-related sectors, such as football and the World Cup. As a case in point, the Qatar 2022 Cybersecurity Framework was created in August, 2018 in preparation for the 2022 FIFA World Cup. The premise of this framework consisted of ensuring security for Qatar's inhabitants in cyberspace, as the tournament was expected to be digitally enabled and operated using innovations such as artificial intelligence,

the Internet of Things, and machine learning. Further analysis of the framework revealed that it specified how cybersecurity would be governed in terms of not only aspects such as endpoint, application, and network security, but also data protection, operations technology security monitoring, incident handling and recovery, and data privacy. The framework was argued to be developed in support of the larger 2030 QNV framework and, as such, indicated that the government was making progress in the institution of policies.

As guided by the proposed cyberspace culture framework (Figure 4-7), the Researcher further investigated how attainment of the higher education 2030 vision was influenced by three influential factors—namely, compliance and advanced security (Sub-Section 4.7.2.1.2.1), environmental uncertainty (Sub-Section 4.7.2.1.2.2), and political factors (Sub-Section 4.7.2.1.2.3).

6.5.1.2.1 Compliance and Advanced Security

In regard to how compliance and advanced security influence the attainment of the higher education 2030 vision, the perspectives obtained from the respondents are detailed in Figure 6-20:

COMPLIANCE ON ADVANCED SECURITY

Not Important 22%

Very Important 78%
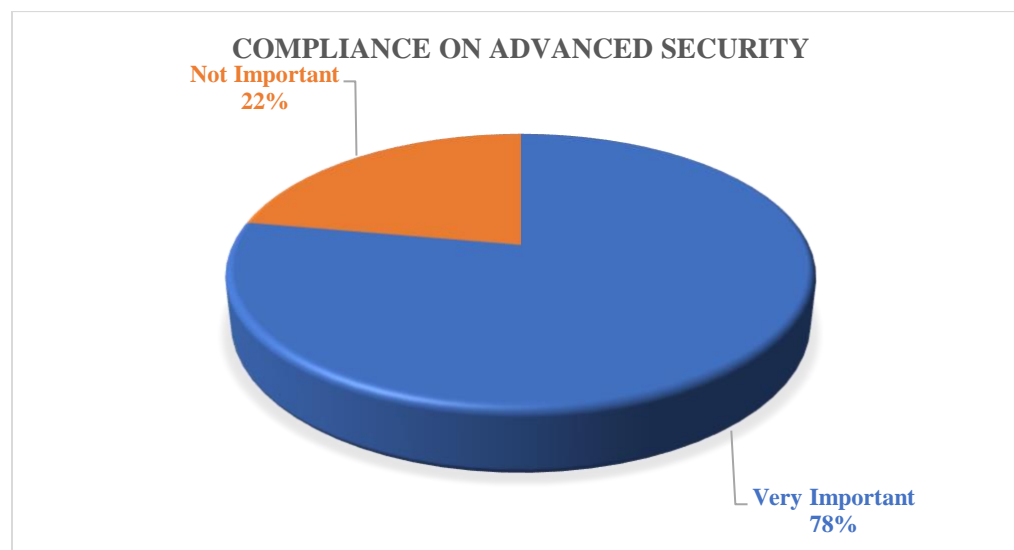
Figure 6-20: Participants' views on compliance with advanced security.

Source: The Researcher

According to the analysis, 14 respondents (78%) considered compliance and advanced security as highly important. However, 2 of the 14 participants (11%) cited that, although compliance is

important, it is not present in Qatar higher education. Likewise, four respondents (22%) argued that compliance is not important at all. However, the emergent theme from the responses was that the majority of participants vouched for compliance with advanced security. For instance, Respondent 2 argued that compliance enables higher education institutions to not only adhere to business practices in the international market during implementation of online systems such as networking and cloud computing, but also to adhere to the government's regulations. However, it was also argued that the regulations only affected how business was performed rather than the curriculum's delivery.

Respondent 2 asserted the following:

> 'But when we implement any online businesses, like networking or cloud, in this, we have to abide by the government regulations. This, we cannot do outside the space'. (Respondent 2)

Second, compliance with international guidelines and best practices was also emphasised to protect the international community and society. Therefore, institutions in Qatar must comply with established standards to transact with parties in foreign countries. The finding regarding compliance with international standards and protection of the international community additionally confirms the literature in Section 2.3, which emphasises that cyberspace represents a broad concept that transcends international boundaries and involves interaction with diverse community members.

Third, Respondent 12 argued that the government's oversight over institutions has also increased over time, and as such, institutions are required to demonstrate accountability by complying with set regulations:

> 'Now, we are seeing them (government) asking about our operations – for instance, what we are doing, and account for our actions. There are a lot of business requirements that they have been asking about'. (Respondent 12)

Additionally, findings indicated that, since the government provides support to higher education institutions in terms of funding, those institutions must comply with the directives issued by the government regarding information security. For instance, the privacy law introduced by the Qatar government requires institutions to manage the security of the data they collect. These findings were confirmed in the literature, whereby cybercrime laws were enacted in Qatar to preserve intellectual property (Foody *et al.*, 2017).

However, in the same vein, participants claimed that the government possesses a mandate to craft the policies carefully, as some institutions only comply with the regulations for the sake of, and not in consideration of, their value. The discussions by Respondents 2 and 12 emphasise insights from the literature reviewed in Section 2.7 regarding the openness of cyberspace culture and the need for guiding rules to direct actors in cyberspace.

6.5.1.2.2 Environmental Uncertainty and Political Factors

Although the two factors (environmental uncertainty and political factors) represent different constructs, the Researcher discussed them in one section due to the overlap identified from the analysis of the responses. Figure 6-21 below accordingly displays the respondents' views concerning environmental uncertainty and political factors:
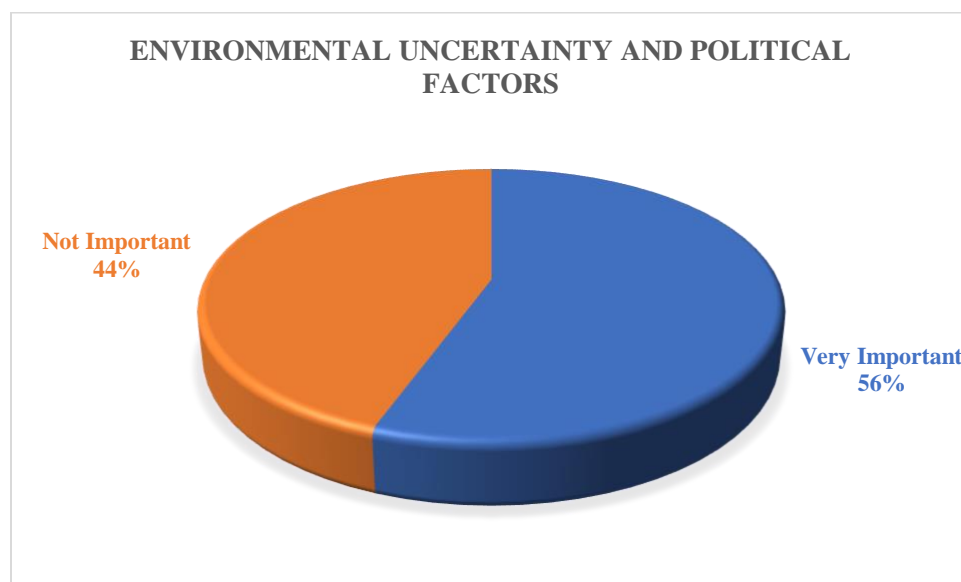
Figure 6-21: Participants' views on environmental uncertainty and political factors.

Source: The Researcher

Based on the evaluation of the findings in Figure 6-21, 10 of the respondents (56%) agreed that both environmental uncertainty and political factors are highly important for attaining the higher education 2030 vision. For instance, Respondent 2 cited that political factors such as the Qatar blockade where diplomatic and trade ties were cut between Qatar and UAE, Bahrain and Egypt, created uncertainty in the operational environment, as it led to disruption, thereby overlapping on the two factors:

'This blockade has changed the perspective of the country. As something that we did not anticipate, we did not plan for it. So, for instance, if this University QF decides to close its branches, it will have a huge impact on the higher education plan … in general. So, the uncertainties, the unexpected, can change the whole dynamics'. (Respondent 2)

Respondent 14 further believes that the kind of leadership that has been instituted influences environmental uncertainty; changes in leadership, such as appointing a different minister of education, will subsequently affect the attainment of strategic objectives. As an explanation, it was argued that, by changing people (mostly senior leaders), visions and directions are also altered.

However, a counter-argument raised by eight respondents (44%) is that environmental uncertainty and political factors are not important for achieving the higher education 2030 vision. For instance, Respondent 14 highlighted that the change in leadership will not necessarily influence the achievement of strategic objectives and the set vision:

'I have at least witnessed the change of the upper management or leadership even in the country, which did not affect the vision. I believe it did not massively change the way things are going or under taking when it comes to the activities'. (Respondent 14)

Respondent 16 further added that, while disturbances in the operational environment, such as the Covid-19 pandemic, are not related in any way to the political leadership, they influence the attainment of the higher education vision:

'Lots of economic situations that we don't know what will happen … will have a huge impact if it continues for a few months … you will have problems with implementing your strategy, and so on'. (Respondent 16)

Nevertheless, evaluating the findings revealed a consensus in that environmental uncertainty is disadvantageous for the country and negatively influences the higher education sector's ability to achieve its vision. Findings on these two factors corroborate with the literature in Section 2.6, which emphasises the significant impact of politics on decision-making in cyberspace and its overall usage.

6.5.1.3 Technological Advancement

In Interview Question 3 (Appendix A), the Researcher investigated how advanced technology influenced the attainment of the higher education 2030 vision. Accordingly, two important aspects were examined: 1) the role of technology in learning and teaching and 2) the management of institutions.

6.5.1.3.1 Learning and Teaching

Figure 6-22 displays the participants' views regarding how technology for learning and teaching influences the attainment of the higher education 2030 vision:
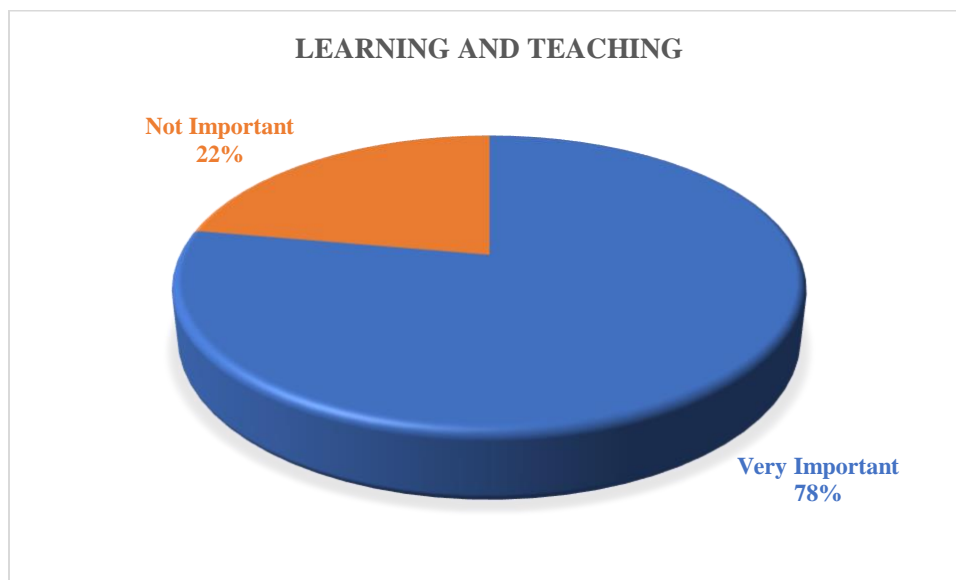
Figure 6-22: Participants' views on technology for learning and teaching.

Source: The Researcher

The evaluation of findings in Figure 6-22 revealed that 14 respondents (78%) identified technology as highly important while four participants (22%) argued that technology is not important for attaining the higher education vision. As the majority of the respondents agreed with the assertion, further analysis revealed the underlying factors that support this view; for instance, participants considered technology to be an enabler of learning, as it allows people to share knowledge with one another. This is confirmed by the literature reviewed in Sub-Section 2.5.2.1 wherein technology-mediated learning and teaching is more enhanced (Pugalee and Robinson, 1998). Respondent 1 specifically highlighted technology's influence on the development of blended learning, asserting the following:

'Taking that into the class room and outside the classroom absolutely, students learn within the classroom, and now, we are talking about blended learning. Allowing students to engage in the classroom, but also, they engage online'. (Respondent 1)

Additionally, findings suggest that technology facilitates establishing smart campuses that would utilise artificial intelligence to guide individuals within the school. For instance, new students could navigate to any room of their choosing simply by typing it into the smart campus system in their app, which would direct them there. Furthermore, Respondent 2 also identified technology as enabling efficient teaching operations, mentioning that exams could be conducted in a paperless manner and marked more quickly and efficiently:

'For example, the condition of processes, paperless. How many exams we can do without paper? We can put all our exams on the computer, and then marking will be quicker'. (Respondent 2)

Participants subsequently demonstrated agreement regarding the need to adopt modern technology in education as global trends move in a similar direction, and they also offered numerous opportunities. The findings are echoed in the literature in Sub-Section 2.5.2.1, where technology for learning and teaching was evaluated, as well as in Sub-Section 3.2.2.1, where cyberspace as a tool of learning was also reviewed. Furthermore, the findings resonate with research in Sub-

Section 2.4.2.2, where Bognar, Sablić, and Škugor (2018) reported that flipped learning also facilitates online discussions and consequently promotes the expression of thoughts and feelings in a friendly manner. Additionally, the findings mirror those by Alamri, Watson, and Watson (2020), who observed that blended learning environments facilitate personalised learning models in higher education, thereby supporting independent research.

However, challenges in adopting the technologies were also cited. For instance, Respondent 16 believes that there is resistance to technology and a lack of strategy to adopt it for learning and teaching purposes:

> 'We will have two types of resistance. We will have people who are not really capable of doing this, and they will find excuses why we should not do this rather than admitting we have an issue, letting us go along and improve ourselves, and moving on in this'. (Respondent 16)

Respondent 12 further emphasised this lack of strategy:

> 'The infrastructure can be, but it has to be driven by the business …. I have seen talks about it, but I have not seen anything in strategy. Now, back to the strategy itself … about method of teaching, improving things'. (Respondent 12)

Based on the responses, challenges such as resistance to technology and the lack of strategy to improve learning and teaching hinder the overall success of technology.

6.5.1.3.2 Management of Institutions

Interview Question 4 (Appendix A) further examined technology's role in improving the management of higher education institutions. Figure 6-23 below displays the participants' views on this role:

MANAGEMENT OF LEARNING

Not Important
17%
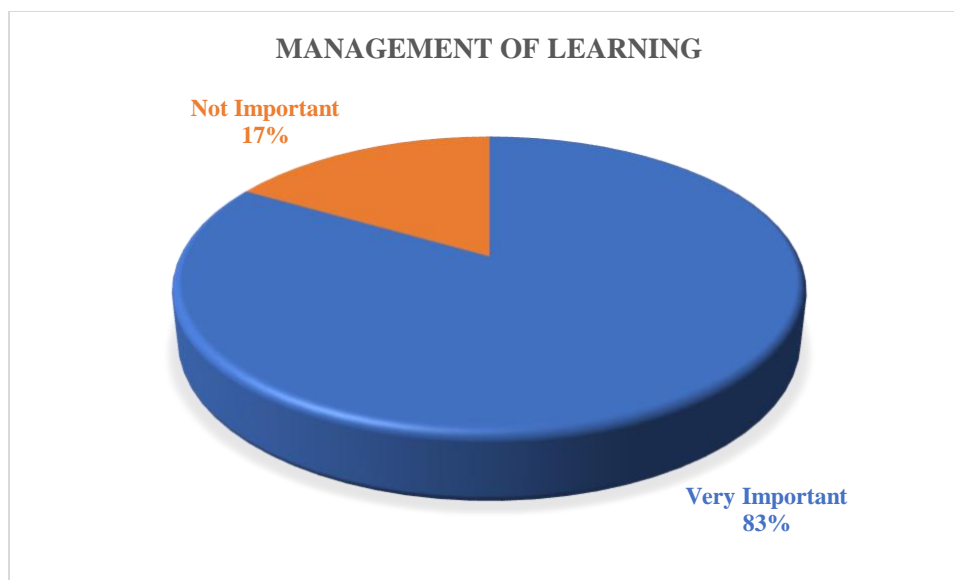
Very Important
83%

Figure 6-23: Participants' views on technology for management.

Source: The Researcher

According to the findings, 15 participants (83%) considered technology to be highly important for managing higher education institutions. Specifically, the reported findings suggest that technology is perceived to highly influence the management of higher education institutions by facilitating decision-making and managing resources. Such findings are confirmed by the literature in Sub-Section 2.5.2.2, where analytics and big data are employed to enhance decision-making (Liebowitz, 2016). Likewise, they mirror the findings by Luo (2019), who reported that using big data to manage student affairs is becoming a common trend in higher education and is advocated for improving normative management and leading to the adoption of scientific decision-making processes.

Respondent 1, meanwhile, cited that technology aids in making difficult decisions to streamline processes due to a decline in oil prices and the Covid-19 pandemic:

> 'We are bracing for major budget cuts now because of the corona virus and also the oil prices' decline. Institutions now need to make really tough decisions and streamline processes to be more efficient and effective; all that could be effectively enabled through technology'. (Respondent 1)

Second, the findings revealed that technology is also transforming administration in higher education institutions. As a result, current management bottlenecks are being effectively addressed. However, Respondent 12 argued that the business side of higher education institutions requires adopting such systems in administration:

'On the administrative level, they facilitate a lot of processes, make things a lot more secure, smoother … everything should be better with technology'. (Respondent 12)

Third, Respondent 18 further believes that technology is transforming management by facilitating learning from previous experiences through the use of analytics and machine learning. In the literature, studies such as the one by Daniel (2014) have cited similar applications of analytics in evaluating student performance. Jha, Jha, and O'Brien (2019) have also reported that tracking student activity data using big data is also important for identifying students who are struggling to complete their course work, thereby leading to lower dropout rates:

'Nowadays, we are more focussed on what happened before. So, we are learning from the previous experience, how we were doing that, using the analytics, using machine learning in order to learn about the behaviours'. (Respondent 18)

The results indicate that technology enables higher education institutions to improve their processes by examining previous experiences via analytics and machine learning. However, three participants (17%) do not consider technology to be important for managing higher education institutions.

6.5.1.4 The QNV 2030 Implementation Framework

In Interview Question 5 (Appendix A), participants were asked how the QNV 2030 implementation framework affects achieving the higher education QNV 2030. In Sub-Section 2.4.1, literature on the QNV 2030 is detailed and its four pillars—namely, human, social, environmental, and economic—are outlined (Qatar National Vision, 2030, 2008). The particular impact of the QNV 2030's implementation framework on human development in terms of enhancement of higher education was examined in this section.

Table 6-6 below presents the word frequency of terms used in reference to the framework (word count of at least two):

Table 6-6: Word frequency and weighted percentage of framework.

Word	Count	Weighted Percentage
Universities	6	0.35%
Implementation	5	0.29%
Communication	3	0.17%
Capabilities	2	0.12%
Consideration	2	0.12%
Institutions	2	0.12%
Sustainability	2	0.12%

Source: The Researcher

The results indicate that the term 'framework' was employed in the context of implementation (0.29%), communication (0.17%), capabilities (0.12%), institutions (0.12%), and sustainability (0.12%).

Figure 6-24 below further displays participants' perceptions regarding the role of the implementation framework for attaining the higher education 2030 vision:

IMPLEMENTATION FRAMEWORK
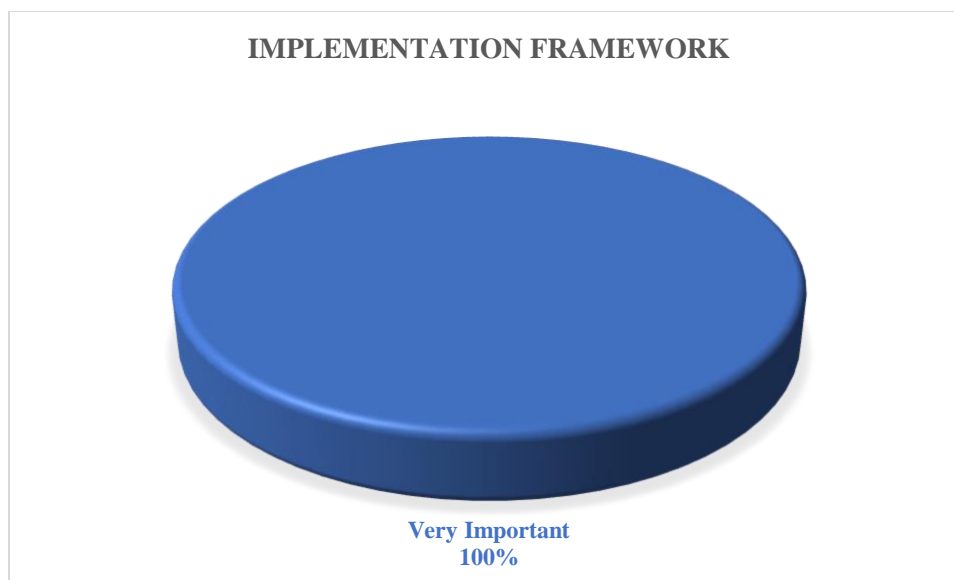
Very Important
100%

Figure 6-24: Participants' views on the role of the implementation framework.

Source: The Researcher

The findings in Figure 6-24 illustrate that all 18 participants (100%) considered the implementation framework to be highly important for achieving the 2030 vision. In support of this finding, Respondent 1 believes that the QNV 2030 has helped shape the future for the development of a knowledge-based economy in the country whereby, instead of relying on hydrocarbons, technology would be employed to build the population's innovative capacities. In this respect, the implementation framework provides a guideline facilitating the uptake of modern technology. The findings are confirmed by the literature in Sub-Section 2.4.2.2 stating that Qatar's education system would modernise the economy by advancing scientific research and boosting learning. To this end, Respondent 1 asserted the following:

> 'Technology that can discover what else is beneath the sand in Qatar. Technology of, you know, tapping into the ingenuity and the capabilities that are in people. So, bring that out in terms of innovation that people can contribute to this'. (Respondent 1)

However, eight participants (44%) stated that, although the QNV 2030 framework is highly important, it does not yet exist; that is, the participants argued that the QNV 2030 framework is not effective, as it does not possess any definite milestones or key performance indicators (KPIs)

to assess what has been achieved overall. Respondent 16 argued that the QNV 2030 is similar to the American dream in that it appears promising only on paper, but not in terms of implementation. Recommendations were subsequently provided to improve the document further, such as by measuring progress made after four years. As Respondent 16 claimed,

> 'For sure, yeah, I think the Vision 2030 obviously is visionary, but each four years, the government will come up with a strategy for those. And at the end of each year, they measure the KPIs, and the end of the four years, they have a report about overall what has been achieved'. (Respondent 16)

The findings thus indicate that there is a need to sub-divide the QNV 2030 into milestones that can be easily measured.

6.5.2 Theme 2: Internal Elements and the Higher Education Vision, 2030 (Q6–Q8)

The second theme, assessed by Interview Questions 6, 7, and 8 (Appendix A), focussed on identifying the relationships between the internal elements within higher education institutions and the attainment of the higher education QNV 2030. Table 6-3 below displays the codes associated with the internal elements:

Table 6-2: Internal elements codes and themes.

Codes	Main Code	Theme
Accountability (Sub-Section 4.7.1.1.1)	Leadership and management strategies (Sub-Section 4.7.1.1)	Internal elements (Sub-Section 4.7.1)
Risk management (Sub-Section 4.7.1.1.2)		
Security awareness (Sub-Section 4.7.1.2.1)	Security policy (Sub-Section 4.7.1.2)	
Continuous learning (Sub-Section 4.7.1.2.2)		
Attitudes and behaviour (Sub-Section 4.7.1.2.3)		

Security skills and knowledge (Sub-Section 4.7.1.3.1)	Security technical and best practices (Sub-Section 4.7.1.3)	

Source: The Researcher

6.5.2.1 Internal Leadership and Management

Interview Question 6 (Appendix A) investigated how internal leadership and management strategies developed in higher education institutions influence the achievement of the higher education 2030 vision. Accordingly, two aspects were investigated: accountability and risk management. Findings from the literature in Sub-Section 4.7.1.1 previously revealed that leaders in different types of organisations must be accountable for both protecting the ethics of the business (Ghanem and Castelli, 2019) and implementing strategies that eliminate risks for the business (Fleming, 2004).

6.5.2.1.1 Accountability and Risk Management

First, a word frequency table for terms used in reference to accountability was developed, as detailed in Table 6-7 (word count at least four):

Table 6-7: Word frequency and weighted percentage of accountability.

