THE IMPACT OF ENTERPRISE SOCIAL NETWORKING ON KNOWLEDGE SHARING BETWEEN ACADEMIC STAFF IN HIGHER EDUCATION

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Doctor of Philosophy

By

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Abstract

Higher education institutions have always considered knowledge sharing critical for research excellence and finding proper methods for sharing knowledge across academic staff has therefore been a major issue for universities and knowledge management research. Recent evidence shows that many universities have embraced enterprise social networking tools to improve communication, relationships, partnerships, and knowledge sharing. To date, there is little understanding of the critical factors for online knowledge sharing behaviour between academic staff, and the impact of these factors on work benefits for academic staff which differ between consumptive users and contributive users in higher education. This study employed the extended unified theory of acceptance and use of technology (UTAUT) to examine factors affecting knowledge sharing about the consumptive use and contributive use of enterprise social network (ESN) behaviour. The study adopts a critical realism philosophical approach and employed a grounded theory mixed methods. The conceptual model was validated through structural equation modelling based on an online survey of 254 academic staff using enterprise social networking as a part of their work in the United Kingdom. The findings have significant theoretical and practical implications for researchers and policy makers. The research has developed a cohesive ESN use model by extending and modifying the unified theory of acceptance and use of technology. The findings indicate significant differences around factors affecting consumptive and contributive usage patterns within ESNs. Due to advances in communication technologies, this research argues that a previous model suggested by Venkatesh et al. (2003) is no longer fit for purpose and the new communication tools can lead to improved knowledge in higher education. This research also makes valuable contributions to universities from a managerial viewpoint, suggesting that universities could help their scholars find a more comprehensive range of funding sources matching scholars' ideas.

Statement of Originality

I, Shakiba Kazemian, declare that the ideas, research work, analyses and conclusions reported in my PhD thesis "The Impact of Enterprise Social Networking on Knowledge Sharing between Academic Staff in Higher Education" are entirely my effort, except where otherwise acknowledged. Also, I declare that this thesis includes no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma.

Shakiba Kazemian

May 2023

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Publications Generated from This Study

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List of Abbreviations

AGFI	Adjusted Goodness of Fit
α	Alpha Coefficient (Initialism)
ANOVA	Analaysis of Variance
AMOS	Analysis of Moment Structures
ASIS&T	Association for Information Science and Technology
AVE	Average Variance Extracted
BREO	Brunel Research Ethics Online
C-TAM-TPB	Combination Technology Acceptance Model and Theory of Planned Behaviour
$\chi 2$	Chi-square
CFI	Comparative Fit Index
CFA	Confirmatory Factor Analysis
CR	Critical Ratio
DTPB	Decomposed Theory of Planned Behaviour
df	Degrees of freedom
EOU	Ease of Use
ESP	English for Specific Purpose
ESN	Enterprise Social Network
EFA	Exploratory Factor Analysis
GOF	Goodness of Fit Index
GFI	Goodness of Fit Index
HEI	Higher Education Institutions
IS	Information System
IT	Information Technology
IDT	Innovation Diffusion Theory
IM	Instant Messaging
IBM	International Business Machines Corporation
KMO	Kaiser's Criterion
KM	Knowledge Management
KMS	Knowledge Management System
MLE	Maximum Likelihood Estimation
MM-GT	Mixed-Method Grounded Theory
MPCU	Model of Personal Computer Utilisation
MM	Motivational Model
NNFI	Non-Normalised Fit Index

NFI	Normalised Fit Index
PNFI	Parsimony Normed Fit Index
PEOU	Perceived Ease of Use
PSNS	Public Social Network Site
RQ	Research Question
RMSE	Root Mean Square Error
RMSEA	Root Mean Square Error of Approximation
RMR	Root Mean Square Residual
SCT	Social Cognitive Theory
SNS	Social Network Site
λ	Standardised Factor Loading (Initialism)
SE	Standard Errors
β	Standardized Regression Weight
SPSS	Statistical Packages for Social Science
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
SRAVE	The Square Root of Average Variance Extracted
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
t	Tolerance (Initialism)
TLI	Tucker-Lewis Index
UTAUT	Unified Theory of Acceptance and Use of Technology
UK	United Kingdom
VIE	Valance Instrument and Expectancy
VIF	Variance Inflation Factor

Chapter One: Introduction

Chapter One: Introduction

1.1 Introduction

Knowledge management (KM) has become a major issue in academic setting and non-academic settings. Online knowledge sharing is crucial for creating and maintaining competitive advantage in organisations. Online knowledge sharing also takes a leading role in improving organisational competency by allowing staff to share and trade knowledge, simplify knowledge attainment, and spread knowledge within an organisation (Mirzaee and Ghaffari, 2018).

Chapter One broadly assesses online knowledge sharing between academic staff in higher education. This chapter identifies the research gaps from the theoretical perspective and the critical factors in the knowledge-sharing process in the higher education context from a practical standpoint. The research aims, objectives, research questions and methods are then discussed. Finally, the original contribution and significance of the research are outlined.

1.2 Research Background

The value of knowledge as a tactical resource to any organisation is becoming progressively accepted with a rising awareness that nations and organisations have become more information and knowledge intensive (Chedid, Alvelos and Teixeira, 2022; Grant, 2016; Cleveland, 2016; Fullwood, Rowley and Delbridge, 2013; Tohidinia and Mosakhani, 2010; Lin, 2007). Continual KM plays a critical role in an organisation's achievement (Aboelmaged, 2018) and encourages organisational growth (Tohidinia and Mosakhani, 2010). Moreover, employees play a crucial role in an organisation, and employees with knowledge