Word	Count	Weighted Percentage
Governance	9	3.54%
Educational	4	1.57%
Leadership	4	1.57%
People	4	1.57%
Think	4	1.57%

Source: The Researcher

According to the results, 'accountability' was utilised in the context of the following words: governance (3.54%), educational (1.57%), leadership (1.57%), people (1.57%), and think (1.57%).

Table 6-8 further presents the word frequency of terms used in reference to 'risk' (word count at least two):

Table 6-8: Word frequency and weighted percentage of the word 'risk'.

Word	Count	Weighted Percentage
Decentralised	3	12.50%
Centralised	2	8.33%
Think	2	8.33%

Source: The Researcher

The results indicate that 'framework' was employed in the context of the words 'decentralised' (12.50%), 'centralised' (8.33%), and 'think' (8.33%).

Figure 6-25 further displays the distribution of the participants' views regarding the role of accountability and risk management for attaining the higher education 2030 vision:

Figure 6-25: Participants' views on the role of accountability and risk management.
Source: The Researcher

Evaluating the findings in Figure 6-25 revealed that all 18 participants (100%) considered accountability and risk management to be highly important. However, five respondents (28%) argued that, although risk management and accountability are important, they do not exist in Qatar higher education institutions. Based on a detailed analysis of the responses, respondents believe that the leaders in the organisations possess a responsibility to be accountable for their employees' actions as well as to drive the implementation of different objectives. Respondent 15, for instance,

observed that top management support is essential for providing guidance and support to workers at lower levels:

'The leader is responsible for giving clear guidelines for the employees'. (Respondent 15)

A similar view was also reiterated by Respondent 11:

'If they are not trained, they should be trained. If they are not aware, there should be kind of campaigns and seminars and workshops to make them more aware. If they need resources, then they need to be supported by resources'. (Respondent 11)

The discussion between Respondents 15 and 11 concerned the fact that leaders play a role in guiding employees and must accordingly be well trained and provided with the resources necessary to execute the different objectives. The findings confirm the literature in Sub-Section 4.3.2, where Schein (2013) argued that leaders guide their employees' actions.

Second, in regard to risk management, Respondent 4 highlighted that the strategies from leadership are integral for eliminating risks by ensuring that things are done properly and identifying aspects that need to be corrected in order to meet expectations. Ensuring efficiency in higher education institutions would enhance the attainment of the higher education QNV 2030. Respondent 2 further argued that adopting decentralised systems is important for minimising the effects of risks. In the current scenario, the respondent cited that higher education institutions feature too much centralisation, asserting that

'We live in a very much centralised government, and institutions are also all centralised. For example, when you come to the Qatar University, the president has not only the ultimate power'. (Respondent 2)

A third finding, highlighted by Respondent 3, is that governance and risk management in higher education institutions represent a collaborative responsibility between different departments and should not be left to only one group:

'It is not a job of one, let us say, role or one department, or it is not their job. So, I think it is a joint role that everyone should think of'. (Respondent 3)

The discussion between Respondents 3 and 2 regarding the need for collaboration among leaders echoed the literature in Sub-Section 2.8.1 indicating that trust and co-operation are required between different entities to establish a beneficial working relationship (Silver, 2016).

Fourth, it was also reported that a clear implementation plan is crucial for managing any changes arising from a change in leadership and management. Respondent 6 vouched for mature implementation frameworks to facilitate the achievement of strategic goals. Such frameworks would outline the necessary KPIs that would highlight progress made.

As Respondent 6 stated,

'Therefore, you need to have someone at the top who has a very good vision and like this to establish, and the continuity is very important'. (Respondent 6)

Implementation metrics and models from literature were previously reviewed in Sub-Section 2.8.3, where their value for attaining strategic goals was reported.

Nevertheless, the fifth finding revealed that considerable emphasis is placed on skilled, effective, and competent leadership. Additionally, some participants also highlighted the importance of having young leaders aged 30 to 50 years to move the institutions forward.

6.5.2.2 Security Technical and Best Practices

Interview Question 7 (Appendix A) investigated how security technical and best practices influence the attainment of the higher education 2030 vision. The quadrant III analysis of the literature in Sub-Section 3.2.4 revealed that aspects such as learning and content creation in cyberspace are guided by best practices on the international platform. The synthesis of findings in this section yields important insights regarding how adopting security technical and best practices influence the achievement of the higher education 2030 vision. A word frequency table was

subsequently developed to identify terms used in reference to best practices (word count of at least seven). Table 6-9 details the results below:

Table 6-9: Word frequency and weighted percentage of best practices.

Word	Count	Weighted Percentage
Practices	21	2.67%
Culture	9	1.15%
Right	9	1.15%
University	8	1.02%
Awareness	7	0.89%
Example	7	0.89%
Policies	7	0.89%
Practice	7	0.89%
World	7	0.89%

Source: The Researcher

The results indicate that the word 'framework' was employed in the context of practices (2.67%), culture (1.15%), right (1.15%), university (1.02%), awareness (0.89%), example (0.89%), policies (0.89%), practice (0.89%), and world (0.89%).

The findings underscore the importance of best practices in Qatar's current social-cultural context when adopting them from other international countries. For example, Respondent 2 cited that a professor riding a bicycle in Qatar would be unacceptable despite being accepted in regions such as Japan. As such, for best practices to work well within the country's higher education sector, alignment and further modification are required.

As Respondent 2 explained,

> 'If any system fails here, it is not because it's bad, but because it does not fit and align with our social norms. So, the best thing to do is to take inspiration and see how we can modify it so that it best fits according to our acceptable conditions'. (Respondent 2)

Respondent 4 shared a similar view, arguing that it is not sufficient to simply apply the best practices in an institution; rather, the proper types of practices must be adopted to achieve set goals. Additionally, the respondent also mentioned the need for guidelines and procedures to implement best practices:

'We need to have guidelines, handmade policies and procedures, because this is new, the culture is new, and in order to implement it the right way, we need to have some support'. (Respondent 4)

The discussion between Respondents 2 and 4 underscored the need for not only adopting the proper types of best practices, but also aligning them with cultural and social contexts to guarantee their success.

In contrast, Respondent 7 argued that best practices benchmarked from other countries represent their own method of achieving goals. As such, there is a need for Qatari institutions to develop their own best practices that consider their budgets, initial goals, and operational goals. However, this view was critiqued by Respondent 6, who pointed out the need to build practices from what others have done as opposed to beginning from scratch:

'You do not start from scratch; you look for best practices, you look for other experience in the same area in Qatar, or in the regions, and you build on that one with what you need in your institute'. (Respondent 6)

The aforementioned view held by Respondent 6 has been previously reported in the literature; specifically, reliance on third-party best practices in higher learning institutions was emphasised in Sub-Section 3.2.4. Moreover, previous findings suggest that the use of the practices is motivated by the inherent security and innovative capabilities (Gregg *et al.*, 2017). However, from the discussion, new findings on aligning best practices with cultural contexts have also been reported.

Further review revealed the various processes that institutions employ to create best practices, such as searching for current best practices and finding ways to customise them for a university in research centres. Respondent 9, for instance, highlighted the role played by research organisations and the ICT sector in developing the best practices employed by higher education institutions:

'Since I joined the university, we always searched for the best practice, and we check how this can be adapted and how can we customise it to be implemented here at the university'.

'I believe that country policy, including the cyberspace of Qatar, I believe it's not the university's prime job or business, but it's the ICT sector's'. (Respondent 9)

From the reported findings, it was observed that research institutions and the ICT sector play an integral role in the development of best practices adopted in higher education institutions.

6.5.2.3 Security Policy

Interview Question 8 (Appendix A) investigated the role that internal security policies implemented in higher education institutions play in the attainment of the higher education 2030 vision. To this end, three aspects were considered: attitudes and behaviour, continuous learning, and security awareness.

6.5.2.3.1 Attitudes and Behaviour

Figure 6-26 below displays the respondents' views regarding security skills and knowledge:

Figure 6-26: Participants' views on security skills and knowledge.

Source: The Researcher

Figure 6-26 indicated that 16 respondents (89%) considered security skills and knowledge to be highly important, and thus influential to employee behaviour and attitudes. For instance, Respondent 3 cited that, to effect behaviour change, regulations and policies should be created to serve as guidelines. Findings from the literature reviewed in Sub-Section 3.2.1.2 likewise revealed that cyberspace represents a unique cultural concept that influences the experiences and interactions of individuals who inhabit it, and guidelines are consequently required to protect these interactions.

As Respondent 3 asserted,

'I think the policies and procedures will make it clear to everyone what is going on and what they need to follow'. (Respondent 3)

A similar view was also reported by Respondent 13, who emphasised ensuring that security policies remain positive, clear, and easily understood. The argument was that having positive regulations will influence employees' attitudes:

'Of course, yes, it is very important if you have the right policy and the right procedure, and that means that you are on the right track'. (Respondent 13)

The discussions between Respondents 13 and 3 underscored the need for clear security policies to guide employees' behaviour within an institution. However, Respondent 7 argued that their creation is deterred by the bureaucracy involved in making changes to the existing policies, as they are not dynamic:

'Our problem is we have this tornado of committees on top of committees on top of committees. As a result, there is a lot of routine, and in order to change something, you need a lot of approvals …. I think is really hindering us from having the dynamic type of regulations and policies'. (Respondent 7)

Additionally, Respondent 18 argued that culture influences employees' attitudes regarding the adoption of different rules and regulations. Furthermore, the respondents cited that some cultures more readily adhere to set regulations than others, thus indicating a need to contextualise rules and policies relative to Qatar's culture.

As Respondent 18 explicated,

'I mean, you can never create a set of rules that are applicable in any organisation anywhere and so generic that it affects everyone'. (Respondent 18)

Respondent 18's claim that culture influences employees' attitudes regarding rules and regulations echoes previous literature in Sub-Section 2.2.4, where culture was observed to influence individuals, groups, and entire societies (Eliot, 2014; Spencer-Oatey, 2008). As such, the need remains for contextualisation of policies and rules adopted from other types of organisations to achieve success within a particular firm. However, two participants (11%) considered security skills and knowledge to be unimportant, and thus not influential on employees' attitudes and behaviour.

6.5.2.3.2 Continuous Learning and Security Awareness

Figure 6-27 displays the findings obtained regarding the second factor—namely, continuous learning and security awareness:

Figure 6-27: Participants' views on security awareness and continuous learning.

Source: The Researcher

From the reported findings, it was observed that all 18 participants (100%) considered continuous learning and security awareness to be highly important for achieving the higher education 2030 vision. In support of these findings, Respondent 3 cited that continuous learning is important for improving the efficiency of higher education institutions, as it is iterative in nature. Therefore, because institutions constantly review their processes, this eventually leads to better results. Additionally, the findings from the literature in Sub-Section 3.2.5 regarding the quadrant IV analysis previously revealed that digital technologies are dynamic in nature, resulting in a need for educators and teachers to develop dynamic identities that align with the changing technology (Martin-Albo and Gregorio-Godeo, 2017). Such findings emphasise continuous learning for the different actors in cyberspace.

As Respondent 3 asserted,

> 'Kind of an iterative, you revisit what you are doing, and then, if this needs a change, then you do the change and continue. So, I think this will lead to a better result'. (Respondent 3)

Respondent 18 added that continuous learning is important due to the constant dynamic changes that occur in the cybersecurity world, which require employees to remain abreast of new changes and developments. In the same vein, it was also mentioned that governments and institutions are required to create dynamic policies that are adaptable to changes in either the economy or the environment. Likewise, the findings from the literature in Sub-Section 2.2.2 previously highlighted that cyberthreats are constantly being advanced, meaning employees must continuously keep abreast of strategies to mitigate them.

As Respondent 18 stated,

> 'Setting rules or policies that are fixed is the fastest way to failure … when you do procedures and processes, you did them with your own experience with what happened to

you and what is the best that you can imagine. But then, things happen in between. Some special cases happen, some economic changes happen, so you need to adapt to these things'. (Respondent 18)

The implication of the findings is that increased emphasis is placed on consistent adaptation and improvement of policies. This stems from the fact that the cybersecurity world experiences dynamic changes and, as a result, employees must remain up to date regarding new developments.

Regarding security awareness, participants linked this to continuous learning and the need to consistently keep one another abreast of the changes taking place in the market. In the higher education context, this suggests that employees are required to keep updating their knowledge on security aspects in order to facilitate delivery of the higher education QNV 2030.

6.5.3 Theme 3: Culture and the Higher Education QNV 2030 (Q9 Appendix A)

The third theme shifted its focus towards examining how culture influences attaining the higher education 2030 vision. In Interview Question 9 (Appendix A), respondents were accordingly asked to describe how culture influences the attainment of the vision. Table 6-10 displays the various codes associated with this theme:

Table 6-10: Culture codes and themes.

Codes	Main Code	Theme
Culture dimensions (Sub-Section 4.7.3.2)	Dimensions of culture (Sub-Section 4.7.3.2)	Role of culture (Sub-Section 4.7.3)
Values Visible processes Attitudes and behaviour (Sub-Section 4.7.3.1)	Levels of culture (Sub-Section 4.7.3.1)	

Source: The Researcher

6.5.3.1 Role of Culture in General

Although Table 6-10 displays two main culture categories (levels and dimensions), the participants discussed the two aspects together. First, a word frequency table of terms utilised in reference to culture was developed (word count of at least, 25), as presented in Table 6-11:

Table 6-11: Word frequency and weighted percentage of culture.

Word	Count	Weighted Percentage
Culture	57	2.96%
People	53	2.75%
Think	33	1.71%
Change	27	1.40%
Students	26	1.35%

Source: The Researcher

The obtained results indicate that 'framework' was used in the context of the following words: culture (2.96%), people (2.75%), think (1.71%), change (1.40%), and students (0.12%). These results suggest that culture is affiliated with individuals, change, and students.

Figure 6-28 displays the participants' views regarding the role of cultural influence for the attainment of the higher education 2030 vision:
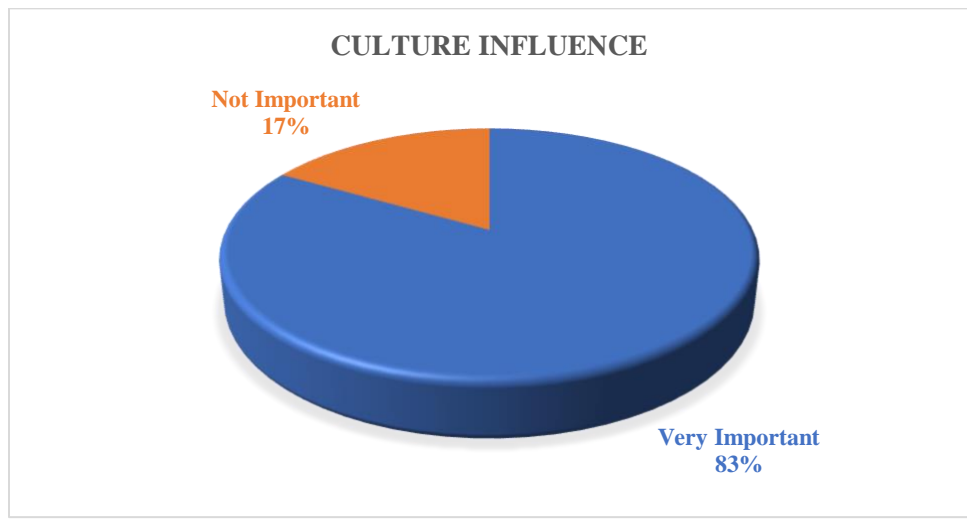
Figure 6-28: Participants' views on the role of cultural influence.

Source: The Researcher

From the analysis of Figure 6-28, only three participants (17%) disregarded culture's influence on attaining the higher education 2030 vision. However, the majority of them—15 participants (83%)—considered culture to be highly important. For instance, as Respondent 6 claimed,

'Yeah, I think the culture of the people is a very important component'. (Respondent 6)

Respondent 3 held a similar view regarding culture and leading change:

'Yes, the culture has a big importance, actually, because at the end, they are leading the change'. (Respondent 3)

Respondent 5 added that culture plays an influential role in attaining success:

'Culture is one of the most important factors that could either drive the success or failure of the achievements or goals'. (Respondent 5)

The discussion between Respondents 6, 3, and 5 is confirmed in the literature in Sub-Section 2.2.5, where cyberspace culture facilitates knowledge construction (Haarmann, 2007) and advanced use of technology (Zeng *et al.*, 2016). However, approximately 17% of the respondents did not agree with the views, stating that culture does not exert any influence on the achievement of the higher education 2030 vision.

Respondent 3 further believed that the culture of individuals in an organisation must be aligned with changes to be introduced. For this reason, the respondent argued that, in order for cyberspace culture to be introduced successfully, an organisation must emphasise its value to members:

'So, you cannot implement something new and then fail to use it, or you just wasted your time. So, I think they need to be engaged from the beginning and understand what is going on. Then, they will support or start to support and believe in this change'. (Respondent 3)

Furthermore, Respondent 1 identified various challenges affecting the creation of a conducive cyberspace culture in the context of Qatar. For one, Qatar possesses a conservative social and cultural background that is strongly influenced by religion. As a result, educators would be challenged in gaining their learners' trust to use online tools for education purposes.

As Respondent 1 stated,

> 'You know, Qatar overall is a conservative cult culture based on religion, and also on culture and tribal society'. (Respondent 1)

Respondent 1 further added that technology is intrusive:

> 'And now, with the intrusion of technology in homes, for example, you can just turn on my camera now, and you get to see everything that is around me; you get to see my family, perhaps people without a hijab at home'. (Respondent 1)

The views by Respondent 1 align with the literature identifying internet culture as both chaotic in nature and bringing about cultural shocks and lifestyle changes (Gunter, 1995).

Second, Respondent 2 added that culture is formed over a long duration of time, and more time is thus required for new changes to be implemented:

> 'And this culture is built over time …. We at Qatar University have our own way of doing things. And our ways of doing things were developed from day one; now if we want to change this, it takes time'. (Respondent 2)

However, Respondent 10 argued that introducing more time also produces more risks, such as resistance to change. An example highlighted included faculty resistance towards the newly introduced blackboard system, with the faculty's age identified as the main deterrent to the system's adoption:

'So, you will always face resistance, especially in the educational sector, the university sector, because of the age, maybe, of the faculty'. (Respondent 10)

The discussions between Respondent 2 and Respondent 10 regarding the slow pace of culture formation and experienced risks are confirmed in the literature in Sub-Section 3.2.1.1, where the abstractness of cyberspace was identified and the difficulty in creating rules of interaction was observed.

Third, Respondent 8 observed that culture is important not only within an organisation, but also outside it and within the community. The suggestion was that, even if organisations succeed in fostering a positive cyberspace culture, input from the external environment, if not considered, will negatively influence the developed culture.

Respondent 8 added,

'Actually, yes, I do believe that culture is very important and that culture has two levels'.

A fourth identified challenge concerned the lack of basic computing knowledge among many students in Qatar universities. This would indicate that creating a cyberspace culture is not feasible, as students have yet to understand the basics of computing. The literature findings in Section 2.8 identified similar gaps in the creation of cyberspace culture and in guiding the use of technology. Furthermore, Respondent 10 argued that, without a basic understanding of computing, students would be more vulnerable to adopting negative cultures in cyberspace:

'There is a huge problem with using technology. Some students do not know even how to open their laptops; they do not know how to scan it, for example, and the number of such students is not small'. (Respondent 10)

'I had students who did not know how to send an email .... And this all is happening in 2020'. (Respondent 10)

Nevertheless, despite the different challenges highlighted, some of the participants offered recommendations for fostering a positive cyberspace culture. For instance, Respondent 14 emphasised the importance of leaders taking a central role to foster a positive cyberspace culture by adopting more effective change management practices. Similarly, they also cited the need for education on cyberspace aspects:

'The management, or the leadership, needs to put more effort into the change management to reach the minds of the people supporting them and let them allow them to support the management to achieve'. (Respondent 14)

In addition, Respondent 12 highlighted the need to educate people:

'You have to educate people and families. To familiarise them with a culture that, yes, we will provide you all this, but it is not going to be so easy for you'. (Respondent 12)

The discussions between Respondents 14 and 12 emphasised the role played by leadership in fostering culture among people. This role was likewise confirmed in the literature in Section 2.6 regarding the guiding principles of rule-making for cyberspace culture.

A third solution by Respondent 5 involved facilitating culture change by changing the mindset of the individuals and promoting campaigns of social behaviour change using change management techniques. This respondent also cited the need for collaboration between the education sector and the Ministry to equip students with better technology skills:

'Yes, usually, leaders who are focussing on tools and technologies and so on, and ignoring the culture, most probably would fail'. (Respondent 5)

Based on these findings, the key argument is that, in order for technology and tools to work as required, building the proper culture is crucial. Similar views have also been emphasised in the literature in Section 2.6 regarding the guiding principles of rule-making for cyberspace culture and in Sub-Section 3.2.1.2, where culture was perceived as a unique cultural concept.

6.5.4 Theme 4: Proposed Cyberspace Culture Framework (Focus Group Q1 Appendix A)

The fourth theme sought to validate the proposed framework in aligning cyberspace culture with the higher education 2030 vision. As such, participants engaged in a focus group discussion regarding the validity of three components of the proposed framework (internal, external, and culture). Table 6-12 lists the various themes and codes that were considered:

Table 6-12: Cyberspace culture framework codes and sub-themes.

Codes	Theme
Internal elements (Sub-Section 4.7.1)	
External elements (Sub-Section 4.7.2)	Alignment of cyberspace culture framework with the H.E. vision
Culture (Sub-Section 4.7.3)	

Source: The Researcher

6.5.4.1 Internal Elements

With the internal elements, the participants discussed how they aligned cyberspace culture with the achievement of the higher education QNV 2030.

6.5.4.1.1 Leadership and Management Strategies

The participants agreed that this factor is influential for achieving the higher education QNV 2030, as leaders are responsible for steering their organisations towards achieving the objectives. Additionally, holding management accountable for actions undertaken by the institutions would pressure them to lead the firms in the appropriate directions. Such findings confirm the literature in Sub-Section 4.3.2, where Schein (2013) argued that leaders guide their employees' actions. Moreover, they also echo previous findings in Sub-Section 4.7.1.1, which previously revealed that leaders in different types of organisations must be accountable to protect the ethics of the business and eliminate risks.

As focus group Respondent 4 explained,

'So, if people on the management level will be held accountable, I guess the objectives that they will be achieving, I think we will be doing well; we have a clear path'. (Focus group Respondent 4)

Focus group Respondent 2 further added that the universities in which they worked had already taken steps to ensure accountability and minimise risks, such as by developing strategic plans and instituting a risk register to identify all possible risks and their respective corrective actions. However, the respondent also emphasised the need for frameworks to facilitate this alignment:

'But the point is what framework we are going to utilise in order to make sure our strategy is effective'. (Focus group Respondent 2)

The findings suggest a need to adopt frameworks to enhance accountability among higher education participants. In addition, focus group Respondent 5 acknowledged that accountability describes a mechanism that ensures work is performed correctly.

6.5.4.1.2 Security Policy

Regarding security policy, first, participants highlighted the importance of security policies for aligning cyberspace culture to the attainment of the higher education QNV 2030, such as by renewing security certificates like ISO to ensure compliance. Second, they recommended creating awareness among the employees of organisations, such as by developing email campaigns and offering external training regarding the importance of cybersecurity. Similar findings were previously reported in the literature in Sub-Section 3.2.5, where the quadrant IV analysis revealed that digital technologies are dynamic in nature and, as a result, there is a need for educators and teachers to develop dynamic identities that align with the changing technology (Martin-Albo and Gregorio-Godeo, 2017).

As an illustration, focus group Respondent 1 cited that some employees are prone to leaving their computers unlocked and sharing privileged university accounts with multiple individuals. Such

habits were identified as highly dangerous to the information integrity within the university, and awareness should thus be created among employees:

> 'We need to align our employees; we need to provide awareness. The point is, most of the employees, maybe, they are not highly aware about security'. (Focus group Respondent 1)

Furthermore, focus group Respondent 4 asserted that

> 'There is an issue and another initiative emerging from external environments or from the MOI, and it involves giving trainings to a lot of people on cyber security in the university. So, we're working on that'. (Focus group Respondent 4)

In addition to offering training and sharing awareness campaigns, focus group Respondent 3 also highlighted the need to provide security information to employees:

> 'I think, effective security awareness measures, but there is a part lacking, which is making sure that information is there'. (Focus group participant)

Fourth, alignment could also be enhanced by providing a sense of purpose to employees in order to create a mindset centred on a positive security culture.

The discussions between Respondents 1, 3, and 4 indicate that creating awareness and offering training are pivotal for enhancing cybersecurity. Moreover, the findings echo the previous literature in Sub-Section 3.2.1.2, which revealed that the uniqueness of cyberspace further necessitates the development of guidelines to protect interactions among its actors and inhabitants.

6.5.4.1.3 Security Technical and Best Practices

Regarding best practices, participants cited that such practices are useful for aligning cyberspace culture with the attainment of the higher education QNV 2030. These findings were confirmed by previous literature, whereby the quadrant III analysis in Sub-Section 3.2.4 demonstrated that aspects such as learning and content creation in cyberspace are guided by best practices on the international platform.

Focus group Respondent 2 highlighted two examples of best practices: 1) saving files in the cloud as a backup, as opposed to local disks, which are susceptible to damage or theft, and 2) maintaining backups as a means of enhancing the efficiency of universities and, subsequently, to positively affect the attainment of the vision.

Specifically, focus group Respondent 2 asserted that

'You start working on something, a laptop, but you don't use best practices of saving your files in the cloud and keeping them updated, etc. And one day, your laptop crashes; you have lost everything you worked on'. (Focus group Respondent 2)

Focus group Respondent 4 also highlighted the creation of security policies as a best practice to ensure accountability among employees:

'Put some policy in the place, then make awareness, and after the awareness, you can now start saying if they are complying or not complying with it, but you need to take care of them; then, you make them accountable'. (Focus group Respondent 4)

Furthermore, focus group Respondent 1 emphasised the role of privacy and awareness:

'If someone enters our website, we can enter your privacy. They will think about it … we need to invest more in the policy infrastructure of the university, then after that, raise a lot of awareness'. (Focus group Respondent 1)

The discussion between Respondents 1, 4, and 2 demonstrate that participants place importance on creating awareness regarding different security issues as a best practice to guarantee employee accountability and improve security in higher education institutions. Likewise, in the literature, Alnatheer and Nelson (2009) also emphasise creating security awareness by offering training programmes and implementing security policies.

6.5.4.2 External Elements

Furthermore, the participants also discussed how the external elements aligned cyberspace culture with the achievement of the higher education QNV 2030.

6.5.4.2.1 The QNV 2030 Directives

Regarding the QNV 2030 directives from the government concerning strategy formulation for higher education institutions, participants agreed that the directives align cyberspace culture with the achievement of the higher education 2030 vision. First, they observed that the government's external pressure and economic strategies play a major role in education. One of the participants mentioned that a reason for the government's pressure on education arose from global changes in technology and the need to adopt an education-based economy. The findings are confirmed by the literature in Sub-Section 2.4.1 stating that Qatar's government developed the QNV 2030 as a strategy to modernise the country by ensuring growth in all sectors (economic, social, environmental, and human).

As focus group Respondent 1 explicated,

> 'Definitely, the economic factors and the external pressure will play a big role'. (Focus group Respondent 1).

Focus group Respondent 3, meanwhile, added the following:

> 'That's why they're trying to put the pressure on the education, because they are thinking that this generation should change the whole country and the whole economy. Now, the economy is changing'. (Focus group participant)

Focus group Respondent 5, however, claimed that pressure from the government, such as to ensure compliance with global data protection rules like the GDPR, stems from the fact that the government funds most operations in the institutions. This view is confirmed by the literature in Sub-Section 3.2.2.1, which indicates that infrastructural investments are necessary to enhance the role of cyberspace as a tool of learning.

Focus group Respondent 5 stated the following:

> 'As long as the government pays the universities to operate, then they will have some control'. (Focus group Respondent 5)

However, focus group Respondent 6 argued that the leadership in higher education is fragmented, thus making it difficult to align cyberspace culture with the vision's achievement, as different institutions are on different technology levels. The suggestion was that various challenges still need to be tackled before the government's leadership strategies can align cyberspace culture with the achievement of the higher education QNV 2030.

To this end, focus group Respondent 6 asserted the following:

> 'I don't think there is a leadership in higher education. We have a fragmented leadership; you have the issue, but the university has leadership, and you have other leadership … and we're not all on the same page … that's why we're suffering now in achieving and aligning our jobs with the outcomes that the Ministry of Education is trying to push us to achieve'. (Focus group Respondent 6)

Furthermore, participants reported that alignment could be fostered by the Ministry of Education protecting institutions' academic freedoms. Regarding political factors, the findings revealed that some of the participants believe that new leadership is likely to change operations in higher education institutions by disregarding what their predecessors have done. However, others argued that some leaders will continue the previous work, albeit with tweaks and improvements. The discussions regarding how political factors influence the attainment of the higher education vision mirror the findings from the literature in Section 2.7, where the openness of cyberspace culture was identified and the need to create rules to govern it were reported. Likewise, the discussion also echoes findings in Section 2.6, where guiding principles on rule-making in cyberspace were further outlined.

The general consensus among participants is that the government plays an important role in formulating leadership strategies that later facilitate aligning cyberspace culture with the achievement of the higher education QNV 2030. Leadership is accordingly viewed through economic incentives, external pressure, and policies developed.

6.5.4.2.2 Technological Advancement

The participants agreed that technological advancement facilitates aligning cyberspace culture with the achievement of the higher education QNV 2030, as this advancement represents an integral component for transforming how teaching and learning are accomplished in Qatar universities. In effect, participants argued that technology has the potential to entirely transform how education is approached in Qatar. The findings regarding the opportunities of technology-mediated learning are echoed in the literature in Sub-Section 2.5.2.1, where technology for learning and teaching was evaluated, as well as in Sub-Section 3.2.2.1, where cyberspace as a tool of learning was also reviewed.

Focus group Respondent 2 asserted the following:

> 'Absolutely, it's maybe the main driver for change in our education system … this will allow us to transform the way we are giving lectures here in Qatar university'. (Focus group Respondent 2).

Focus group Respondent 1, however, argued that technology will not necessarily help improve teaching, as some courses cannot be taken online:

> 'Yeah, exactly. There are even courses that are non-transformable to online. You just can't. You just need to deliver them traditionally'. (Focus group Respondent 1).

The implication is that several participants within educational environments will not interact in cyberspace, as technology is not effective. Focus group Respondent 3 further identified bureaucracy as a factor that influences the implementation of technology-based learning and teaching, as some projects have yet to be started since their institution in September of 2018:

'After several years in Qatar university, I felt that the main problem is not the will to change, but that paperwork, the bureaucracy, that comes with applying these things. You come with the idea, "Let's do this. Let's do it, everybody's happy. Yeah, let's start", and then it gets delayed'. (Focus group Respondent 3).

Therefore, although technology advancement could align cyberspace culture with the achievement of the higher education QNV 2030, the discussions between Respondents 3 and 1 indicate that issues such as bureaucracy and the difficulty in transforming some courses into online platforms further affect this alignment.

6.5.4.2.3 The QNV 2030 Implementation Framework

Regarding the implementation framework aligning cyberspace culture with the achievement of the higher education QNV 2030, focus group Respondent 2 identified a key weakness in the lack of performance measures in the framework, making it difficult to align the two:

'But it's still. There are a lot of question marks, like when it comes to the identity and citizenship. For example, we couldn't align ourselves to it, because we don't know how to measure the loyalty and citizenship'. (Focus group Respondent 2).

Focus group Respondent 3 shared a similar view:

'It's like, since it's a vision for, 22 years, that's very difficult'. (Focus group Respondent 3).

The argument is that, although the QNV 2030 implementation framework provides a guideline for implementing the higher education QNV 2030, it nonetheless lacks performance measures, thus making it even more challenging to align cyberspace culture. Participants subsequently emphasised the value of adding performance indicators. The discussion between the participants regarding the lack of milestones for the QNV 2030 is also echoed in the literature in Sub-Section 2.4.1, wherein only the four pillars of development were outlined—human, social, environmental, and economic—without any indication of milestones to assess their completion.

6.5.4.3 Culture

The final discussion concerned the various ways in which culture aligns cyberspace culture with the achievement of the higher education QNV 2030. Participants largely discussed the various solutions that could be adopted to alleviate the current issues affecting the cultivation of a positive cyberspace culture. First, focus group Respondent 3 highlighted the role of developing implementation plans to overcome employees' resistance to change. Such implementation plans were conceptualised as frameworks in the literature in Section 2.6 to govern the usage of cyberspace.

First, focus group Respondent 3 asserted the following:

'And I guess, part of our implementation … not only in Qatar, but everywhere … even the human resisted change. So, this should be about the plan of implementation, how to overcome the changes' resistance'. (Focus group Respondent 3)

Second, focus group Respondent 4 identified the need to change employees' mindsets by highlighting the value of proposed changes:

'We need to share what they will gain from it … for that organisation or to accept it, and to take it as agreed behaviour'. (Focus group Respondent 4)

Based on the findings, a need exists to share the value of proposed changes in order to encourage employees to accept changes to their behaviour. Such findings are mirrored in the literature in Sub-Section 3.2.4, where the need to create frameworks to guide the actions of actors in cyberspace was emphasised.

6.5.4.4 Validation of the Proposed Framework (Figure 4-7)

After evaluating the different components of the proposed cyberspace culture framework, participants were asked to validate how the different elements influenced cyberspace culture. The general consensus is that the framework is valid in explaining the alignment between cyberspace culture and the attainment of the higher QNV 2030. However, some participants argued that some of the relationships between the variables are not bi-directional, as displayed in Figure 4-7. One

such example involved the external elements, where focus group Respondent 3 argued that external elements are difficult to affect in a backward manner:

> 'If you look at leadership, it is, but if you look at the two points, physically, you cannot force updates on external pressure or force updates on economic factors'. (Focus group Respondent 3).

This finding implies a need to modify the proposed cyberspace culture framework (Figure 4-7) to incorporate only uni-directional effects, such as with external pressure and economic factors. However, for the majority of the components, a bi-directional relationship would be retained, as the factors both affect the attainment of the 2030 vision and are likewise affected by its achievement.

Furthermore, the framework's validation by the participants suggests that the theorised effects of each individual factor are confirmed in higher education institutions. Therefore, the Researcher identifies various uses of the proposed framework in streamlining the attainment of the higher education 2030 vision.

6.6 Conclusion

This chapter detailed the results and analysis of the primary data collected in this research. In the first section, the data analysis techniques adopted in the chapter were discussed. As thematic analysis was largely utilised and its basics were briefly described, along with a breakdown of how data would be evaluated in the chapter. The second section then presented participants' demographic details and professional experience; most of the interviewees held senior roles in higher education, such as managers and directors, and had also worked in those roles for more than five years. Such findings underscore the validity and robustness of the participants' responses, given that they are well experienced in higher education. The third section featured the thematic analysis of the different interview responses. Based on the analysis, the importance of the different elements of the proposed framework was identified, and the findings demonstrate that participants validated the proposed framework and highlighted several adjustments.

The conclusion from the data analysis is that the participants identified the three framework components—external, internal, and cultural—as factors that influence the attainment of the higher education QNV 2030. External elements, such as the government's QNV 2030 directives regarding information policy and leadership in terms of the higher education sector's external pressure and economic viability, were identified as critical for determining the overall progress attained. Likewise, according to the findings, technological advancement facilitates learning and teaching by transforming the traditional classroom. The QNV 2030 was also identified as influential for developing cybersecurity frameworks, such as the Qatar 2022 World Cup framework. Moreover, internal elements within institutions are associated with the attainment of the higher education QNV 2030, as leaders steer their institutions to achieve different goals.

However, apart from input from leaders, best practices and security policies were also emphasised as influential elements for achieving the QNV 2030 in higher education. For one thing, best practices will help institutions avoid developing their policies from scratch while security policies will ensure employees remain aware of loopholes leading to security vulnerabilities in the institutions. Finally, culture was identified as a critical aspect for achieving the QNV 2030, as Qatar is highly influenced by religion and culture. Therefore, insights were provided concerning how culture can be changed to facilitate attaining the higher education QNV 2030. In the following discussion (Chapter 7), the findings are explored in greater detail.

Chapter 7: Discussion

7.1 Introduction

The previous chapter detailed the findings from interviews with the research participants in a descriptive manner. To this end, the Researcher delineated important insights regarding how each research element (internal, external, and culture) influences the attainment of the 2030 higher education vision. As the findings were largely descriptive, this chapter evaluates them thematically so as to identify useful interpretations to help address the formulated research questions. In this regard, thematic analysis is employed to explore patterns and themes in the reported data, thus generating the necessary research insights (Smith and Sparkes, 2016). Furthermore, the findings are critically compared against current literature works in order to identify similarities to and differences from other related studies. The research questions addressed in this chapter (refer to Section 1.6) are as follows:

1. How does cyberspace culture strategically align with the country's strategic directions?
2. How are current cyberspace culture frameworks aligned with the country's strategic directions?
3. Why is cyberspace culture important, and what gaps exist in the literature regarding cyberspace culture?
4. What type of cyberspace strategy should the government deploy to align with the country's strategic directions?

The chapter is subsequently organised into three key sections: Section 7.2 presents the analysis of themes in order to extract important interpretations from the interview data. Following this, Section 7.3 discusses the key findings obtained from synthesising the interview data. Continuing, Section 7.4 explains the revisions to be implemented in the proposed cyberspace culture framework in order to align its components with the achievement of the 2030 higher education vision in Qatar. Finally, the conclusion is detailed in Section 7.5, delineating how the research questions were addressed and the research aim achieved.

7.2 Thematic Analysis of Research Findings

In performing the thematic analysis of the interview data in the Nvivo 12 application, the Researcher employed tools such as word frequency tables to understand the context of the ideas

generated by the respondents. However, as the proposed cyberspace culture framework (Figure 4-7) guided the development of interview questions, the research themes considered for the analysis were already known beforehand (Oh, 2018). Accordingly, the interview questions (Appendix A) were further grouped in alignment with the themes (Table 7-1). In turn, this implied that the thematic analysis would be directed as opposed to conventionally producing coding categories from the raw data during data analysis (Pietiläinen *et al.*, 2017).

In the proposed cyberspace culture framework (Figure 4-7), three main elements were identified to influence the attainment of the 2030 higher education vision: external elements (Chapter 4, Sub-Section 4.7.2), internal elements (Chapter 4, Sub-Section 4.7.1), and theoretical perspectives on culture (Chapter 4, Sub-Section 4.7.3). Within each category, individual factors were also identified; for instance, internal elements (Chapter 4, Sub-Section 4.7.1) were grouped into leadership and management strategies (Sub-Section 4.7.1.1), security policy (Sub-Section 4.7.1.2), and security technical and best practices (Sub-Section 4.7.1.3). The Researcher considered the explicit categories to be the dominant research themes and the individual factors in each category to be sub-themes. Moreover, code labels were added for the factors within sub-themes; for example, economic factors and external pressure were considered codes within the role of the 2030 vision directive sub-theme. A fourth theme was also added to capture the proposed cyberspace culture framework's validity or robustness in facilitating the achievement of the 2030 higher education vision in Qatar. For this particular theme, the Researcher also moderated a focus group discussion in order to complement the findings from semi-structured interviews (Sub-Section 6.2.1).

The first step subsequently undertaken by the Researcher consisted of developing theme and sub-theme categories in the Nvivo application (Figure 6-11). Thereafter, tools such as word frequency tables were utilised to capture the main ideas identified by participants. A treemap and sunburst were also generated to illustrate the distribution of research themes. A thematic map of the themes and sub-themes considered in the research is presented in Table 7-1 below:

Table 7-1: Thematic map of research findings.

Theme 1: External elements and attainment of the 2030 higher education vision		
Interview question	Main code	Sub-themes
Q1 Q2	Economic factors (Sub-Section 4.7.2.1.1.1)	Sub-theme 1: Role of the Vision 2030 directive
Q3 Q4	External pressure (Sub-Section 4.7.2.1.1.2)	Leadership (Sub-Section 4.7.2.1.1)
Q5	Compliance and advanced security (Sub-Section 4.7.2.1.2.1)	Information security policy and regulation (Sub-Section 4.7.2.1.2)
	Environmental uncertainty (Sub-Section 4.7.2.1.2.2)	
	Political factors (Sub-Section 4.7.2.1.2.3)	
	Learning and teaching (Sub-Section 4.7.2.2.1)	Sub-theme 2: Role of technological advancement (Sub-Section 4.7.2.2)
	Management (Sub-Section 4.7.2.2.2)	
	Implementation framework (Sub-Section 4.7.2.3.1)	Sub-theme 3: Role of the Vision 2030 framework (Sub-Section 4.7.2.3.1)
Theme 2: Internal elements and attainment of the 2030 higher education vision		
Q6 Q7 Q8	Accountability (Sub-Section 4.7.1.1.1)	Sub-theme 1: Leadership and management strategies (Sub-Section 4.7.1.1)
	Risk management (Sub-Section 4.7.1.1.2)	
	Security awareness (Sub-Section 4.7.1.2.1)	Sub-theme 2: Security policy (Sub-Section 4.7.1.2)
	Continuous learning (Sub-Section 4.7.1.2.2)	

	Attitudes and behaviour (Sub-Section 4.7.1.2.3)	
	Security skills and knowledge (Sub-Section 4.7.1.3.1)	Sub-theme 3: Security technical and best practices (Sub-Section 4.7.1.3)
Theme 3: Culture and attainment of the 2030 higher education vision		
Q9	Culture dimensions (Sub-Section 4.7.3.2)	Sub-theme 1: Role of culture (Sub-Section 4.7.3)
	Values Visible processes Attitudes and behaviour (Sub-Section 4.7.3.1)	
Theme 4: Alignment of cyberspace culture framework with the 2030 higher education vision		
Focus group discussion	External elements	Sub-theme 1: Alignment of external elements
	Internal elements	Sub-theme 2: Alignment of internal elements
	Culture	Sub-theme 3: Alignment of culture

Source: The Researcher

7.2.1 Theme 1: External Elements and the Higher Education Vision, 2030 Achievement

The goal of the first theme consisted of investigating how external elements influence the attainment of the 2030 higher education vision in Qatar. By discussing this theme, the Researcher was able to address the fourth research question regarding the cyberspace strategy that the government ought to deploy to align with the country's strategic directions. Likewise, the discussion generated insights that partially address the second research question regarding how the current cyberspace culture frameworks are aligned with the country's strategic directions.

Three main external influences were identified: 1) The Vision 2030 directive, which represents the government's control over higher education in terms of strategies for leadership, regulation, and information security policy; 2) technological advancement and its influence on learning, teaching,

and management; and 3) the Vision 2030 implementation framework, which also alludes to the QNV 2030. An overview of each theme is presented in the following sections.

7.2.1.1 Sub-Theme 1: Role of the Vision 2030 Directive

This sub-theme evaluates the role of the Vision 2030 directive, as defined by the government strategy regarding the achievement of the 2030 higher education vision in Qatar. In Chapter 2, literature confirmed the Qatar government's strategic control over the development of a knowledge-based economy in the QNV 2030, as detailed in Sub-Section 2.4.1 (Qatar National Vision, 2030, 2008). In the proposed cyberspace culture framework, government's strategic directives were found to influence higher education in two ways: leadership on the one hand and information security policy and regulation on the other.

7.2.1.1.1 Leadership

The synthesis of the findings revealed that participants perceive leadership in higher education to be embodied by the government and university management. The government, through the Ministry of Higher Education, was identified as an oversight authority that 1) provides guidelines, regulations, and directions for the higher education institutions; 2) influences the development and implementation of policies adopted by the higher education institutions; and 3) provides funding mechanisms to enhance the sector.

As Respondent 11 explicated,

> 'The government is pushing all the regulatory, policy and strategy, and funding mechanisms … the role of the government is very important'. (Respondent 11)

This highlighting of the government's influential leadership and regulation roles resonates with previously studied cyberspace culture frameworks (Alnatheer and Nelson, 2009; Shabbaan, 2014; Al-Hogail, 2015). Likewise, in Chapter 2, the government's influential leadership role was identified in the Qatar government's funding of the acquisition of scientific research infrastructure (Gasser and Drolshammer, 2015) and the facilitation of mediated technology-based learning (Dunn and Kennedy, 2019), as well as in boosted collaboration between Qatar and its allies (Zhou *et al.*, 2019). Further analysis in Sub-Section 3.2.2.1 also highlighted enhancements for educators

and learners that improve the function of cyberspace as a tool of learning (Crossman, 1997; Harasim, 1993; Jonassen *et al.*, 1999; Khan, 1997; Land and Bayne, 2012; Zoto *et al.*, 2018).

This aspect further emphasises how the government's strategic leadership influences the fostering of cyberspace culture. Figure 7-1 below further demonstrates the overall leadership structure of higher education, as identified by the participants:
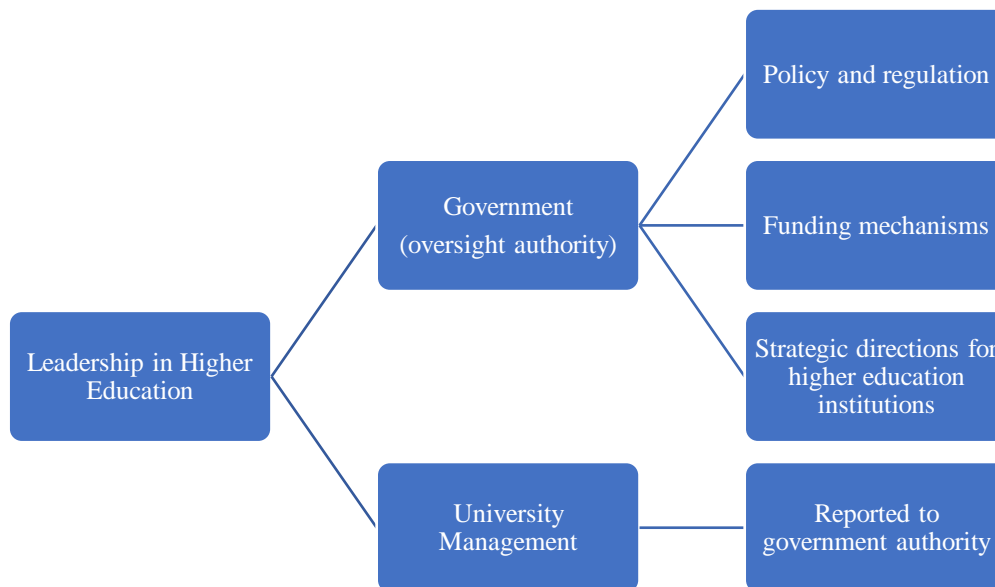
Figure 7-1: Leadership in Qatar higher education.
Source: The Researcher

Figure 7-1 illustrates that the government's strategic directives influence policy, funding, and the strategic directions adopted by higher education institutions. This influence is discussed further in relation to economic factors and external pressure in the following sections.

Category 1: Economic Factors

With this factor, the Researcher was interested in understanding how the government's strategic directives concerning economic issues will influence the implementation of the 2030 higher education vision in Qatar. To this end, four key findings were identified, as summarised in Figure 7-2:

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                                          ┌─────────────────────┐
                                          │   Implementation of │
                                          │     education       │
                                          └─────────────────────┘

                                          ┌─────────────────────┐
                                          │ Increasing capacity of │
                                          │     workforce       │
  ┌─────────────────────┐                 └─────────────────────┘
  │ Government's strategic │
  │  economic directives  │              ┌─────────────────────┐
  └─────────────────────┘                │ Increasing viability of │
                                          │   H.E. institutions  │
                                          └─────────────────────┘

                                          ┌─────────────────────┐
                                          │ Improving sustainability │
                                          │    of H.E. sector    │
                                          └─────────────────────┘
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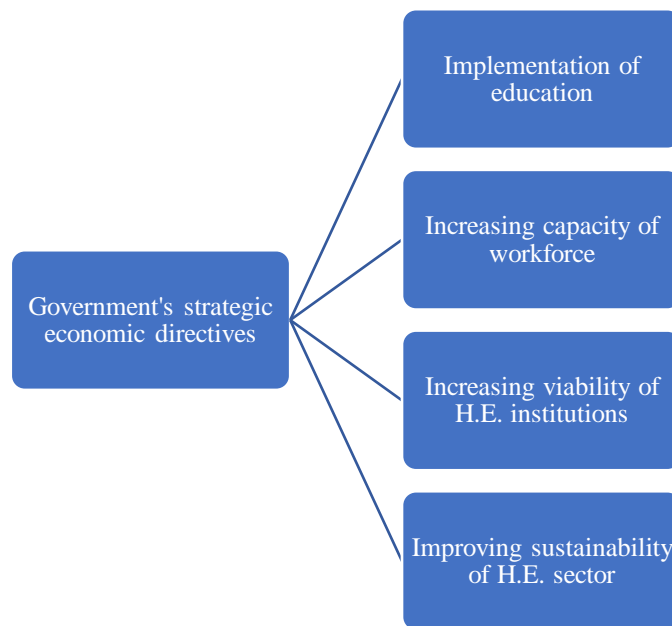
Figure 7-2: Influence of the government's strategic economic directives on the H.E. Vision, 2030.

Source: The Researcher

The first reported influence was that the government's economic directives lead to the setup and development of higher education institutions, as most universities in Qatar are fully funded by the government. Noteworthy examples of such universities include the Qatar University, CCQ, CNAQ, and the University of Calgary (Respondent 1). The participants further revealed that the government's economic directives focus on increasing workforce capacity and the economic viability of higher education institutions. The cited findings—funding of higher education institutions by the Qatar government, enhancement of workforce capacity, and improvement of economic viability—reinforce the human development pillar of the QNV 2030, which seeks to develop the population by investing in scientific research and first-rate education (Qatar National Vision, 2030, 2008). Likewise, the findings reiterate diverse researchers (Fabos and Young, 1999; McLellan, 1998; Reynolds, 2002; Riel, 1995), who have also confirmed that technologies and learning infrastructure in cyberspace boost learning and collaboration outside the classroom. Such technologies are argued to be acquired through government financial assistance, as the government plays an integral role as a stakeholder in cyberspace (Baker, 2016; Barzilai, 2004). As the Qatar government focusses on building a knowledge-based economy, investment in higher education is considered paramount. The third finding in particular underscores this fact, since participants cited

that investment is meant to increase in the economic viability of higher education, such as by creating additional institutions.

Fourth, the findings also revealed that participants link government funding to the enhancement of sustainability in higher education, as they are empowered to acquire necessary resources, technologies, and infrastructure. Such findings align with Marshall (2018), who argued that, since higher education institutions are challenged by high operation costs, government support from the Vision 2030 directives helps to develop independent institutions to train the Qatar population. The literature in Sub-Section 3.2.4 further confirms that cyberspace represents a tool for learning and content creation, and thus necessitates acquiring appropriate tools and technological infrastructure (Lessig, 2002; Bell, 2009). Cantwell, Coate, and King (2018) also stated that the government comprises a major stakeholder in higher education, and thus provides the required funding. Therefore, the Qatar government's economic strategic directives can be understood to influence the achievement of the 2030 higher education vision by providing funding to set up higher education institutions, procure necessary infrastructure and technologies, enhance workforce capacities, and ensure sector sustainability on a long-term basis.

Category 2: External Pressure

With the second category, the Researcher focussed on understanding how government strategies, in exerting external pressure on higher education institutions, influence the attainment of the 2030 higher education vision. Two important findings were accordingly identified, as detailed in Figure 7-3 below:
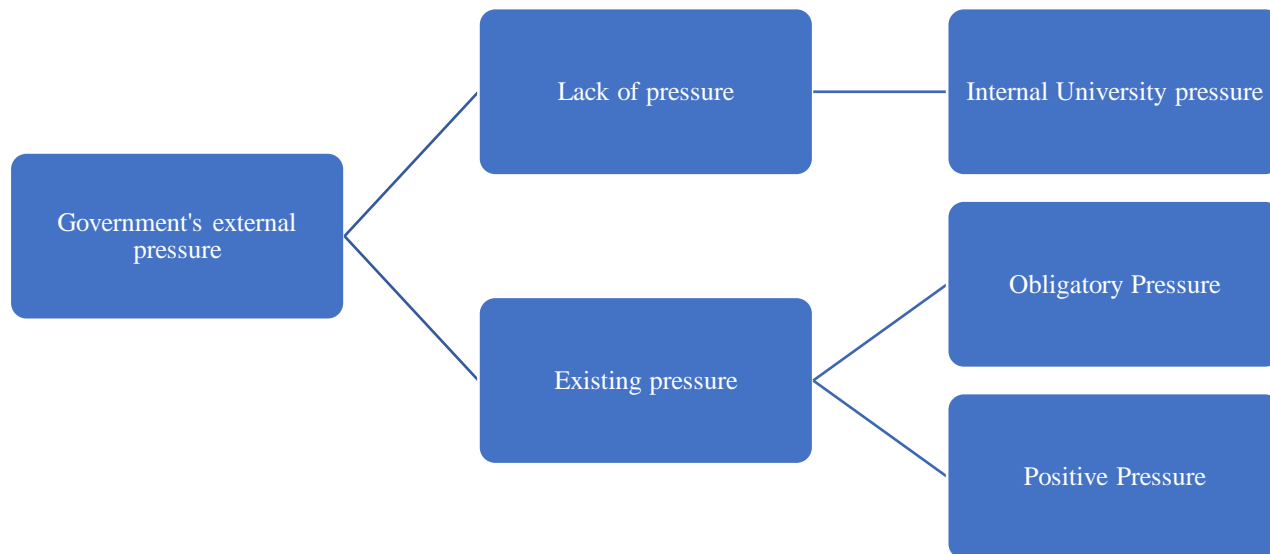
Figure 7-3: Influence of the government's external pressure directives on the H.E. Vision, 2030. Source: The Researcher

According to the findings, some participants reported pressure from the government, exerted through the Ministry of Higher Education (Respondents 6 and 9). This pressure was further sub-divided into two categories: First, the obligatory pressure was attributed to the Ministry's constant actions in evaluating whether set directives have been achieved by institutions. A plausible explanation for the obligatory pressure is that the government funds the institutions, thus requiring them to be accountable for their operations (Cantwell, Coate and King, 2018). Furthermore, in Section 2.6, the government was also identified as a policy-making body that influences overall decision-making and the usage of cyberspace (Barzilai, 2004; Baker, 2016). Other researchers in Chapter 4 (Alnatheer and Nelson, 2009; Shabbaan, 2014; Al-Hogail, 2015) have also reported that the government is integral to formulating and implementing policies and regulations for the higher education sector. As a result, external pressure is also expected to ensure that the set guidelines and regulations are adhered to.

Second, positive pressure was attributed to pushing institutions to achieve their goals. Such pressure was argued to arise from the positive rapport between higher education institutions and the Ministry of Higher Education.

As Respondent 18 asserted,

'Yeah, I mean, if we consider strategic goals that are set by the country as pressure, I will say it is positive pressure'. (Respondent 18)

In this context, it can be argued that the Ministry focusses on advancing higher education in the country, thus pushing the institutions to achieve more strategic objectives. One such case involves advancing scientific research to attain world-class levels, as stipulated by the QNV 2030 (Qatar National Vision, 2030, 2008). Furthermore, as revealed by the findings in Sub-Section 3.2.2 detailing the use of cyberspace as a tool of learning, numerous advantages are associated with the adoption of advanced cyberspace technologies, which lead to positive pressure. These advantages include solving problems (Duffy and Jonassen, 1992; Jonassen, 1993), boosting participation and engagement (Szücs *et al.*, 2013; Cope and Kalantzis, 2017), and improving collaboration (Fabos and Young, 1999; McLellan, 1998; Reynolds, 2002; Riel, 1995).

A second school of thought identified by some participants concerns the lack of external pressure from the government. The participants argued that the only pressure present within higher education institutions arises from senior management. However, critical analysis of the finding further suggests that the pressure is indirectly exerted by the government. Nonetheless, the key finding concerns the fact that the government's external pressure influences the attainment of the 2030 higher education vision by pushing institutions to achieve set objectives and ensuring that they comply with established regulations and guidelines.

7.2.1.1.2 Information Security Policy and Regulation

Within the same sub-theme regarding the government's Vision 2030 strategic directives, the Researcher further investigated how directives concerning information security policy and regulation influence the attainment of the 2030 higher education vision. The analysis of responses revealed that participants perceive the progress in developing information security policies in two different ways. Figure 7-4 details the participants' views on Qatar's information security policy:
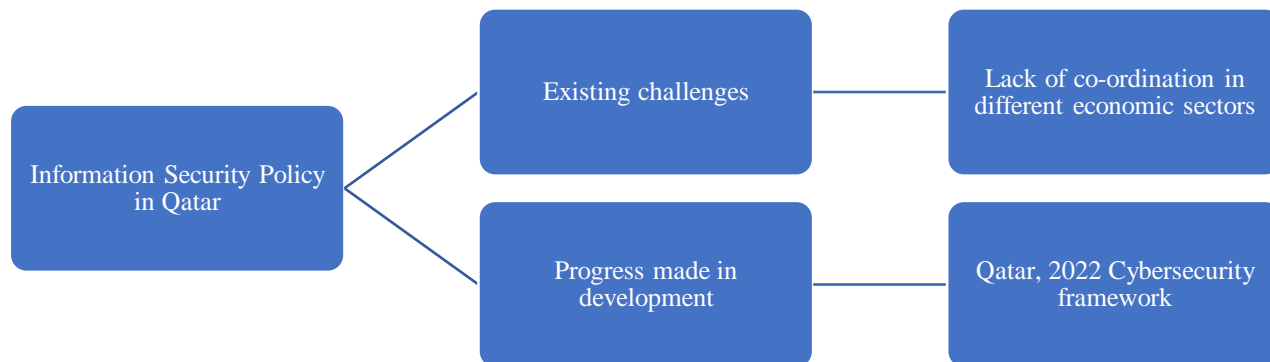
Figure 7-4 : Participants' understanding of information security policy in Qatar.

Source: The Researcher

One important finding is that information security policy is important not only in higher education, but also in other economic sectors. However, participants also mentioned current challenges concerning the lack of standardised policies across different sectors. This finding highlights a lack of coordination among different sectors despite the fact that the QNV 2030 seeks to promote growth for the entire economy (Qatar National Vision, 2030, 2008). The identification of extant challenges in developing information security policies alludes to the infancy of security culture in the country. This finding further resonates with Alnatheer and Nelson (2009), who cited that, in Saudi Arabian workplaces, information security culture remains in its infancy despite high economic development. Likewise, in Section 2.7 concerning the openness of cyberspace culture, researchers such as Fabre *et al.* (2016) have argued that resistance has been mounted against the development of standard laws to govern cyberspace, leading to the observed gap. This was further stressed in Section 2.8, where the lack of cyberspace culture frameworks to guide the attainment of strategic objectives was identified (Brunn, 2014).

A second noteworthy finding is that, although a lack of co-ordination represents a problem in Qatar, with the Qatar 2022 Cybersecurity Framework, the government has still made important strides in implementing information security policies in sectors such as football in order to help prepare for the 2022 FIFA World Cup. This finding also aligns with previous work by Foody *et*

al. (2017), which demonstrated that cybercrime laws were enacted in Qatar in 2014 to ensure protection against cybercrime and secure intellectual property. Fabre *et al.* (2016) further reported that solutions such as adopting cyberspace rules parallel to international public law and international environmental laws have been considered. Furthermore, the Qatar government has also widely adopted e-government solutions to deliver services to its citizens (Al-Hakim, 2007; Kettani and Moulin, 2015).

Following this, the Researcher evaluated how the government's strategic directives influence information security policy and regulation in terms of three core factors described in the next section.

Category 1: Compliance and Advanced Security

The first category sought to identify how the government's strategic directives regarding information security policy and regulation influence compliance and advanced security, as well as how this influences the attainment of the 2030 higher education vision (Sub-Section 4.7.2.1.2.1). Three important findings were accordingly identified, as summarised in Figure 7-5 below:
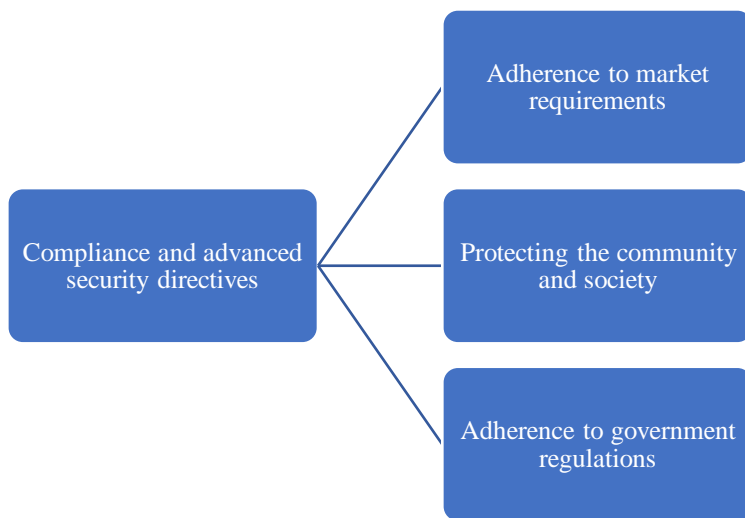
Figure 7-5 : Influence of compliance and advanced security on the H.E. Vision, 2030 attainment.
Source: The Researcher

First, participants identified that compliance and advanced security directives serve the role of enabling higher education institutions to meet international market standards. In turn, this leads to

the second role of ensuring protection for the society and the community as Qatar interacts with foreign countries. These findings directly align with the QNV's human development pillar, which advocates for prioritising world-class scientific research and first-rate education (Qatar National Vision, 2030, 2008). Compliance with international best practices would ensure that Qatar achieves its vision of modernising its education sector. In the same vein, such compliance would improve international co-operation between Qatar and its allies, leading to better coexistence (Qatar National Vision, 2030, 2008). Previous findings by Cantwell, Coate, and King (2018) also revealed that the government facilitates partnerships with foreign investors in higher education, ensuring compliance with international market standards to enhance such relations. Furthermore, as the findings in Sub-Section 3.2.1.2 demonstrate, cyberspace as a unique cultural space adheres to the universality-without-totality concept, thereby extending to international boundaries (Le'vy, 2001). Subsequently, a need further arises to protect actors in cyberspace from negative activities such as cybercrime, espionage, and cyberterrorism (Galinec *et al.*, 2017).

The third role of the compliance and advanced security directives involves ensuring that institutions adhere to established government regulations. Participants cited the use of cloud computing as an example of a government directive that must be adhered to. The main argument advanced in support of compliance with regulations is that the government plays an oversight role in higher education by providing funding and developing policies. As a result, institutions must demonstrate accountability through compliance. This finding resonates with Mumper *et al.* (2011), who reported that institutions must comply with security policies and that failure results in violation of the law. Additionally, evaluating compliance with advanced security through the lens of cyberspace culture further reveals its importance in ensuring that Qatar's higher education institutions meet the demands of international law—a finding that aligns with Weber (2012). The argument is that, as cyberspace is not limited to a particular geographical area and exerts international influence, it is necessary to ensure that information security in higher education institutions meets international best practices in order to protect the society and community (Barzilai, 2003). This finding also resonates with the literature in Section 2.3, where security challenges in cyberspace, such as cyberterrorism, cybercrime, cyberwar, and espionage, were discussed (Galinec *et al.*, 2017). The key argument is that compliance with international regulations would ensure that actors remain protected from adverse criminal activities.

Category 2: Environmental Uncertainty and Political Factors

The second category considered how the government's strategic directives regarding information security policy and regulation influence environmental uncertainty and political factors, as well as how this influences the attainment of the 2030 higher education vision (Sub-Section 4.7.2.1.2.2 and (Sub-Section 4.7.2.1.2.3). The findings are summarised in Figure 7-6 below:

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┌──────────────┐     ┌──────────┐          ┌─────────────────────┐     ┌─────────────────────┐
│Environmental │     │          │          │Politically motivated│─────│ Change in leadership│
│uncertainty and│────│Disruption│──────────│                     │     │                     │
│political factors│   │          │          └─────────────────────┘     └─────────────────────┘
└──────────────┘     └──────────┘          ┌─────────────────────┐     ┌─────────────────────┐
                                            │Not politically related│───│  Covid-19 pandemic  │
                                            └─────────────────────┘     └─────────────────────┘
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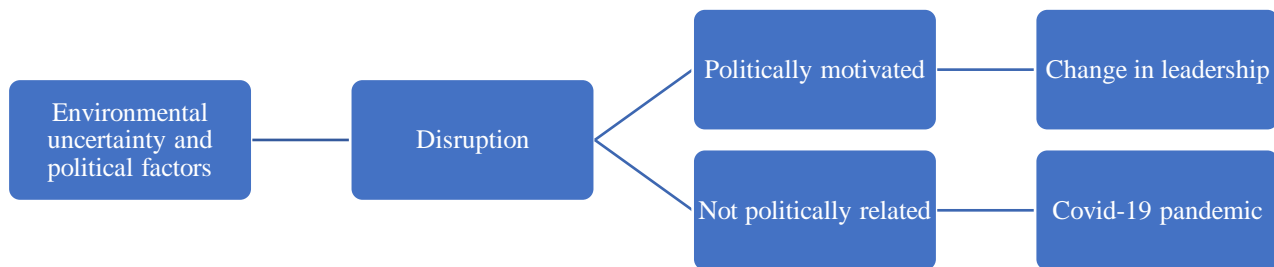
Figure 7-6: Influence of environmental uncertainty and political factors on the H.E. Vision, 2030.

Source: The Researcher

The main finding reported from the synthesis of responses is that environmental uncertainty disrupts operations in higher education, thus hindering the attainment of the 2030 higher education vision. This disruption is further attributed to two main sources: political influences and non-political issues. To begin with, participants identified political influences such as changes in leadership within higher education institutions as a leading cause of environmental uncertainty and disruption of operations, as the change in senior leadership was argued to influence the attainment of the vision and strategic objectives. This view aligns with Skakni *et al.* (2019), who also claimed that changes in higher education leadership, such as in the Ministry, would lead to uncertainty, as doubt would arise concerning how the institutions would be managed. A similar finding was also reported by Adamu (2019), who posited that the Ministry of Education (political factors) previously played a role in nominating and appointing university leaders. Pinheiro *et al.* (2019) further reported that, in Sweden, the Ministry of Education appointed 4 out of 11 members of the university governing council. Such findings emphasise leadership change's negative influence on

the attainment of the long-term 2030 vision for higher education. However, several participants did not agree that changes in leadership would disrupt university operations.

Furthermore, the participants reported that disruption of operations would arise from external political influences, such as the blockade, which was argued to affect the country's higher education dynamics. For instance, it was suggested that the blockade would cause the Qatar Foundation University to close its branches (Respondent 1). Such external influences have previously been identified in the work of Mok (2016), who suggested that transitions in political power would generate environmental uncertainty as higher education institutions become unsure of receiving continued support in the new government. In this context, the change in power occurs in the central government rather than the Ministry of Higher Education or senior management within universities. The findings from the literature in Section 2.6 concerning rule-making in cyberspace likewise suggest that stakeholders involved in developing policies and rules in the digital space would influence the actors' actions and the usage of cyberspace, which is subsequently likely to lead to uncertainty (Baker, 2016).

In the context of cyberspace culture, researchers such as Barzilai (2004) have also previously reported that politics influences decision-making processes and overall governance. Therefore, the impact of external political events was identified as a causative factor of environmental uncertainty. Moreover, Bell (2001) reported that cyberspace is centred on people, their cognition of self, and the experiences they create in the space—a finding suggesting that any actions that affect their experiences will lead to environmental uncertainty. Finally, participants revealed that uncertainty could also arise from non-politically related factors, such as the current Covid-19 pandemic. Such external disturbances were argued to adversely influence strategy implementation.

7.2.1.2 Sub-Theme 2: Role of Technological Advancement

The second sub-theme investigated how technological advancement, as an external element, influences the attainment of the 2030 higher education vision.

7.2.1.2.1 Technological Advancement

The Researcher was keen to understand how the use of advanced technologies to facilitate learning and teaching, as well as the management of institutions, influences the achievement of the vision. These factors are discussed in the following section.

Category 1: Learning and Teaching

Regarding the use of technology to facilitate learning and teaching, Figure 7-7 summarises the primary findings that were obtained:
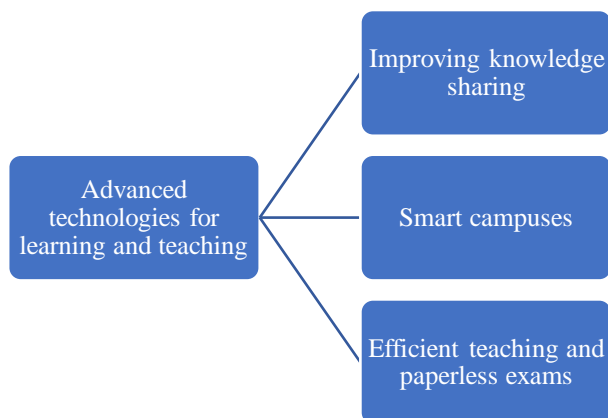
Figure 7-7: Influence of advanced learning and teaching tech on the H.E. Vision, 2030 attainment.

Source: The Researcher

Synthesis of the results revealed three important findings: First, technology comprises an enabler of collaboration and knowledge sharing, both explicitly in terms of documents and articles and implicitly in terms of ideas between learners. As such, technology was identified to improve interactions within learning environments. These findings align with the literature in Chapter 2, Sub-Section 2.5.2 as well as Chapter 3, Sub-Section 3.2.2.1. For instance, in the previous works of Talebian *et al*. (2014), ICT technologies were found to boost learning by eradicating the limits of time and place. Similarly, Dunn and Kennedy (2019) reported that technology-based learning enhances existing educational models by shifting from teacher-centred to learner-centred approaches that are more self-paced and self-directed. Esteves, Matias, and Pereira (2018) added that technology-mediated collaborative learning enables learners to enhance soft skills such as oral communication and social interaction. In addition, Mahlangu (2018) observed that technology-enabled learning is self-paced, and students can complete it in a flexible manner.

A second finding is that learning and teaching technologies facilitate the development of smart campuses where students can easily manoeuvre within their schools using artificial intelligence

apps and without relying on any external assistance. This finding resonates with Ho *et al.* (2010), who revealed that modern learning approaches introduce the use of technological material and, in turn, lead to reduced reliance on traditional materials, such as hardcopy books. In this case, physical maps would represent the hardcopy version of the modern applications employed. Sari, Ciptadi, and Hardyanto (2017) further highlighted the role of smart campus technologies in innovating learning, as RFID technologies provide real-time connectivity to outside entities. Continuing, Chan and Chan (2018) reported that technologies such as IoT transform libraries into smart-learning spaces that improve peer collaboration and social learning.

A third finding is that technology enhances current teaching practices, such as by introducing paperless exams and having them marked within a short time period. This finding aligns with Oliveira *et al.* (2019), who previously reported that technology improves pedagogical processes through simulations, virtual labs, and robots, among other things. Allsop *et al.* (2020) also cited the use of video-conferencing technologies to deliver anatomical teaching to medical students. In the wider relation to cyberspace, diverse educational technologists (Crossman, 1997; Harasim, 1993; Jonassen *et al.*, 1999; Khan, 1997; Land and Bayne, 2012; Zoto *et al.*, 2018) have also argued that cyberspace could be considered a teaching site that maximises the available learning that could be achieved.

Nevertheless, despite the various cited advantages, the participants also reported that challenges such as resistance to technologies and the lack of an adoption strategy hinder the use of technology in learning and teaching.

As Respondent 12 stated,

> 'I have seen talks about it, but I have not seen anything in strategy. Now, back to the strategy itself … about method of teaching improving things'. (Respondent 12)

Such findings further emphasise the need for Qatar higher education institutions to develop strategies to improve overall acceptance of the proposed technologies.

Evaluation of the findings in this section suggests that, in order to achieve QNV 2030, Qatar will increase its dependence on advanced technologies to facilitate attaining its objectives regarding the delivery of teaching and learning. These findings accordingly revealed that technology would enable knowledge-sharing and collaboration (Talebian *et al.*, 2014), facilitate the development of smart campuses (Ho *et al.*, 2010), and improve teaching practices (Oliveira *et al.* (2019). Despite this, however, there is also need to consider the likelihood of a retrograde shift in technology—an aspect that is implied by the current trend, whereby more post-digital experiences are being advocated, such as digital detoxing and abstinence from smartphones (Wilcockson, Osborne and Ellis, 2019). The argument for this retrograde shift in technology use concerns the fact that recent decades have witnessed widespread use and dependence on technology. As a result, this has subsequently led to technology misuse and unprecedented consequences such as addiction to smartphones and video games. The implied solution thus involves adopting retrograde activities such as reduced usage of smartphones as well as undertaking digital detox processes.

Second, as Hussein *et al.* (2020) postulate, students in the UAE were observed to develop negative attitudes regarding emergency online learning due to the Covid-19 pandemic. Noteworthy issues associated with e-learning included heavy workload, constant distractions, and problems with technology.

These two findings regarding the popularity of digital detox and negative attitudes towards emergency e-learning suggest a likely retrograde shift against e-education and the subsequent resurgence of traditional 'chalk-and-board' teaching approaches in the future. Therefore, there is also a need for the QNV 2030 to consider this aspect critically, including the various effects it is likely to exert on the attainment of the 2030 higher education vision.

Category 2: Management

Regarding the use of technology for managing higher education institutions, three important findings were reported, as presented in Figure 7-8 below:
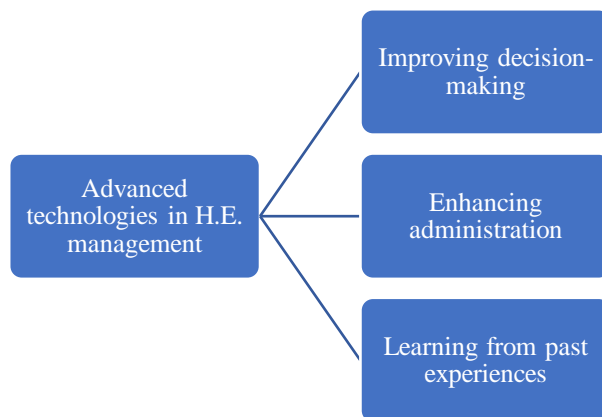
Figure 7-8: Influence of management technologies on the H.E. Vision, 2030 attainment.

Source: The Researcher

First, four participants (22.2%) revealed that technology facilitates tough decision-making and improves resource management, especially in the wake of declined oil prices and the Covid-19 pandemic. In this regard, technology is employed to streamline processes and facilitate difficult decisions due to the budgetary reductions experienced. A second, similar finding concerns the use of machine learning and analytics to facilitate learning from past experiences.

As Respondent 18 explicated,

> 'We are learning from the previous experience how we were doing that using analytics, using machine learning in order to learn about the behaviours'. (Respondent 18)

The two findings regarding technology-enabled decision-making and the use of analytics and machine learning to learn from previous experiences align with previous research detailed in Chapter 2, Sub-Section 2.5.2.2; for instance, Kurilovas (2018) demonstrated that artificial intelligence and data-mining techniques are becoming pivotal in higher education institutions, as they generate important insights from the large, existing datasets. Likewise, Liebowitz (2016) reported that analytics and big data are important for improving decision-making processes in different aspects of higher education. Daniel (2014) likewise highlighted the use of data analytics as a tool to formulate better policies that are data-driven.

As presented in Chapter 6, Sub-Section 6.3.1.3.2, participants revealed that technologies are also improving administration processes by making them 'smoother and secure' and by addressing current management bottlenecks. Such findings reiterate Singh's (2018) claim that information systems aid management by improving the creation, storage, and dissemination of different information types. Daniel (2014) also reported that administrators are able to make better data-driven decisions across different institutional departments by using technology. Furthermore, other researchers, such as Akçapınar, Altun, and Aşkar (2019), have reported that learning analytics systems allow university management to develop effective policies to ensure that students do not drop out of their classes by collecting insights concerning the risk factors that would lead to such an event. Natow *et al.* (2017) also cited the use of student support technologies to track performance and lower student attrition rates. Jones (2019), meanwhile, highlighted that digital technologies would allow one to track student behaviour and facilitate the analysis of their profiles to promote learning.

7.2.1.3 Sub-Theme 3: Role of Vision 2030

The final sub-theme of the external elements concerned the Vision 2030 implementation framework. Here, the Researcher sought to identify how the framework influences the attainment of the 2030 higher education vision.

7.2.1.3.1 Vision 2030 Implementation Framework

From the synthesis of the obtained responses, the key finding is detailed in Figure 7-9 below:
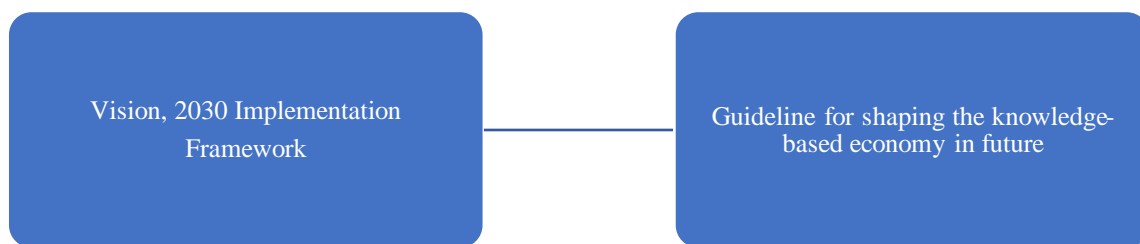
Figure 7-9: Influence of Vision 2030 implementation framework on the H.E. Vision, 2030 attainment.

Source: The Researcher

As detailed in Figure 7-9, the participants viewed the Vision 2030 implementation framework as a guide that helps shape the development of a knowledge-based economy by facilitating the uptake

of modern technologies. The participants further argued that, for many generations, Qatar's economy has relied on hydrocarbons in oil exports. However, with the uptake of technology, the economy will instead leverage its population's innovative capacities via their ingenuity and capabilities.

As Respondent 1 explicated,

'Technology that can discover what else is beneath the sand in Qatar … tapping into the ingenuity and the capabilities that are in people'. (Respondent 1)

These findings directly align with the QNV 2030, which seeks to modernise the Qatar economy into one that is knowledge-based by enhancing human, social, environmental, and economic development (Qatar National Vision, 2030, 2008). In the context of higher education, the implementation framework provides a guideline for enhancing education to reach world-class standards in order to ultimately increase the Qatar population's capabilities and unlock their potential (Qatar National Vision, 2030, 2008). In the literature, the findings largely align with works reported in Chapter 2, Sub-Section 2.4.1, where the role of each pillar of the QNV 2030 was discussed.

Despite this view, other participants criticised the Vision 2030 implementation framework for its lack of performance indicators or definite milestones to signal what has been achieved over time. For instance, the use of KPIs was recommended over a four-year period to assess what has been achieved within that period. The argument is that following a long-term plan without any definite milestones would be highly challenging.

7.2.2 Theme 2: Internal Elements and the H.E. Vision, 2030 Achievement

Following the analysis of how external elements influence attaining the 2030 higher education vision, the second theme further investigated how internal elements influence the attainment of said vision. Three core sub-themes were accordingly analysed, as detailed in the coming sections.

7.2.2.1 Sub-Theme 1: Leadership and Management Strategies

With the first sub-theme, the concern was to identify how leadership and management strategies formulated within higher education institutions influence the attainment of the 2030 higher

education vision. To this end, the Researcher was particularly interested in understanding how the developed strategies promote accountability and risk management.

7.2.2.1.1 Accountability and Risk Management

From the synthesis of the responses, the key findings are summarised in Figure 7-10 below:

Figure 7-10: Influence of leadership and management strategies on the H.E. Vision, 2030.

Source: The Researcher

Regarding the strategies' influence on accountability, participants agreed that leaders possess a responsibility to develop clear implementation plans that facilitate attaining strategic goals and responsibilities. Additionally, they cited that reliance on mature implementation frameworks would further improve such plans, as they outline necessary KPIs to evaluate progress. In turn, this would ensure successful achievement of strategic goals in higher education institutions. Such findings align with Ghanem and Castelli (2019), who previously reported that accountable leadership ensures the protection and development of ethical organisational perspectives.

A similar perspective can also be drawn from the development of the QNV 2030 by Qatar leadership to guide the implementation of strategic objectives related to the four human, social, economic, and environmental pillars (Qatar National Vision, 2030, 2008). Qatar leadership can be

argued to be accountable for achieving the overall 2030 vision through development of the vision plan, which serves as an implementation framework. Likewise, the development of the Qatar 2022 Cybersecurity Framework cited in an earlier section further underscores Qatar leadership's accountability in preparation for the FIFA World Cup. Regarding the implementation of technology-based learning, other researchers have also cited that implementation frameworks had been developed to guide the various processes in higher education, such as blended learning education (Garrison and Vaughan, 2013), blogging (Kerawalla *et al.*, 2009), and re-engineering of educational technology education (Kelley and Kellam, 2009).

A second finding is that leadership strategies would also facilitate accountability by ensuring that top leadership guides and supports the workers' actions. This suggests that it is not sufficient for leaders to simply craft implementation plans; rather, they must also support their employees and provide guidance in implementing those plans. Continuing, previous work by Leonard *et al.* (2016) further revealed that leadership's personal qualities, administrative behaviours, and actions influence culture formation and maintenance in organisations. In this context, it is argued that leadership accountability behaviour helps guide workers to implement strategic objectives and goals. Schein (2013) also cited that leadership represents the source of values and beliefs in organisations, and as such, leaders play an important role in dictating the values that their employees adhere to. The guiding role of Qatar as a leader in developing a knowledge-based economy was further emphasised in Chapter 2, Section 2.4, where the QNV 2030 was observed to account for development in all sectors—namely, human, social, economic, and environmental (Qatar National Vision, 2030, 2008). The participants, however, argued for the need to offer more training for leaders in higher education in order to improve their competency.

With risk management, participants revealed that appropriate leadership and management strategies help reduce risks by promoting efficiency through ensuring that activities are performed properly. These findings resonate with Hartman, Townsend, and Jackson (2019), who, for instance, reported high risks associated with adopting modern technology in higher education. One approach to eliminating these risks involves adopting existing frameworks, such as blended learning education (Garrison and Vaughan, 2013), blogging (Kerawalla *et al.*, 2009), and re-

engineering of educational technology education (Kelley and Kellam, 2009). Such frameworks provide a basis for understanding integration processes not specific to situations in Qatar.

However, the participants also cited that, in Qatar higher education, leadership and management are too centralised, making decentralisation necessary to promote collaboration among different departments.

7.2.2.2 Sub-Theme 2: Security Policy

The second sub-theme sought to identify how security policies influence the attainment of the 2030 higher education vision. To this end, participants were asked how security policy affects security awareness, continuous learning, and their attitudes and behaviour, as well as how this subsequently influences the achievement of the 2030 higher education vision. The findings are discussed in the following sections.

7.2.2.2.1 Security Awareness and Continuous Learning

Based on a review of the generated responses, the Researcher combined the views on continuous learning and security awareness due to the thematic similarity observed. The key findings are summarised in Figure 7-11 below:
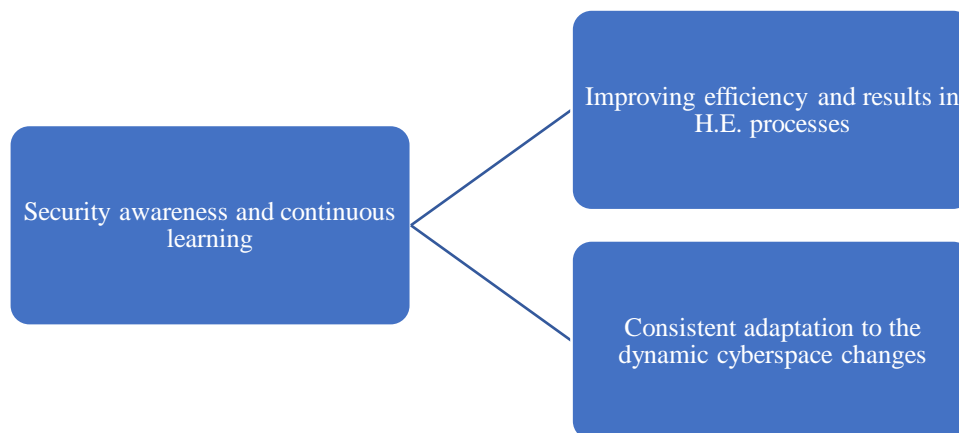
Figure 7-11: Security awareness and continuous learning influencing the H.E. Vision, 2030 attainment.

Source: The Researcher

As detailed in Figure 7-11, two main findings were obtained: The first emphasises the importance of security awareness and continuous learning for improving the efficiency of processes and,

eventually, the results that were obtained. The suggestion is that, as security policies are constantly updated, this ensures process efficiency and leads to improved results in an iterative manner. This assertion is based on Robbins (1998), who reported that security policy guides organisations to develop strategies to help complete assigned tasks. This finding further aligns with Kanwar, Balasubramanian, and Carr (2019), who previously described continuous learning as a process of constant reskilling and upskilling to meet industry demands. In this context, updates to security policy would allow higher education institutions to constantly improve their awareness and skill levels, subsequently enhancing their efficiency in achieving the broader 2030 higher education vision.

The second finding is that security awareness and continuous learning would enable higher education institutions to keep abreast of the dynamic changes occurring in the cybersecurity world. Participants argued that dynamic rather than fixed security policies are required to ensure that institutions constantly adapt to changes in their environments. This finding directly aligns with Kanwar, Balasubramanian, and Carr's (2019) emphasis on the need for continuous learning, reskilling, and upskilling to meet industry demands. Additionally, the findings echo previous researchers (Landow, 1992; Apple and Jungck, 1996; Raschke, 2003; Aarseth, 1997) who have argued that identities in cyberspace are dynamic rather than static, as technologies continually morph. Therefore, continuous learning and improved self-awareness would allow higher education institutions to align with changing market demands as they focus on attaining the 2030 higher education vision.

7.2.2.2.2 Attitudes and Behaviour

In addition to positively influencing security awareness and continuous learning, security policies were also argued to influence the attitudes and behaviour of employees in higher education institutions. The main findings are detailed in Figure 7-12:
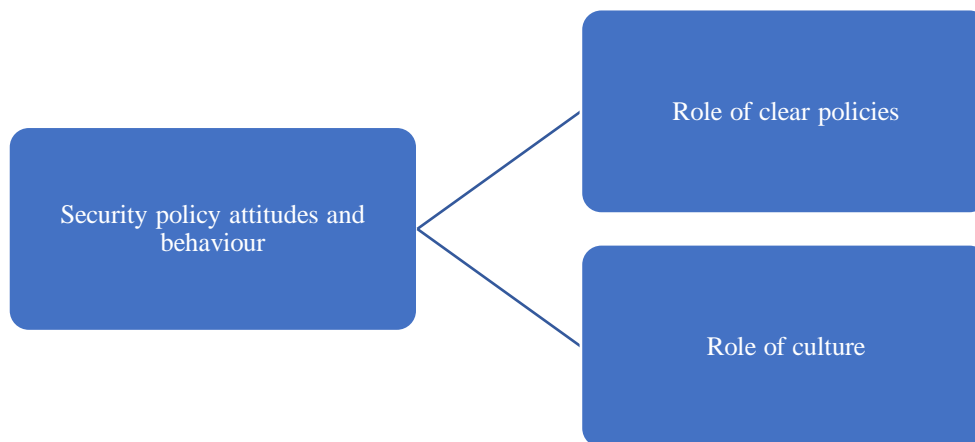
Figure 7-12: Perspectives on attitudes and behaviour influencing the H.E. Vision, 2030 attainment.

Source: The Researcher

By evaluating the responses, two main findings were identified: The first concerns the role of clear and easy-to-understand security policies that would guide employee actions. The suggestion is that implementing clear policies would positively influence behaviour and attitude change. Similar findings have also been reported by various researchers (Robbins, 1998; Da Veiga, 2008) arguing that information security behaviour within organisations must be aligned in order to promote positive security cultures.

The second finding is that the type of culture fostered within an organisation also influences employee attitudes towards adopting various guidelines and regulations stipulated in the security policies. As such, emphasis was placed on avoiding generic security policies that lack contextual meaning for employees. The findings regarding culture's role in influencing attitude and behaviour change resonated with Schein (1984, 2013), who claimed that culture within an organisation is formed over time and subsequently influences how individuals think, feel, and perceive in regard to solving problems. Furthermore, in Section 4.4, the Researcher posited a link between organisational culture and behaviour, with cyberspace culture influencing employees' behaviour in terms of how they interact with information assets and security. Likewise, the evaluation of different information security frameworks (Alnatheer and Nelson, 2009; Shabbaan, 2014; Da Veiga and Elof, 2010) indicates that culture within organisations fundamentally influences the security behaviours adopted by employees.

7.2.2.3 Sub-Theme 3: Security Technical Best Practices

In the third sub-theme, the Researcher sought to understand how security technical best practices adopted in higher education institutions influence the attainment of the 2030 higher education vision. Findings on best practices were accordingly discussed in regard to the enhancement of security skills and knowledge, as detailed in the following section.

7.2.2.3.1 Security Skills and Knowledge

From the synthesis of the responses, the main findings are summarised as illustrated in Figure 7-13:
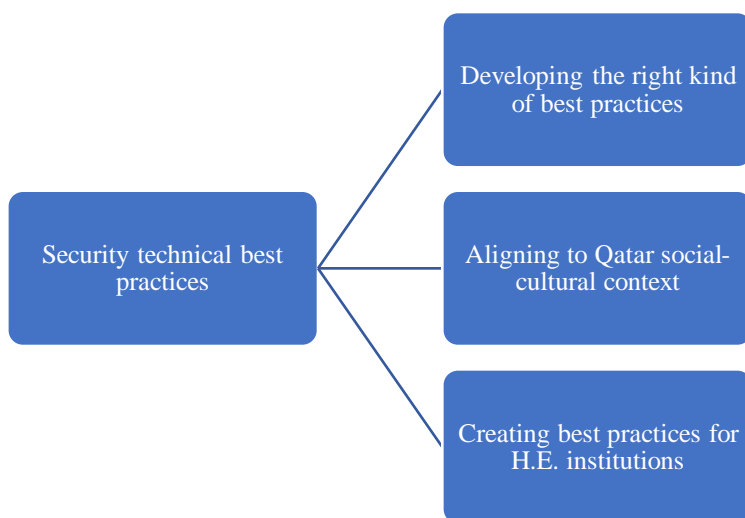
Figure 7-13: Perspectives on security technical best practices influencing the H.E. Vision, 2030 attainment.

Source: The Researcher

All participants agreed that best practices are generally highly important for attaining the 2030 higher education vision. However, they argued that, as a prerequisite to implementing best practices in higher education institutions, it must be ensured that the proper types of practices are developed in the first place. Guidelines and procedures for implementing best practices were subsequently underscored to ensure that the proper practices were identified. The findings align with Gregg *et al.* (2017), who previously reported that most higher education institutions rely on major established tech vendors to facilitate implementing e-learning platforms due to their innovativeness and security. Likewise, Shabbaan (2014) advocated for adopting ISO/IEC 27002

to inform best practices in information security management. Furthermore, in Section 3.3, the Researcher argued that having best practices is important to guide novice learners in boosting their learning experiences in the digital space.

A second important finding is that, in addition to identifying the proper security technical best practices, it was further necessary to align them with Qatar's social-cultural context. The participants cited that, in order for the best practices to work effectively in higher education institutions, they needed to be modified further to fit Qatar's specific conditions.

As Respondent 2 asserted,

> 'If any system fails here, it is not because it's bad, but because it does not fit and align to our social norms'. (Respondent 2)

This finding led to a discussion regarding the various ways in which best practices could be formulated or created to meet the needs of Qatar higher education institutions. As a result, two important ideas were advanced: benchmarking from other existing frameworks and creating one's own best practices aligned with budgets, initial goals, and operational goals. The first idea on developing best practices by benchmarking from existing frameworks aligns with Shabbaan (2014), who highlighted the use of the ISO/IEC 27002 framework to derive best practices for information security management in organisations. Similarly, in tackling the problem of implementing digital learning in cyberspace, diverse frameworks were found to facilitate the processes, such as blended learning education (Garrison and Vaughan, 2013), blogging (Kerawalla *et al.*, 2009), and re-engineering of educational technology education (Kelley and Kellam, 2009). Some participants supported this idea, stating that one should avoid developing practices from scratch; instead, existing practices ought to be reviewed and modified to fit the Qatar context.

With the second idea on creating best practices within higher education institutions, the participants further suggested a need to establish research institutions to facilitate the process and aid in developing the proper types of practices. Such institutions were argued to help search for existing best practices and find ways to customise them to meet the needs of the individual higher

education institutions. This idea resonates with Lessig (2002), who previously argued that dominant vendors of e-learning systems in cyberspace act as gatekeepers that restrict creative freedom. Therefore, the creation of one's own best practices could be considered a strategy to express creative freedom in devising unique practices. Further findings in Section 3.3 likewise underscore the need for Qatar to craft its own unique frameworks to guide learners and educators in cyberspace.

7.2.3 Theme 3: Culture and the H.E. Vision, 2030 Achievement

With the third theme, the Researcher focussed on identifying the role that culture plays in attaining the 2030 higher education vision. In the proposed cyberspace culture framework (Figure 4-7), culture is represented as two theoretical perspectives: levels of culture (Schein, 1984, 1992) and dimensions of culture (Hofstede, 1984, 2010). However, when discussing culture's influence in higher education, participants considered its influence in general as opposed to from the two strict perspectives. The following section discusses the findings that were accordingly obtained.

7.2.3.1 Sub-Theme 1: Role of Culture

Based on the synthesis of the findings, three important insights were obtained, as detailed in Figure 7-14 below:
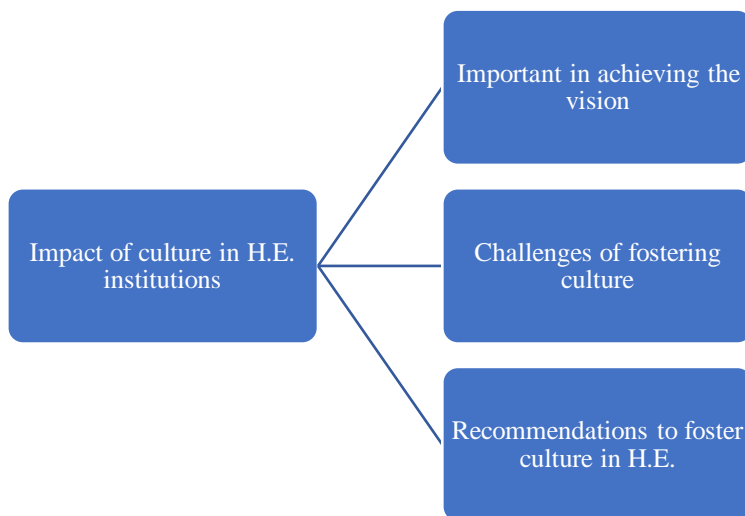
Figure 7-14: Perspectives on the influence of culture on the H.E. Vision, 2030 attainment.

Source: The Researcher

As presented in Chapter 6, Sub-Section 6.3.3.1, participants noted that culture is highly important for achieving the higher education vision, as individuals in an organisational setting must be aligned with any change being introduced in order to implement it successfully. Additionally, participants reported that culture outside the organisation—that is, within the community and society—also influences the culture that is developed. Society's broader influence on cyberspace culture was similarly emphasised by Barzilai (2004), who described this as a global phenomenon that transcends geographical boundaries. In retrospect, the findings suggest that the 2030 higher education vision can only be achieved by aligning the culture of individuals and in higher education with the vision within both their organisations and society. This assertion is supported by previous work by Eliot (2014), who demonstrated that an individual's culture is influenced by the group to which they are attached—in this context, the organisation and society. As such, influencing higher education institutions to achieve the 2030 vision underscores the leaders' role in fostering a positive reinforcing culture both within the limits of their organisations and outside in society.

As presented in Chapter 6, Sub-Section 6.3.3.1, participants highlighted culture's reinforcing influence on achieving the 2030 vision. Additionally, they also cited numerous Qatar-specific challenges that hindered the fostering of a cyberspace culture to facilitate implementing the vision. To begin with, it was argued that the population's conservative social-cultural background would negatively influence trust behaviour regarding the use of technologies for educational purposes. For instance, participants claimed that the use of web cameras for learning would be argued to contravene participants' privacy. A second reported challenge was that, since culture is only formed after a long period of time, risks of resistance develop within that period, thus hindering overall progress in cultural development. A third challenge concerns the lack of basic computing skills and knowledge among university students—an aspect that further exacerbates efforts to foster positive cyberspace culture. An in-depth analysis of these issues emphasises the need for frameworks to facilitate the adoption of positive cyberspace culture. For instance, to address privacy concerns and freedom of expression, researchers such as Goi (2009) have suggested incorporating cultural diversity and freedom of expression to help develop the proper cyberspace culture frameworks. Figure 7-15 below summarises the Qatar-specific challenges of fostering cyberspace culture:

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┌─────────────────────────┐
│  Conservative social-   │
│   cultural influences   │
└─────────────────────────┘

┌─────────────────────┐        ┌─────────────────────────┐
│ Challenges of       │        │  Long period of time to │
│ fostering           │────────│     foster culture      │
│ cyberspace culture  │        └─────────────────────────┘
│ in H.E.             │
│ institutions        │        ┌─────────────────────────┐
└─────────────────────┘        │  Lack of basic computing│
                               │  skills among university│
                               │        students          │
                               └─────────────────────────┘
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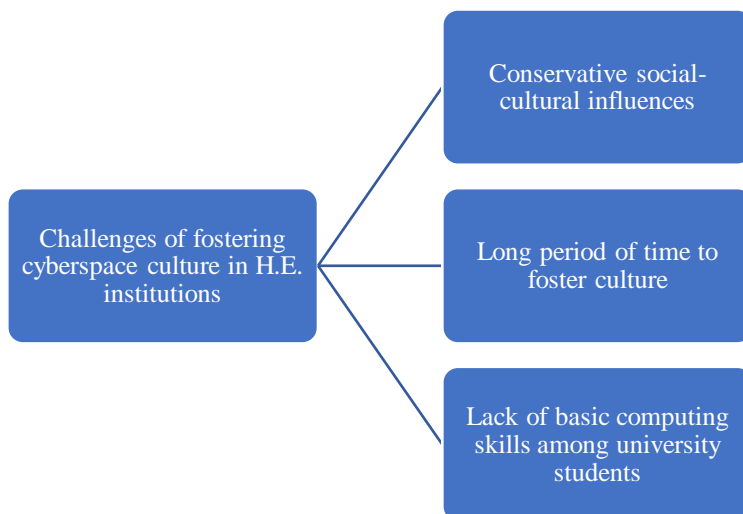
Figure 7-15: Challenges of fostering cyberspace culture in the Qatar context.

Source: The Researcher

To tackle these challenges, participants cited several recommendations, such as emphasising the leaders' role in guiding the fostering of cyberspace culture. The participants highlighted that leaders in particular possess an important responsibility for educating and supporting individuals in adopting the proper cyberspace culture. This finding aligns with Schein (1984), who previously reported that leaders play an important role in guiding their members to adopt positive behaviour and foster positive culture. A second solution is to create awareness campaigns, while a third involves increasing collaboration between the Ministry and higher education institutions in order to equip more students with the required technical skills. Figure 7-16 below illustrates the recommended solutions for improving cyberspace culture in the Qatar context:
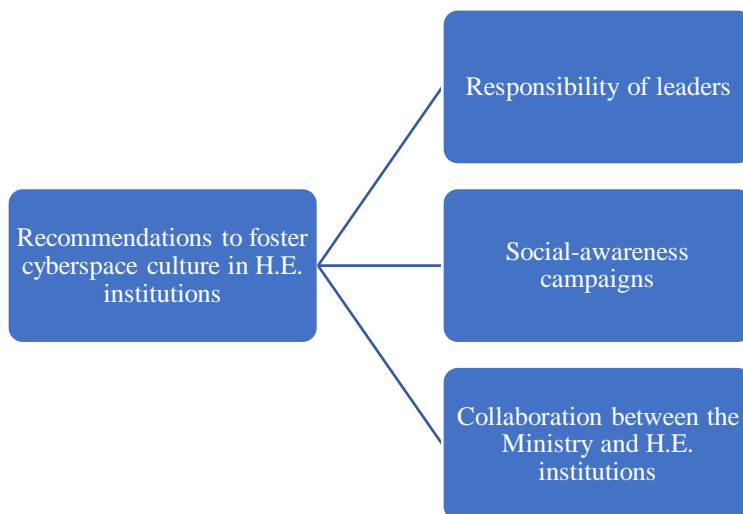
Figure 7-16: Solutions to foster cyberspace culture in the Qatar context.

Source: The Researcher

From the synthesis of the findings, it can be argued that, in order to create a reinforcing cyberspace culture in Qatar, an appropriate framework is required due to the multiple factors identified. In the following section, the validity of the proposed cyberspace culture framework is examined from the participants' perspectives.

7.2.4 Theme 4: Proposed Cyberspace Culture Framework

The final theme investigated the effectiveness of the proposed cyberspace culture framework (Figure 4-7) for aligning cyberspace culture with the 2030 higher education vision. To this end, a focus group comprising six participants was moderated. As the Researcher had already determined the influence of each factor (theme) on the attainment of the higher education vision (Sub-Sections 7.2.1–7.2.3), this section focusses on identifying any additions to or criticisms raised against the proposed cyberspace culture framework. Therefore, this section discusses the additional participant-highlighted aspects that should be covered in the proposed cyberspace culture framework to further enhance it in facilitating the attainment of the 2030 higher education vision.

7.2.4.1 Sub-Theme 1: Alignment of External Elements

The first sub-theme focussed on identifying the alignment between external elements and the attainment of the 2030 higher education vision. The main findings are summarised in the following sections. First, the alignment of the Vision 2030 directives with the 2030 higher education vision is illustrated in Figure 7-17:
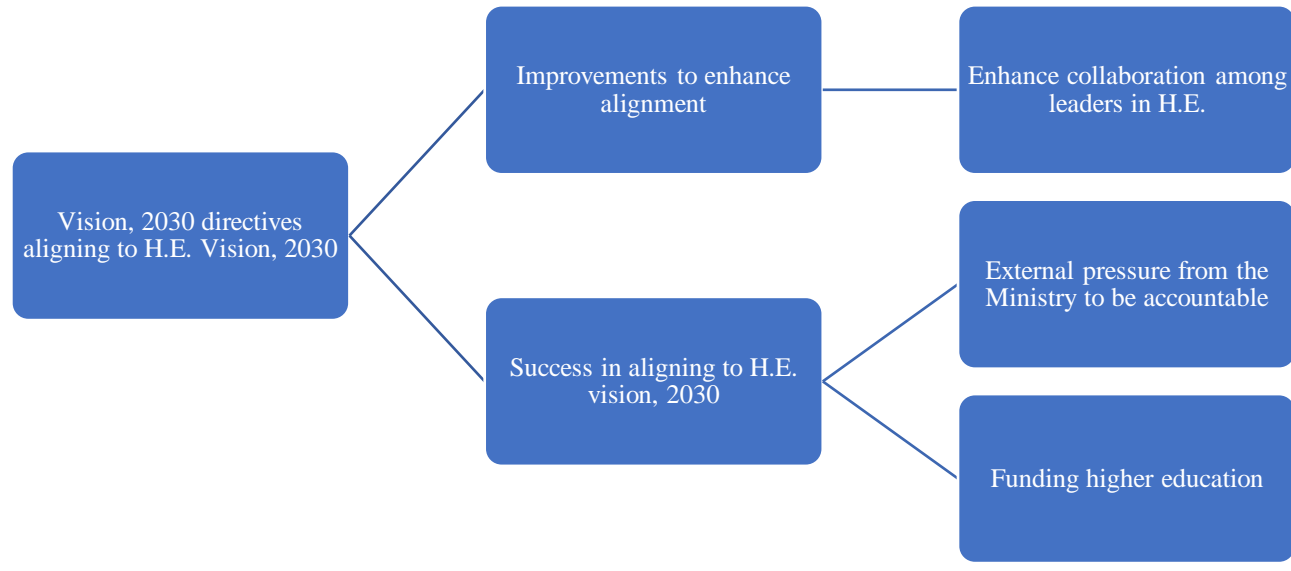
Figure 7-17: Alignment of Vision 2030 directives with the H.E. Vision, 2030.

Source: The Researcher

The findings indicate that the strategic directives are aligned with the 2030 higher education vision through the provision of funding and exertion of external pressure by the Ministry. This exertion of pressure aligns with Cantwell, Coate, and King (2018), who cited that obligatory pressure is necessary because the government funds institutions, thus requiring them to be accountable for their operations. Likewise, the provision of funding has also been reported in the QNV 2030, as the Qatar government seeks to develop the population through investment in scientific research and first-rate education (Qatar National Vision, 2030, 2008). However, a noteworthy challenge is that higher education leadership remains fragmented in Qatar, thus making it difficult to align cyberspace culture with the 2030 vision.

The alignment of technological advancement with the 2030 higher education vision was further examined with the findings summarised in Figure 7-18 below:
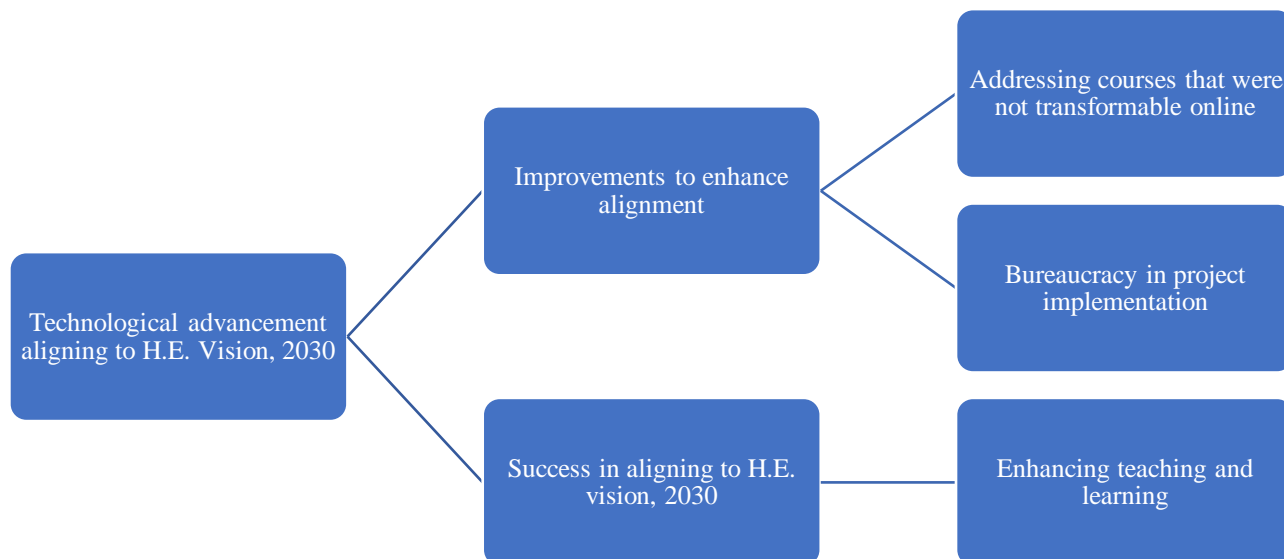
Figure 7-18: Alignment of technological advancement with the H.E. Vision, 2030.

Source: The Researcher

From the synthesis of the findings, it was observed that technological advancement is aligned with the 2030 higher education vision by enhancing learning and teaching. Such findings corroborate previous work by Talebian *et al.* (2014), who demonstrated that ICT technologies eliminate constraints of time and place in learning. Dunn and Kennedy (2019) likewise reported that technology-based learning enhances current educational models by shifting from teacher-centred to learner-centred approaches that are more self-paced and self-directed. Esteves, Matias, and Pereira (2018) added that collaborative learning mediated by technology allows learners to enhance soft skills such as oral communication and social interaction. Despite these benefits, however, two main challenges were reported in aligning technology with the 2030 vision: First, there is a need to consider courses that cannot be transformed online, and second, high bureaucracy levels were reported, as some projects have taken too long to launch.

The alignment of the Vision 2030 implementation framework with the 2030 higher education vision is displayed further in Figure 7-19:

Figure 7-19: Alignment of the Vision 2030 implementation framework with the H.E. Vision, 2030.

Source: The Researcher

From the findings obtained, the participants argued that, in order to improve the alignment between the Vision 2030 implementation framework and the 2030 higher education vision, it is necessary to incorporate performance measures to facilitate progress tracking.

7.2.4.2 Sub-Theme 2: Alignment of Internal Elements

The second sub-theme further investigated the alignment of internal elements with the attainment of the 2030 higher education vision. The alignment of each individual factor is reviewed in the section below. To begin with, the alignment of leadership and management strategies is detailed in Figure 7-20 below:
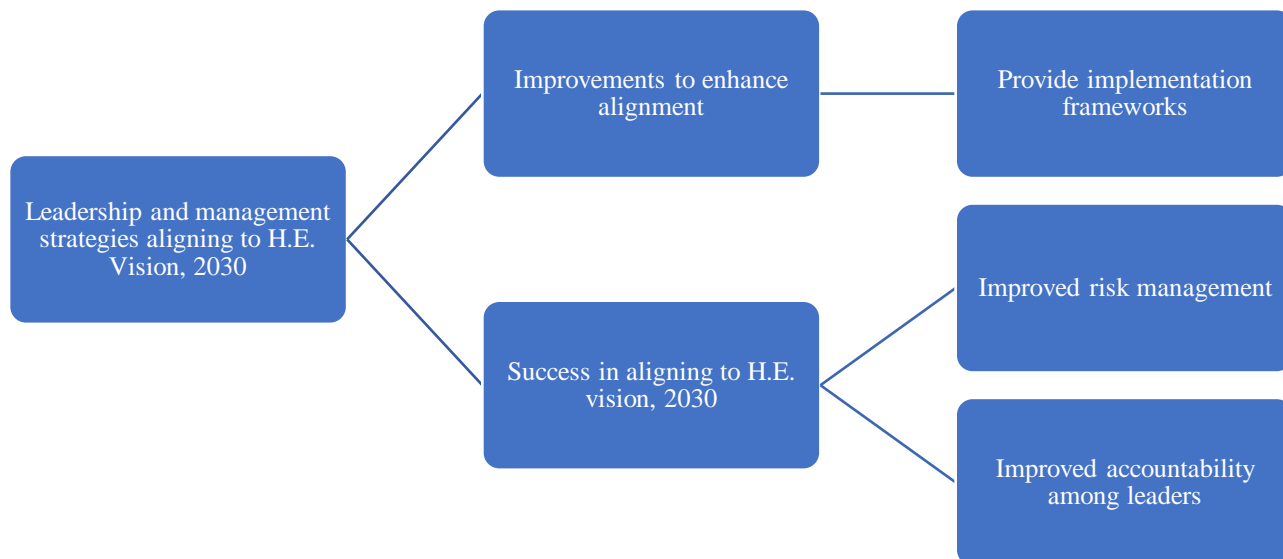
Figure 7-20: Alignment of leadership and management strategies with the H.E. Vision, 2030.

Source: The Researcher

The findings indicate that leaders in Qatar's higher education institutions have made substantial progress in aligning their leadership and management strategies with the 2030 vision by improving accountability and risk management. However, in order to further improve the alignment, the participants advocated for implementing frameworks to help identify possible risks as well as corrective actions to eliminate existing problems. The finding regarding the role of implementation frameworks has been highly emphasised in previous literature, such as in the development of the QNV 2030 by Qatar leadership to guide the implementation of strategic objectives for the four pillars—human, social, economic, and environmental (Qatar National Vision, 2030, 2008)—as well as in implementing different forms of technology-based learning, such as blended learning education (Garrison and Vaughan, 2013), blogging (Kerawalla *et al.*, 2009), and re-engineering of educational technology education (Kelley and Kellam, 2009).

Findings on security policy alignment with the 2030 higher education vision are illustrated further in Figure 7-20 below:
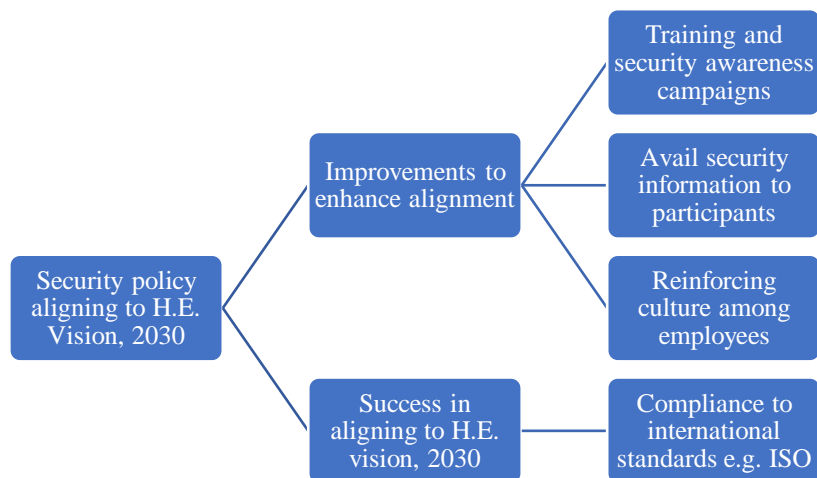
Figure 7-21: Alignment of security policy with the H.E. Vision, 2030.

Source: The Researcher

The findings indicate that most higher education institutions have successfully aligned their security policies with the 2030 vision by complying with international standards, such as ISO. Such findings echo previous research works (Landow, 1992; Apple and Jungck, 1996; Raschke, 2003; Aarseth, 1997) arguing the need for continuous learning, as identities in cyberspace are dynamic and not static due to technologies continually morphing. However, several challenges were noted, and recommendations were accordingly provided to improve the alignment of security policy with the 2030 higher education vision. The recommendations include providing more training and security awareness campaigns, providing security information, and fostering a security culture among employees.

Finally, the alignment between security technical best practices and the 2030 higher education vision is detailed in Figure 7-22 below:
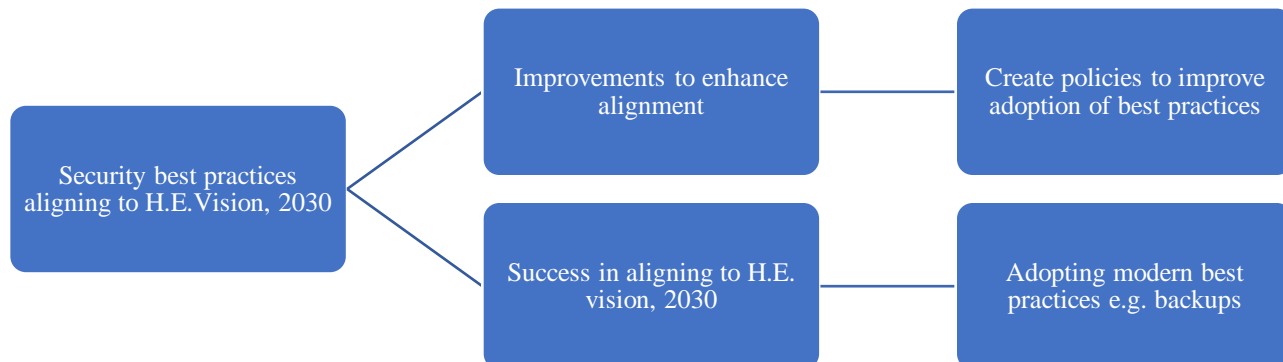
Figure 7-22: Alignment of security policy with the H.E. Vision, 2030.

Source: The Researcher

The findings demonstrate that, in most higher education institutions, modern best practices such as backing up data have been adopted. This finding matches those of researchers such as Gregg *et al.* (2017), who previously reported that most higher education institutions rely on major established tech vendors to facilitate implementing e-learning platforms due to their innovativeness and security. However, to improve alignment, the participants further cited the need to create security policies to improve the adoption of best practices.

7.2.4.3 Sub-Theme 3: Alignment of Culture

The final sub-theme considered the alignment of culture with the attainment of the 2030 higher education vision. Figure 7-23 summarises the findings as follows:
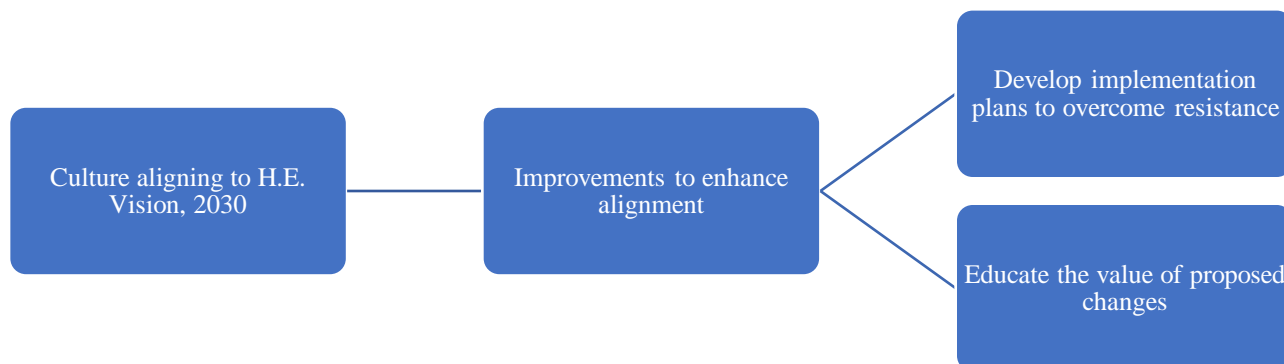
Figure 7-23: Alignment of culture with the H.E. Vision, 2030.

Source: The Researcher

The findings illustrate that the participants did not cite any successful incidences of the alignment of culture with the 2030 higher education vision. However, they emphasised the need to develop implementation plans to foster the proper cyberspace culture. Likewise, they also mentioned the need to educate employees regarding the value of adopting the proposed changes when a new culture is to be developed.

7.3 Validated Proposed Cyberspace Culture Framework

From the synthesis of the empirical research findings detailed in this chapter, the refined proposed cyberspace culture framework is presented in Appendix B. Furthermore, propose refinements from the analysis of empirical findings are provided alongside the individual elements in the originally proposed cyberspace culture framework (Figure 4-7).

Based on the analysis of the findings from the interviews and focus groups, several amendments to the proposed cyberspace culture framework were recommended (Figure 4-7).

7.3.1 Internal Elements

Concerning the internal elements, the participants confirmed that accountability and risk management represent important factors in leadership and management strategies. However, an additional factor was highlighted concerning the provision of an implementation framework to

guide the execution of various strategies. With the security policies, participants acknowledged that security awareness, continuous learning, and attitudes and behaviour influence the attainment of the higher education 2030 vision. However, to enhance their impact, there is a need to improve training and security awareness campaigns, provide security information to employees, and develop a reinforcing culture among employees. Finally, to further enhance security technical and best practices, participants cited that policies must be created that improve the adoption of the practices.

7.3.2 External Elements

Regarding the external elements, participants confirmed that the Vision 2030 directive, technological advancement, and the Vision 2030 implementation framework are important for achieving the Vision 2030 for higher education. To enhance the Vision 2030 directive, it was suggested for leaders to enhance collaboration with one another in different higher education organisations. Likewise, to improve technological advancement, participants mentioned the need to address courses that are not transformable online. Similarly, they also highlighted a need to address bureaucracy in the implementation of projects. Finally, to improve the Vision 2030 implementation framework, it was suggested to include performance measures in order to assess the overall progress made over time.

7.3.3 Culture

With culture, participants argued that implementation plans must be developed to help overcome resistance to the proposed challenges. Additionally, it was suggested that employees should be educated regarding the value of proposed changes to encourage overall adoption.

7.3.4 Refinement of the Proposed Cyberspace Culture Framework

Empirical findings contributing to the proposed framework are incorporated in this section to refine the framework further, thereby ensuring that it facilitates attaining the higher education 2030 vision. In the originally proposed cyberspace culture framework (Figure 4-7), the Researcher identified three constructs as influencing the implementation of the higher education 2030 vision:

1. External elements – Government's role, advanced technology, and the Vision 2030 implementation framework (Sub-Section 4.7.2).
2. Internal elements – Leadership and management strategies in higher education, security policies, and technical best practices (Sub-Section 4.7.1).

3. Cultural influences – Dimensions and levels of culture (Sub-Section 4.7.3).

Synthesis of the findings from the focus group discussions revealed that, in general, the participants agree that each of the constructs influences the attainment of the higher education vision. The evaluation of the findings in the chapter further reveals how each of the factors influences the attainment of that vision and the overall achievement of cyberspace culture. Such findings directly indicate the importance of cyberspace culture and partly answer the third research question. However, several gaps or aspects were identified where the framework could be refined further to facilitate attaining the higher education 2030 vision. Furthermore, refining the proposed cyberspace culture framework helped the Researcher to address the four research questions advanced in the research, as attaining the higher education vision is linked to achieving a positive cyberspace culture in Qatar. The refined proposed cyberspace culture framework is detailed in Figure 7-24 below:
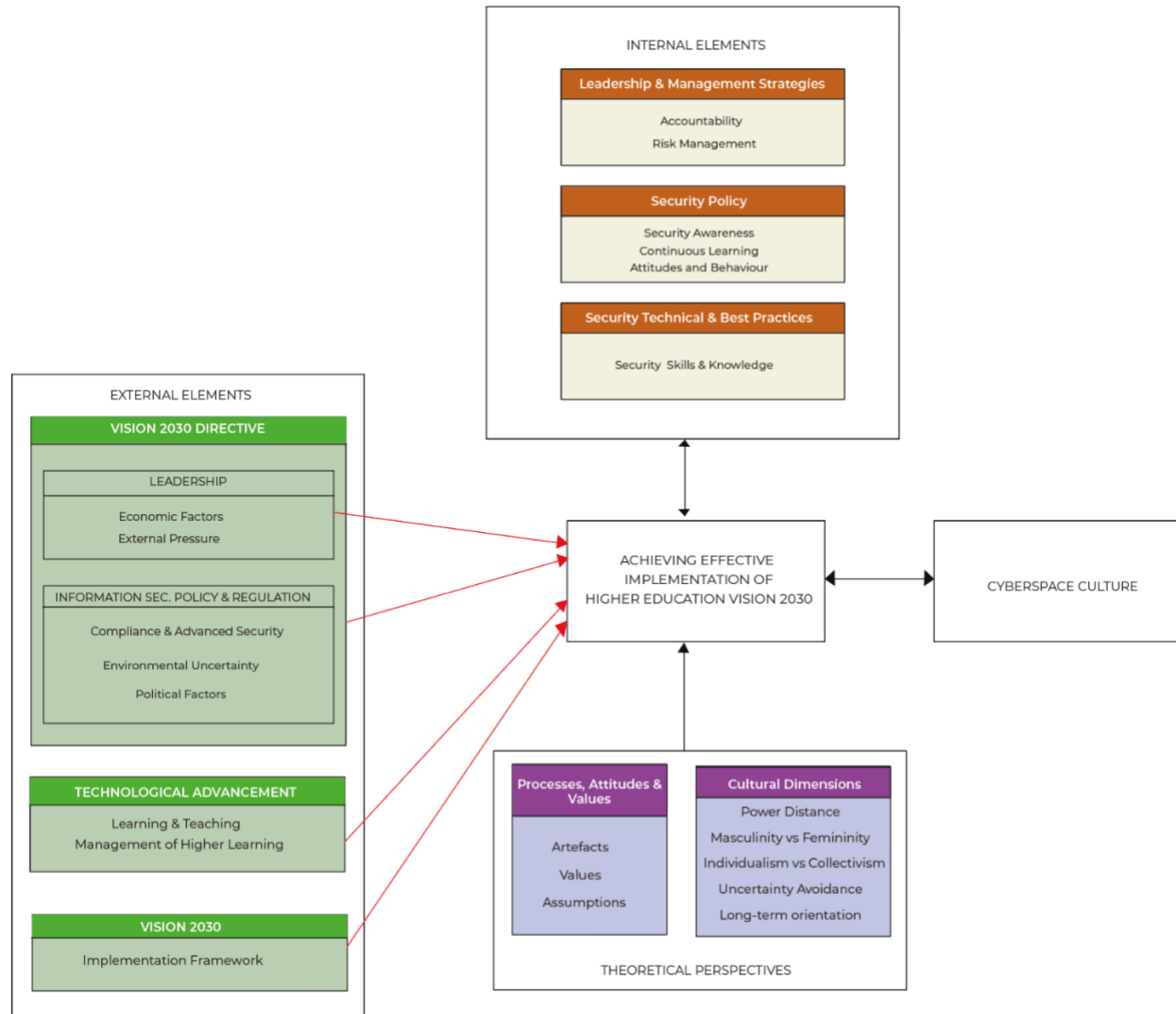
Figure 7-24: Validated proposed cyberspace culture framework.

Source: The Researcher

The side-by-side comparison of the proposed cyberspace culture framework (Figure 4-7) and validated proposed cyberspace culture framework (Figure 7-24) reveals that all components in the original framework have been maintained. However, in the validation of the framework, the bi-directional relationship between the external elements and the attainment of the higher education vision was modified to one that is uni-directional. This is because respondents argued that the achievement of the higher education 2030 vision would not influence aspects such as technological advancement or information security policies, as they are already independent.

The first research question, for instance, sought to identify the strategic alignment of cyberspace culture with the country's strategic directions. As these strategic directions are linked to the QNV 2030 and its implementation framework, the Researcher addressed this question by identifying how external elements (Vision 2030 directives and Vision 2030 implementation framework) influence the attainment of the higher education 2030 vision. The main findings indicate that the government's external pressure does influence the attainment of the higher education 2030 vision through obligatory and positive pressure, which ensures that institutions adhere to the guidelines and regulations set by the government in addition to achieving their own objectives. Likewise, government funding would enable institutions to acquire technologies and improve their sustainability and overall viability. However, a further refinement was also suggested—namely, fostering more enhanced collaboration among leadership of higher education institutions, as this remains fragmented. Technology was also observed to influence the achievement of the higher education 2030 vision by enhancing learning, teaching, and management of institutions. To further enhance the role of technology, a few refinements were suggested, such as eliminating bureaucracy in the implementation of technology projects and developing strategies to address courses that are not transformable into online platforms. Furthermore, the findings revealed that the Vision 2030 implementation framework serves an important role in guiding higher education institutions. To enhance the framework further, performance measures were suggested to track overall progress. By adding these refinements, the Researcher argues that the country's strategic directions will be aligned with the cyberspace culture.

Beyond this, several refinements were also identified regarding the internal elements, which included the leadership and management strategies in higher education, security policies, and technical best practices. Regarding leadership and management of higher education institutions, the findings reveal that this factor has influenced the attainment of the higher education 2030 vision, as leaders have become more accountable and manage risks in their organisations. However, a persistent gap is noted concerning the lack of implementation frameworks to facilitate attaining various strategic objectives. Second, security policy was also found to positively influence the achievement of Vision 2030, as institutions have become more aware of cybersecurity risks and have also complied with global security standards, such as ISO. However, to further enhance the role of the Vision 2030 implementation framework, recommendations such as improving training and security awareness, availing security information, and reinforcing security culture among employees were made. With respect to best practices, refinements such as creating reinforcing policies to guide their adoption in higher education institutions were suggested. In relation to the final construct on culture, the following refinements were suggested: Developing implementation plans to overcome employees' resistance and educating employees regarding the value of the proposed changes.

Continuing, refining the external and internal elements of the proposed cyberspace culture framework and cultural factors helps address the fourth research question in the research, which sought to identify the type of cyberspace strategy that the government should deploy to align its strategic directions. Additionally, findings revealed an existent bi-directional relationship between the constructs and the attainment of the higher education 2030 vision. With the external elements, the findings indicate that, as the individual factors (government strategic directives, technological advancement, and Vision 2030 implementation framework) influence the achievement of the higher education 2030 vision, this achievement will also positively influence the various factors. For instance, a slow pace of achieving the higher education 2030 vision could lead to improved strategies for implementing technologies for teaching, learning, and overall management of the institutions. Such aspects subsequently emphasise the current bi-directional relationship between the constructs and the achievement of the higher education 2030 vision.

7.4 Implementation Guidance

As presented in Chapter 1, Section 1.4, the primary goals of this research were to investigate the strategic approach to cyberspace culture and its alignment with Qatar's strategic direction, as well as to develop an effective framework for aligning cyberspace culture with the vision of Qatar's strategic direction, supported by implementation guidance focussed primarily on the higher education sector. In this section, a road map is presented detailing the various ways in which the proposed framework can be utilised.

7.4.1 Role of the Government (Vision 2030 Directive)

Based on the evaluation of the findings, the following contributions can be attributed to the government (Vision 2030 directive):

- Provide funding to support the operations of higher education institutions, such as to set up more institutions; expand their scientific research departments; and acquire necessary technology and infrastructure to support learning, teaching, and management of higher education institutions. This arises from the fact that all respondents agreed that funding is crucial to the success of higher education and the achievement of Vision 2030.

- Increase collaboration with higher education institutions in formulating policies and developing frameworks that guide the implementation of different aspects, such as advanced security features that meet international standards in the institutions. In the research, participants argued that leadership in higher education institutions is fragmented, thus derailing the standardisation of policies and implementation frameworks. Therefore, there is a need to increase collaboration between higher education institutions and the government in order to facilitate the development of policies and frameworks.

- Serve as an oversight authority that supervises the actions of all stakeholders in the higher education sector in order to boost fair treatment and prevent any nefarious activities, such as cybercrime. As the government represents a key stakeholder in cyberspace, its oversight authority can ensure that all higher education institutions receive fair treatment in terms of resource allocation and research opportunities.

- Formulate regulation, which fosters a conducive and enabling environment for higher education institutions to avoid unprecedented effects from environmental uncertainty, such as abrupt changes in the institutions' leadership. This is because respondents argued that

environmental uncertainty arising from political influences can derail the attainment of the higher education 2030 vision.

- Develop KPIs for the QNV 2030 to facilitate the evaluation of its progress over time and to further outline milestones that help track progress. Respondents in the research cited that, although the QNV 2030 is well-meaning in enhancing the economy, it still lacks milestones to track its progress. Such performance measures should be instituted to guide higher education institutions in assessing the progress of attaining their own vision.

7.4.2 Role of Higher Education Leadership

To achieve the higher education 2030 vision, the following roles are advocated for the leadership in higher education institutions, as leadership plays an important role as an internal element of the proposed cyberspace culture framework:

- Collaborate in developing frameworks to enable leaders to implement different strategic objectives. This assertion arose from findings in the research, which demonstrated that leaders are challenged, and thus require guidance in achieving strategic objectives.
- Provide necessary training and resources for leaders in higher education institutions to equip them with skills necessary to guide employees towards achieving strategic objectives. This is because respondents highlighted that leaders require support in terms of training to enable them to attain strategic objectives.
- Contextualise security best practices to Qatar's social-cultural environment in order to guarantee their success in local higher education institutions. The participants argued that adopting the proper security and technical best practices was not enough, as they would only succeed where they aligned with the culture of Qatari higher education institutions.
- Tackle the challenge of bureaucracy associated with updating existing security policies to align with requirements in the market. Respondents argued that the approval process involved in updating security policies is highly bureaucratic and can derail actual approvals. Therefore, it is expedient to fast-track the process in order to ensure that security policies adhere to market demands.

7.4.3 Role of the Culture in Organisations

The culture of higher education institutions plays an essential role in achieving the higher education 2030 vision. The following directives are accordingly advocated to ensure that culture is well cultivated to facilitate the achievement of that vision:

- Ensure that leaders in higher education institutions take responsibility for educating employees on cyberspace aspects in order to foster a positive cyberspace culture and enable them to adopt appropriate change-management practices.
- Promote campaigns to facilitate social behaviour change among employees in higher education institutions in an effort to enable them to develop the proper type of cyberspace culture. The reported findings indicate that most negative actions in cyberspace arise from the fact that employees remain unaware of their impact. Therefore, there is a need to undertake social campaigns to promote behaviour change among employees.
- Improve collaboration between the Ministry and the higher education sector in order to equip employees with better technology skills.

7.5 Conclusion

Based on the analysis of empirical findings in this chapter, several fundamental findings have been reported: First, each of the individual elements in the proposed cyberspace culture framework (internal, external, and culture) appear to influence the attainment of the 2030 higher education vision. With the external elements, the government's oversight authority as a regulator and financier of Qatar's higher education sector possesses significant implications for the industry's growth. Qatar's Higher Education Ministry also plays a role in promoting the adoption of cyberspace culture by providing funding to acquire necessary technologies and by facilitating partnerships between higher education institutions and other international companies. Furthermore, the Vision 2030 implementation framework also serves as an important guide to aid the development of cyberspace culture by specifying what actions should be taken in institutions. Technological advancement, meanwhile, both enhances the management of learning institutions and improves the management and overall administration of those institutions.

Therefore, the external environment in which higher education operates considerably influences the attainment of the 2030 higher education vision as well as the overall creation of cyberspace

culture. However, to further improve the alignment of external elements with the 2030 vision for higher education, collaboration among leaders in higher education must be improved, as leadership currently remains fragmented. Additionally, performance measures should also be incorporated into the Vision 2030 implementation framework in order to facilitate the tracking of overall progress. Likewise, to enhance the adoption of technology, bureaucracy must be eliminated to fast-track such processes. Furthermore, courses that are not directly transformable into online platforms should be reviewed in order to identify optimal strategies to launch them into cyberspace.

Internal elements such as leadership and management strategies also influence the attainment of the 2030 higher education vision, as leaders steer their organisations to achieve targeted objectives. However, it was observed that implementation frameworks are required to help facilitate the process. Security policies are further observed to influence employees' security behaviours and attitudes as well as to raise awareness of security matters in higher education institutions. However, their implementation remains challenged by the lack of training and security knowledge. These factors should be addressed to improve overall attainment of the 2030 vision. Moreover, security best practices should be implemented alongside security policies to guide their adoption in the institutions. Finally, to improve the culture's influence on attaining the 2030 higher education vision, implementation frameworks must be adopted that help minimise the threat of resistance from employees. Likewise, educating employees on the value of new changes in cyberspace should also be emphasised to improve alignment with the 2030 vision.

In summary, the proposed cyberspace culture framework illustrated in Figure 7-24 has been refined further to facilitate attaining the 2030 higher education vision and to aid the formation of cyberspace culture.

Chapter 8: Conclusion and Recommendations

8.1 Introduction

In this chapter, the findings obtained in the research are synthesised in order to outline evidence regarding how the aim and objectives of the research were fulfilled. In particular, the Researcher describes how the research aims were fulfilled as well as the investigation process adopted to address research objectives and research questions. Additionally, the research's contributions to theory and practice and its potential impact are outlined. Beyond this, limitations that challenged this research are also described.

The chapter is sub-divided into seven sections: In Sections 8.2, 8.3, and 8.4, the Researcher describes how the results address the research aims, objectives, and questions. Limitations that challenged the research are further outlined in Section 8.5. Thereafter, in Sections 8.6 and 8.7, the research's contributions to practice and theory are discussed, and Section 8.8 highlights various recommendations from the research. Finally, Section 8.9 details the main conclusion of the research.

The following sections describe how the research results were identified in the research aims, objectives, and questions.

8.2 Results Determined by Research Aim (Chapter 1, Section 1.4)

In Chapter 1, Section 1.4, the research aim guiding this research undertaking was detailed as follows: To investigate the strategic approach to cyberspace culture and its alignment with Qatar's strategic direction and to develop an effective framework for aligning cyberspace culture with the vision of Qatar's strategic direction, supported by implementation guidance focussed primarily on the higher education sector. At an in-depth level, the research aim can be broken down into two parts:

Part 1: The first part of the research aim focusses on investigating the strategic approach to cyberspace culture and its alignment with Qatar's strategic direction. In addressing the research aim, and due to the lack of literature on the subject, this thesis began by conceptualising its own definition of cyberspace culture by merging the concepts of cyberspace and culture. To identify the strategic approach to developing cyberspace culture, previous literature and diverse

information security frameworks were examined. The reviewed literature provided important insights into the conceptualisation of the strategic approach to cybersecurity, cyberspace management, and information security culture. With this understanding, various strategic components of cyberspace culture were outlined, and a proposed cyberspace culture framework was developed. Findings from the respondents further revealed an alignment between the proposed strategic approach to cyberspace culture and the strategic directions in Qatar as guided by the pillars of the QNV 2030. Similarity was also observed between the findings from primary research and prior literature. However, several differences were also reported, considered the research contributions.

Part 2: The second part of the research aim emphasises the development of an effective framework for aligning cyberspace culture with the vision of Qatar's strategic direction, supported by implementation guidance focussed primarily on the higher education sector. With the first part of the research aim addressed, various components regarding the strategic approach to cyberspace culture were identified. Likewise, the examination of existing information security frameworks revealed various existent gaps that were yet to be addressed as well as an apparent lack of implementation guidance for the higher education sector. The Researcher accordingly synthesised the findings from the literature review (derivate one), information security frameworks (derivate two), and research gaps in the reviewed frameworks (derivate three) to conceptualise the proposed cyberspace culture framework (Figure 4-7). The developed framework included three elements: a) external elements (Vision 2030 directive, technological advancement, and Vision 2030); b) internal elements (leadership and management strategies, security policy, and security technical and best practices); and c) cultural influence. Findings from the respondents revealed that the framework is effective in aligning cyberspace culture with Qatar's strategic direction. Additionally, respondents highlighted important refinements to the proposed framework in order to enhance it and facilitate attaining the higher education 2030 vision. Implementation guidance for the developed framework was also provided whereby the actions of various actors were outlined in the higher education sector.

In achieving the research aim, this thesis highlights various strategic components of cyberspace culture by deriving a cyberspace culture framework in Figure 4-7 and further refining it in Figure

7-24. This framework is supported by findings from previous literature and seeks to bridge the research gaps in current information security frameworks. The findings from respondents further revealed that the framework is effective in aligning cyberspace culture with the vision of Qatar's strategic direction, thereby validating it. In the next section, the results are detailed per research objective.

8.3 Results Determined by Research Objectives (Chapter 1, Section 1.5)

This section presents a discussion of the results obtained by addressing the research objectives formulated in Chapter 1, Section 1.5.

Research Objective 1: The first research objective (Chapter 1, Section 1.5) sought to evaluate the alignment of existing cyberspace culture with the strategic vision in Qatar. However, to identify this alignment, it was important to define cyberspace culture and strategic vision. In Chapter 1, debates among academics and various practitioners regarding the emergence of cyberspace as a defining aspect of modern life were accordingly highlighted. Similarly, various components of cyberspace ranging from telecommunications devices, physical infrastructures, and computerised systems to associated software, networks linking computer systems together, and the data residing in those systems were identified. Cyberspace culture's role in guiding the actions of actors in the digital space was also delineated based on its definition as a set of beliefs that emerge through computer-mediated interaction.

In Chapter 2, the review of literature on cyberspace culture highlighted various advances that have emerged in the field as well as challenges affecting its evolution. Additionally, the review of the QNV 2030 led to the identification of various strategic visions of the Qatar government in transforming its economy into one that is knowledge-based. Therefore, to address this objective, focus was placed on identifying the alignment between cyberspace culture as a set of beliefs and the strategic visions specified in the QNV 2030. However, the findings from previous literature revealed several gaps in the alignment between existing cyberspace culture and the QNV 2030's strategic visions regarding aspects such as a lack of clear governance, guidance on the application of cyberspace, and the development of infrastructure.

In Chapter 3, similar findings were observed: Specifically, the review highlighted current literature research gaps in cyberspace culture and the attainment of strategic visions in higher education. Notable research gaps included the lack of guidance in using cyberspace for authorship, teaching, and learning as well as in the selection of best practices to facilitate attaining strategic visions. Therefore, the key findings emphasised that research gaps existed regarding the alignment of current cyberspace culture with strategic visions. A lack of guidance in using cyberspace, authoring content, and best practices represent some of the highlighted issues.

Research Objective 2: The second research objective (Chapter 1, Section 1.5) identified the strengths and weaknesses of the current cyberspace culture frameworks and their alignment with the strategic directions of the country (Qatar). This objective was met by examining previous frameworks detailed in Chapter 4. To this end, four frameworks were examined: 1) the ISF framework (Alnatheer and Nelson, 2009); 2) the ISCF framework (Da Veiga, 2008); 3) the Information Security Culture framework (Shabbaan, 2014); and 4) the Information Security Framework – STOPE (Al-Hogail, 2015). The evaluation of the different cyberspace culture frameworks subsequently revealed that each framework was effective in its own way at aligning with the strategic directions of different organisations. The ISF framework, for instance, identifies the role of leadership, government regulation, security culture, management, and organisation culture in fostering cyberspace culture. However, an emergent gap was observed in the frameworks in that they do not focus on the role of the human factor in fostering cyberspace culture; rather, they primarily focus on technical aspects. Furthermore, in Chapter 4, Table 4-3, the results suggest that none of the frameworks detail all aspects required to address existent cyberspace culture gaps highlighted in Chapter 2. Therefore, the frameworks fail to align with the strategic directions in the country, thereby requiring the development of the proposed cyberspace culture framework.

In Section 3.3, meanwhile, several literature gaps were identified regarding cyberspace culture and higher education. The first concerned the lack of frameworks guiding both parties in aligning cyberspace culture to the established goals. A second research gap concerned whether Qatar would rely on dominant entities to supply educational technology in order to facilitate attaining the QNV 2030 in higher education. Third, a research gap was also identified in guiding authorship among teachers in the digital landscape. Therefore, to address the second and third research gaps, the

Researcher identified a gap in creating frameworks and best practices that will foster positive cyberspace culture to boost the attainment of the QNV 2030. Beyond this, in quadrant IV, a fourth research gap was also identified concerning how cyberspace influences identity formation.

The results obtained for research objectives 1 and 2 were argued to address the various research gaps identified in the literature. For instance, in addressing the first gap, the findings revealed that, although frameworks existed for aligning cyberspace culture to strategic goals, they primarily focussed on technical aspects while ignoring the impact of the human factor. Therefore, this required developing a cyberspace culture framework. In turn, this helped address the second and third research gaps in the literature. By extension, the developed framework would also facilitate addressing cyberspace's influence on identity formation, thereby solving the fourth research gap.

Research Objective 3: The third research objective (Chapter 1, Section 1.5) analysed the current strategic approach to cyberspace culture and its alignment with the country's strategic directions. To address the objective, both literature findings and primary research were synthesised. From the literature review, it emerged that existent cyberspace culture frameworks are not effective in aligning with the country's strategic directions, as most authors focus on the technical aspects of cyberspace and direct less attention to human factors. As the review of the QNV 2030 revealed that the human development pillar is important for achieving Vision 2030, the failure of current frameworks to address human aspects in cyberspace culture means that the approach is ineffective in aligning with the country's strategic objectives. From primary research, respondents also highlighted gaps in the current strategic approach to cyberspace culture, citing aspects such as a lack of clear guidelines for using cyberspace and a lack of leadership and governance in cyberspace. The findings consequently emphasised the need to develop a more effective cyberspace culture framework to capture all necessary requirements that would ensure alignment with the country's strategic directives.

Research Objective 4: The fourth research objective (Chapter 1, Section 1.5) evaluated the Qatar Vision, 2030 cyberspace strategy and how it is influenced by attaining the higher education 2030 vision. In Chapter 2, Section 2.4, the review of the literature concerning the QNV 2030 revealed four pillars of the Vision 2030 strategy: human, economic, social, and environmental. Further

review indicated that cyberspace culture is linked to the attainment of the QNV 2030's strategic objectives concerning economic development, delivery of social services, and education development. Given that higher education serves as the engine of the economy in delivering skilled workers to drive businesses and social services in Qatar, the QNV 2030's cyberspace strategy is directly influenced by the achievement of the higher education 2030 vision. Additionally, findings from the participants further confirm that attaining the higher education vision in terms of using technology to deliver learning, to teach, and to manage higher education institutions improves higher education institutions' effectiveness in upskilling the population, and thus in driving a knowledge-based economy.

However, in Chapter 3, a literature evaluation revealed gaps in the current cyberspace strategy adopted in higher education institutions in Qatar. For instance, they lack frameworks to align cyberspace culture with strategic goals, to guide the actions of educators and learners in the digital space, and to enable novice learners to enhance their expertise in cyberspace. Addressing these gaps through the proposed cyberspace culture framework (Chapter 4, Figure 4-7) would thus ensure not only the attainment of the higher education vision, but also the achievement of the QNV 2030's strategic goals.

8.4 Results Determined by Research Questions (Chapter 1, Section 1.6)

The research questions re-addressed the research objectives and further focussed on the research aims. In this section, a discussion is undertaken regarding the results achieved from addressing the research questions.

Research Question 1 (Chapter 1, Section 1.6)**:** *How does cyberspace culture strategically align with the country's strategic directions?*

This research question re-addresses the first research objective. In the context of Qatar, it emerged that cyberspace culture does not effectively align with the country's strategic directions, as several research gaps were identified. The evaluation of the QNV 2030, meanwhile, revealed that, in achieving its strategic objectives of transforming Qatar's economy from one that is hydro-carbon-based into one that is knowledge-based, the country primarily focusses on technical measures, such as a) investment in necessary infrastructure and technologies and b) collaboration with

different international stakeholders. Additionally, it was observed that Qatar has made important strides in enhancing aspects such as cybersecurity by passing important laws and developing frameworks, such as the Qatar 2022 Cybersecurity framework in preparation for the FIFA 2022 World Cup.

However, despite Qatar's progress in acquiring necessary technological infrastructure and enhancing cybersecurity, the review further demonstrated that important concerns regarding the human factor in cyberspace have not been adequately addressed. Specifically, the evaluation of Qatar's cyberspace strategy revealed gaps in guiding the actions of learners, educators, authors, and scientists in cyberspace, which must be addressed to effectively align cyberspace culture with the country's strategic directions.

Research Question 2 (Chapter 1, Section 1.6)**:** *How are current cyberspace culture frameworks aligned with the country's strategic directions?*

To address this research question, current cyberspace culture frameworks (Chapter 4) were examined to establish their alignment with the country's strategic directions. To this end, four frameworks were examined: 1) the ISF framework (Alnatheer and Nelson, 2009), 2) the ISCF framework (Da Veiga, 2008), 3) the Information Security Culture framework (Shabbaan, 2014), and 4) the Information Security framework – STOPE (Al-Hogail, 2015). As Qatar's strategic directions primarily focus on transforming the economy into one that is knowledge-based, the evaluation of the frameworks revealed that none of the frameworks address all requirements needed to foster cyberspace culture. The targeted requirements include 1) leadership, 2) policy, 3) technical competency, 4) government regulation, 5) organisation culture, 6) management, 7) security culture, and 8) change management. Analysis revealed that the frameworks largely ignore the human aspect in cyberspace, which is emphasised in the country's strategic directions in aspects such as 1) delivering learning and teaching in cyberspace, 2) authorship in cyberspace, and 3) using cyberspace to guide novice learners to attain expertise in cyberspace.

Research Question 3 (Chapter 1, Section 1.6)**:** *Why is cyberspace culture important, and what literature gaps exist regarding cyberspace culture?*

Based on the evaluation of literature, cyberspace culture was identified as crucial, primarily in guiding the actions of actors in cyberspace. In the context of higher education in Qatar, this largely includes learners, educators, and management who rely on computer-mediated technology to achieve their strategic objectives in higher education institutions. Aside from higher education, cyberspace culture is also influential in facilitating the service industry, such as in the delivery of e-government services to SMEs and the population. In other economic sectors, businesses leverage positive cyberspace culture to enhance decision-making and boost economic competitiveness. Therefore, different types of businesses (higher education, service industries) rely on positive cyberspace culture to achieve their strategic objectives. However, notable gaps in literature were also identified, such as the lack of frameworks to align cyberspace culture with strategic objectives and to ensure the protection of actors in cyberspace.

Research Question 4 (Chapter 1, Section 1.6)**:** *What type of cyberspace strategy should the government deploy to align with the country's strategic directions?*

To address this research question, the findings from primary research and the literature were examined. The literature evaluation in Section 3.3 accordingly revealed a need for the government to develop implementation frameworks to guide the use of cyberspace as a learning tool for educators and learners. These frameworks would provide clarity on aspects such as content delivery, authorship in the digital landscape, and the adoption of best practices concerning the use of technology to achieve strategic objectives. Participants further added that it is important for the government to provide support for the acquisition of necessary technological infrastructure in higher education institutions through funding. The government's role in creating a conducive operational environment was also emphasised through aspects such as passing regulation to ensure fairness and enhancing collaboration with external parties from international regions.

8.5 Research Limitations

Despite addressing the research objectives, the research remained limited by several factors. In this section, the limitations encountered in the literature search and the research design are detailed. It is worth noting that in Chapter 1, Section 1.9, the Researcher outlined the limitations that were

anticipated in conducting the research. This section, however, discusses the limitations that were actually encountered in completing this research.

8.5.1 Limitations in Literature Search

In the literature-examination process, the research was limited by the lack of similar empirical studies on cyberspace culture that had been conducted in Qatar's higher education. Specifically, the Researcher noted a lack of studies that provide an official definition of cyberspace culture as well as previous research that examines the thematic issue in higher education. To compensate for this limitation, the researcher developed a definition of cyberspace culture (Sub-Section 2.2.5) that was utilised in the context of this thesis. Likewise, due to the limited number of available literature regarding cyberspace culture in Qatar, the researcher expanded the scope to consider studies that had also been undertaken in Gulf region countries, such as Saudi Arabia.

A second limitation is that, although the Researcher focussed on gathering literature from the past three decades (1990 to date), the constraint of the research timeline restricted this thesis to focussing primarily on recent literature in the current decade. This limitation arose from the fact that most studies detailing the use of cyberspace for learning and teaching concentrated on the current decade (2010 to 2020). Therefore, there was a likelihood of research bias, as literature from the past two decades was scant. However, the Researcher acknowledged the restriction and focussed on ensuring that a balanced literature review was undertaken.

8.5.2 Limitations in Research Design

The Researcher largely collected qualitative data by conducting semi-structured interviews and moderating a focus group. The first limitation encountered in this regard pertained to the COVID-19 pandemic, which made it difficult to conduct one-on-one sessions with the selected participants. To overcome this limitation, the Researcher utilised online tools such as Microsoft Online Calls to engage with the participants.

Second, the COVID-19 pandemic also made it difficult for the researcher to obtain a larger sample for the research purpose. This is because the onset of the pandemic led to the closure of most higher education institutions and a consequent difficulty in accessing their senior staff, who were the target audience for this research. However, the Researcher overcame this limitation by contacting

the research participants directly via email. As a result, 18 participants were interviewed, and a focus group comprising of six members was moderated.

Third, the reliance on solely qualitative data also introduced a limitation of possible subjectivity and the risk of Researcher bias. However, as the Researcher acknowledged this restriction, secondary literature was also reviewed in order to confirm the results from primary data. Finally, the proposed cyberspace culture framework was also limited due to having not been empirically tested in the real-life context. As a result, it relies solely on empirical results and previous literature to validate the research.

8.6 Research Contribution

This section details the theoretical and practical contributions identified from this research undertaking. Theoretical contributions generally describe the new insights and knowledge derived from the research whereas practical contributions comprise the actionable insights that can be adopted by stakeholders in Qatar's cyberspace industry.

8.6.1 Theoretical Contribution

The current research makes key contributions to theory in terms of understanding cyberspace culture and framing its association with the achievement of strategic objectives.

1) **Broader understanding of cyberspace culture:** This research acknowledges the lack of diverse literature related to cyberspace culture. However, by examining a wide range of literature sources, this thesis provides a broader understanding of cyberspace culture and its influence on the achievement of strategic objectives.

2) **Theoretical reframing of the relationship between cyberspace culture and strategic directions:** This research provides a holistic understanding of the influence that cyberspace culture exerts on the achievement of strategic objectives set by either organisations or the government as a whole. This research further revealed that cyberspace culture is important not only in guiding the actions of actors in an abstract digital space, but also for ensuring that their sensitive information remains protected from threats in the digital landscape.

3) **Identification of knowledge gaps:** This thesis demonstrates that current cyberspace culture frameworks neglect the human aspect in cyberspace by failing to guide the attitudes and actions of individuals in the digital landscape. Additional literature gaps regarding the

development of implementation frameworks were also emphasised, thereby highlighting the need to develop more effective frameworks to guide the alignment of cyberspace culture and strategic objectives.

4) **Development of a conceptual framework:** This research developed the proposed cyberspace culture framework (Chapter 4, Figure 4-7), which indicates the various core elements required to facilitate the attainment of the higher education 2030 vision and to consequently foster a positive and reinforcing cyberspace culture.

8.6.2 Practical Contribution

This section details actionable insights that can be directly adopted by stakeholders in Qatar's higher education sector regarding the utilisation of cyberspace. These insights include a range of factors from the validation of the cyberspace culture framework to the government's role in guiding the development of cyberspace culture.

1) **Development of a cyberspace culture implementation framework:** The research developed an implementation framework to guide the attainment of the higher education 2030 vision. This framework provides implementation guidance to facilitate the development of cyberspace culture and further outlines the responsibilities of different stakeholders in cyberspace, such as the government and management of higher education institutions.

2) **Validation of the cyberspace culture framework in achieving the higher education 2030 vision:** In this research, the proposed cyberspace culture framework was validated from the analysis of the interviewee responses and focus group discussions. The direct implication is that the research highlights two key stakeholders—the government (Vision 2030 directive) and higher education leadership—as the most important players for achieving the higher education 2030 vision. Implementation guidance is subsequently provided in Chapter 7, Sub-Section 7.4.1 for the government and Chapter 7, Sub-Section 7.4.2 for higher education leadership. For instance, identified guidance for the government includes funding, increasing collaboration with international parties, and acting as an oversight authority for the institutions. Likewise, guidance for higher education leadership includes adopting best security practices and enhancing training.

3) **Conclusion that current cyberspace culture frameworks are ineffective in aligning strategic objectives:** This research demonstrates that currently utilised cyberspace culture frameworks are highly technical in nature, and thus fail to address concerns regarding the human factors in cyberspace. The proposed cyberspace culture framework, however, emphasises the need for culture in guiding the attitudes, actions, and behaviour of employees. In effect, the proposed framework addresses the existent gap regarding the lack of human factors in fostering cyberspace culture.

4) **Empirical evidence of the government's role in the development of cyberspace culture:** This research further indicates that, in order to achieve the QNV 2030, the government must play a leading role in funding higher education institutions, serve in a supervisory role to guide institutions, pass fair regulations to facilitate the uptake of best practices, and facilitate collaboration with other international stakeholders to enhance cyberspace culture in Qatar.

5) **Empirical evidence of the role of organisational culture in reinforcing cyberspace culture:** Next, this research revealed that, at the foundational level, cyberspace culture can only be fostered when individual attitudes and behaviours are modified towards the change. To that end, the role of organisational culture in guiding employee cyberspace actions is emphasised in this research.

6) **Link between the attainment of the higher education 2030 vision and the QNV 2030:** This research also suggests that attaining the higher education 2030 vision directly influences the successful achievement of the QNV 2030 because better education systems serve as the engine of the economy. Furthermore, the population becoming more learned and competent in leveraging cyberspace to achieve strategic objectives has also fuelled the QNV 2030, thereby leading to the economy's transformation into one that is knowledge-based. In this regard, the achievement of higher education goals facilitates attaining the QNV 2030 by producing a highly learned population that can manage diverse aspects of the economy by leveraging advanced technology.

8.7 Recommendations

The research has proposed the cyberspace culture framework as a solution to facilitate achieving the higher education 2030 vision and, in turn, to foster positive cyberspace culture and achieve the

QNV 2030. The current research further validates the proposed cyberspace culture framework through the collection of empirical data (a focus group discussion) and a review of previous literature. Through the validation process, this framework was refined by modifying the bi-directional relationships between the external elements and the achievement of the Vision 2030 into a uni-directional alternative. Therefore, the first recommendation concerns an increased focus on the validated cyberspace culture framework by stakeholders involved in fostering cyberspace culture (government and higher education institutions) in order to leverage the framework to achieve targeted strategic objectives.

Continuing, this research advocates for different stakeholders to adopt implementation guidance associated with the proposed cyberspace culture framework. Therefore, the second recommendation is for stakeholders to not only focus on the validated cyberspace culture framework, but also to adhere to the implementation guidance it proposes. The government, for instance, is recommended to take a leading role in guiding the development of cyberspace culture through funding higher education institutions, facilitating collaboration with international stakeholders, and passing regulations that promote fairness and the use of technology. Leadership in higher education institutions should also focus on being accountable and avoid implementing risk-generating strategies.

However, this research has also revealed that the adoption of cyberspace for educational advancement remains challenged by negative aspects such as cybercrime, cyberbullying, and cyber espionage. This suggests that, even as higher education institutions seek to adopt cyberspace to achieve their strategic objectives as well as Vision 2030, there remains a further need to invest in security best practices in order to ensure that the institutions' resources and actors in cyberspace remain protected from the increased threats. As such, the third recommendation emphasises the role of security preparedness for higher education institutions before migrating all their educational and managerial activities to cyberspace.

8.8 Recommendation for Future Research

Despite this research proposing and validating a cyberspace culture framework to align cyberspace culture with strategic objectives, future scholars should build on the current framework and test its components in real-world settings. This will subsequently ensure that the framework is evaluated

in terms of its effectiveness in aligning cyberspace culture and strategic objectives in higher education. Additionally, future scholars should subsequently test the proposed cyberspace culture framework in different higher education settings, such as universities, colleges, and tertiary institutions, in order to assess its effectiveness in facilitating the achievement of the higher education 2030 vision and to identify aspects that can be improved further.

Continuing, the review of the literature revealed a dearth of studies on cyberspace culture in the context of Qatar higher education. This suggests a need for future researchers to also focus more keenly on this topic in Qatar given the government's increased investment in higher education and adoption of a knowledge-based economy. Furthermore, the majority of studies that were examined indicate that considerable attention has been directed towards cyberspace and its application in higher education in the Western world while minimal studies have been undertaken in Gulf countries. This also highlights the need for researchers to further investigate cyberspace culture in Qatar's higher education sector.

A third avenue for future research is to investigate other additional factors that influence the achievement of the higher education 2030 vision in Qatar in order to enhance the proposed cyberspace culture framework. Despite the framework's effectiveness in aligning the strategic objectives of higher education with cyberspace culture, the Researcher acknowledges that other potential improvements can be made to the framework, specifically regarding the influence of contextual background factors that affect the use of cyberspace culture in higher education. Therefore, a further need exists to examine the socio-cultural factors that influence the adoption of cyberspace culture and its alignment with the strategic objectives developed.

8.9 Research Conclusion

The main conclusion from this research is that the Qatar higher education 2030 vision can be achieved by strategically conceptualising cyberspace culture and adopting the proposed cyberspace culture framework in order to align cyberspace culture with the targeted strategic directions. In this research, it emerged that existent cyberspace culture frameworks remain ineffective in aligning cyberspace culture with the strategic objectives in organisations due to their lack of consideration for the impact of human factors. Moreover, research concerning the alignment of cyberspace culture and the attainment of the higher education 2030 vision remains

scarce. This research thus bridges this gap by proposing the cyberspace culture framework (Figure 4-7), comprised of three strategic elements: a) external elements representing the government's Vision 2030 directives, b) internal elements representing higher education leadership, and c) the culture of organisations. This research further identifies two main stakeholders involved in the development of Qatar's cyberspace culture in higher education: a) The government, which plays multiple roles as a supervisory authority, a funding organisation, and a regulator; and b) higher educational leadership, which is involved in crafting strategies that ensure institutions achieve targeted strategic objectives. However, input from other external stakeholders such as international collaborators, scientists, and pioneering technology companies is also acknowledged. An ecosystem comprising stakeholders and resources is thus identified as highly important for fostering cyberspace culture and ensuring that cyberspace is utilised to facilitate attaining strategic objectives.

Additionally, this research posits that the achievement of the higher education 2030 vision fits into the attainment of the larger and more comprehensive QNV 2030, which seeks to transform Qatar from a hydrocarbon-based economy into one that is knowledge-based using its four pillars—namely, economic, environmental, human, and social development. This assertion arises from the fact that reliance on cyberspace culture to facilitate achieving the higher education vision is anticipated to lead to increased dependence on cyberspace for advancing other strategic objectives in other sectors of the economy, such as business. As a result, the majority of the population will leverage cyberspace to achieve their strategic objectives in sectors such as business and service industries.

In conclusion, this research argues that the proposed cyberspace culture framework is universal in its application, as it can be adopted across different sectors to ensure that cyberspace culture aligns with the achievement of strategic objectives. This research accordingly advocates for the framework's use in aligning cyberspace culture with strategic objectives, thereby leveraging cyberspace to advance economies

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Appendix A: Interview Questions

1. **What influence do you think the vision 2030's directive of strategy formulation exerts on the attainment of the higher education vision 2030? Does the attainment of the higher education vision 2030 lead to a better and effective cyberspace culture?**

    Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Economic	Leadership strategies to increase the economic viability of higher education institutions. E.g. creating more courses and expanding institutions.					
External leadership pressure to implement certain strategies.	Leadership pressure by the education ministry for higher education institutions to adhere to select strategies. For instance, implement online learning.					
Other, please specify						

The question investigates the participant's understanding on the influence government leadership on the fostering of cyberspace culture in higher education in terms of strategy formulation. The question identifies different types of strategies that the government uses to foster cyberspace culture.

2. **Please describe the influence of vision 2030 directive (information security policy and regulation) on the attainment of the higher education vision 2030? the fostering of cyberspace culture in higher education? In what ways does this influence lead to a better and effective cyberspace culture?**

Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Compliance and Advanced Security	Some security policies may require institutions to comply by adopting new security management strategies. For instance, compliance to ISO in an effort to enhance their security. The compliance is likely to influence the creation of new security culture.					
Environmental uncertainty	Uncertainty in the higher education environment can arise where government regulations are expected to change with new leadership.					
Political factors	Politics in the government can force higher education institutions to adopt new strategies, such as advocate, for new management boards, thereby affecting culture.					

Other, please specify	

The question investigates the participant's understanding regarding the influence of government policy of information security on the fostering of cyberspace culture in higher education. It identifies some existent policies that are already being implemented in the given space and other possible alternatives that may be implemented.

3. **Advanced technology transforms higher education in different ways. Please describe the influence of advancement in technologies on the attainment of the higher education vision 2030?**
   Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Learning and teaching	Describes new innovations on e-learning to share knowledge, improve collaboration, and enhance flexibility of learning. Similarly, technology transforms teaching leading to flipped classrooms and higher reliance on technology for teaching.					
Management of learning institutions	Refers to the use of technology to gain new insights on management of higher education institutions; for instance, analytics in decision making. Cyber					

	management is further required to ensure technology is used appropriately.				
Other, please specify					

The question investigates the participant's understanding regarding the influence of advanced technology on the attainment of the higher education vision 2030. As such, it seeks to identify how the participants link the role of technology in the attainment of the higher education vision 2030.

4. **Please describe whether the influence of the attainment of the higher education vision 2030 leads to a better and effective cyberspace culture?**

   Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Learning and teaching	Describes new innovations on e-learning to share knowledge, improve collaboration, and enhance flexibility of learning. Similarly, technology transforms teaching leading to flipped classrooms and higher reliance on technology for teaching.					

Management of learning institutions	Refers to the use of technology to gain new insights on management of learning institutions, for instance, analytics in decision making. Cyber management is further required to ensure technology is used appropriately.					
Other, please specify						

The question investigates the participant's understanding regarding the influence of advancement in technology on the fostering of cyberspace culture in higher education. It identifies some strategies that are already being implemented in the given space

5. **Qatar's vision 2030 emphasizes on human development in terms of education advancement and social growth. Please describe whether the attainment of the higher education vision 2030 lead to a better and effective cyberspace culture? Please rate one of the following.**

Factor	Description	Very Important	Important	Average	Less Important	Not Important
The proposed implementation framework of vision	The framework proposes various objectives that are needed to be achieved in order to enhance education by 2030. These objectives					

| 2030 in education development. | and activities are expected to influence the higher education vision 2030. | | | | | |
| Other, please specify | | | | | | |

The question investigates the participant's perceptions on whether attaining the higher education vision 2030 influences the cultivation of effective cyberspace culture. The assumption held is that since the vision 2030 framework leads to the attainment of the higher education vision, there is a necessity to assess whether achieving the higher education vision 2030 influences the cultivation of positive cyberspace culture.

6. **Please describe the influence of the internal leadership strategy adopted in a higher education institution on the attainment of the higher education vision 2030? Does the attainment of the higher education vision 2030 lead to a better and effective cyberspace culture?**

   Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Accountability of leadership towards the fostering of positive cyberspace culture	Describes the liability or answerability of leaders towards ensuring positive cyberspace culture					
Risk management	Describes the leadership's role in identifying and eliminating risks that					

	challenge the cultivation of positive cyberspace culture.					
Other, please specify						

The question seeks to investigate the participant's understanding on the impact of the leadership strategy in a higher learning institution on the fostering of cyberspace culture in higher education.

7. **Please describe the influence of security, technical and best practices adopted in a higher education institution, on the attainment of the higher education vision 2030? Does the attainment of the higher education vision 2030 lead to a better and effective cyberspace culture?**

   Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Security skills and knowledge to prevent threats and risk.	Describes security know-how that may not be directly observable.					
Other, please specify						

The question seeks to establish the participant's understanding on the impact of security best practices adopted in a higher learning institution on the fostering of cyberspace culture in higher education.

8. **Please describe the influence of the internal security policies implemented in a higher education institution, on the attainment of the higher education vision 2030? Does the attainment of the higher education vision 2030 lead to a better and effective cyberspace culture?**

   Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Attitudes and behaviour	Describes the security attitudes and behaviour of employees in the institution.					
Continuous learning	Describes the willingness of users to continue enhancing their knowledge and skills on security aspects.					
Security Awareness	Describes the awareness of users regarding need for securing the data and resources within the institution.					
Other, please specify						

The question investigates the participant's understanding of the influence of internal security policy factors on the attainment of the higher education vision 2030. As a result, it links the attainment of the vision to the cultivation of cyberspace culture.

9. **Please describe the influence of culture in the fostering of cyberspace culture and the attainment of vision 2030 in higher education**
    Please rate one of the following in your response.

Factor	Description	Very Important	Important	Average	Less Important	Not Important
Visible processes	Includes language, visible traditions such as leadership practices and social rituals in the firm.					
Attitudes and behaviour	Describes the behaviour and attitudes of employees that are unique to the organisation					
Values developed	The ideals and beliefs that guide the employees					
Cultural dimensions	Describes high level culture in terms of how it influences the inherent behaviour of individuals.					
Other, please specify						

The question examines the impact of theoretical levels of culture on the fostering of cyberspace culture. The insight is highly important, as it indicates the impact of theory on the real-world.

FOCUS GROUP

10. Based on your observation, do you think that the proposed framework (internal and external elements as well as theoretical perspectives) can align cyberspace culture to the higher education vision? Does the attainment of the vision affect how cyberspace culture is fostered?

- Which aspects of the framework do you think exert higher influence on the development of cyberspace culture?
- Which reservations do you have regarding the framework and its role in aligning cyberspace culture to the higher education vision?
- Any additional comments?

The last question investigates the effectiveness of the proposed cyberspace culture framework on the alignment to the higher education vision. The effect of attaining the higher education vision on cyberspace culture is additionally evaluated in order to assess the bi-directional relationship. Two focus groups will be organised in order to discuss the bi-directional relationship between the proposed framework and alignment of the higher education vision. Each focus group comprises of 5 participants drawn from different departments in higher education and the Qatar vision 2030. The researcher will conduct the focus group sessions differently in order to compare the findings.

Appendix B: Interview Particulars

Table 6-3: Particulars of the interviews.

No.	Respondent code	Duration	Words	Interview setting	Interview category	Organisation section	Interviewee roles	Interviewee experience	Gender	Nationality	Job categories
1	Respondent 1	29:27	3019	In person	Strategy	Higher Education	Dean	3 years	Male	Qatari	Academic
2	Respondent 2	42:34	4492	In person	Strategy	Higher Education	VP	5 years	Male	Qatari	Academic
3	Respondent 3	46:39	6632	In person	Technical	Higher Education	Manager	8 years	Male	Non-Qatari	Non-academic
4	Respondent 4	49:30	3392	In person	Strategy	Higher Education	VP	5 years	Male	Qatari	Academic
5	Respondent 5	25:48	3939	In person	Strategy	Higher Education	Director	8 years	Male	Qatari	Academic
6	Respondent 6	31:00	4646	In person	Strategy	Higher Education	Associate Vice President	5 years	Male	Non-Qatari	Academic
7	Respondent 7	20:04	2736	In person	Strategy	Regulatory Sector	Undersecretary	3 years	Male	Qatari	Academic
8	Respondent 8	22:18	2792	In person	Technical	Higher Education	Director	3 years	Female	Qatari	Academic

9	Respondent 9	30:40	3908	Online call	Technical	Regulatory Sector	Manager	7 years	Male	Non-Qatari	Non-Academic
10	Respondent 10	19:00	1895	Online call	Technical	Regulatory Sector	Manager	2 years	Female	Qatari	Non-academic
11	Respondent 11	28:51	2659	Online call	Strategy	Higher Education	President	5 years	Male	Qatari	Academic
12	Respondent 12	17:30	2303	Online call	Technical	Regulatory Sector	Section Head	4 years	Female	Qatari	Non-academic
13	Respondent 13	27:59	3633	Online call	Strategy	Higher Education	Teaching Assistant	3 years	Female	Qatari	Academic
14	Respondent 14	44:21	6009	Online call	Strategy	Higher Education	Director	4 years	Male	Qatari	Academic
15	Respondent 15	43:47	6587	Online call	Strategy	Higher Education	Director	6 years	Male	Non-Qatari	Non-academic
16	Respondent 16	25:05	3154	Online call	Technical	Regulatory Sector	Section Head	8 years	Male	Non-Qatari	Non-academic
17	Respondent 17	17:48	2358	Online call	Technical	Higher Education	Director	3 years	Male	Non-Qatari	Academic
18	Respondent 18	10:27	1425	Online call	Technical	Higher Education	Associate Vice President	3 years	Male	Qatari	Non-academic

Total 18 Interviews	Duration: 532.48 min
	[8 hrs, 14 min, 58 sec]
	Total words: 65,579
	10 online calls, eight face-to-face interviews

Source: The Researcher

Appendix C: Focus Group Particulars

Table 6-2: Particulars of the focus group

No.	Respondent code	Interview setting	Professional category	Organisational sector	Professional roles	Professional experience	Gender	Nationality	Job categories
.1	Respondent 1	In person Face to Face	Technical	Regulatory Sector	Section Head	8 years	Male	Non-Qatari	Non-academic
.2	Respondent 2	In person Face to Face	Technical	Higher Education	Manager	6 years	Male	Non-Qatari	Non-academic
.3	Respondent 3	In person Face to Face	Technical	Higher Education	Director	5 years	Male	Qatari	Non-academic
.4	Respondent 4	In person Face to Face	Strategy	Higher Education	Manager	1 years	Male	Qatari	Academic
.5	Respondent 5	In person Face to Face	Strategy	Regulatory Sector	Director	5 years	Female	Qatari	Non-academic
.6	Respondent 6	In person Face to Face	Strategy	Higher Education	Associate Vice President	2 years	Male	Qatari	Academic

Source: The Researcher

Appendix D: Themes and Coding References

Table 6-3 Number of coding references and items coded per theme

Theme	Sub-theme	Main code	Code	Number of coded items
External elements (Sub-Section 4.7.2)	Role of the QNV 2030 directive (Sub-Section 4.7.2.3)	Leadership (Sub-Section 4.7.2.1.1)	Economic factors (Sub-Section 4.7.2.1.1.1)	13
			External pressure (Sub-Section 4.7.2.1.1.2)	16
		Information security policy and regulation (Sub-Section 4.7.2.1.2)	Compliance and advanced security (Sub-Section 4.7.2.1.2.1)	4
			Environmental uncertainty (Sub-Section 4.7.2.1.2.2)	12
			Political factors (Sub-Section 4.7.2.1.2.3)	10
	Role of technological advancement (Sub-Section 4.7.2.2)	Technological advancement (Sub-Section 4.7.2.2)	Learning, teaching (Sub-Section 4.7.2.2.1)	9
			Management (Sub-Section 4.7.2.2.2)	4
	Role of the QNV 2030 (Sub-Section 4.7.2.3)	The QNV 2030 framework (Sub-Section 4.7.2.3.1)	Implementation framework (Sub-Section 4.7.2.3.1)	17
Internal elements (Sub-Section 4.7.1)		Leadership and management strategies (Sub-Section 4.7.1.1)	Accountability (Sub-Section 4.7.1.1.1)	5
			Risk management (Sub-Section 4.7.1.1.2)	1
		Security policy (Sub-Section 4.7.1.2)	Security awareness (Sub-Section 4.7.1.2.1)	3
			Continuous learning (Sub-Section 4.7.1.2.2)	8
			Attitudes and behaviour	1

			(Sub-Section 4.7.1.2.3)	
		Security technical and best practices (Sub-Section 4.7.1.3)	Security skills and knowledge (Sub-Section 4.7.1.3.1)	1
Role of culture (Sub-Section 4.7.3)		Dimensions of culture (Sub-Section 4.7.3.2)	Culture dimensions (Sub-Section 4.7.3.2)	1
		Levels of culture (Sub-Section 4.7.3.1)	Values Visible processes Attitudes and behaviour (Section 4.7.3.1)	

Source: The Researcher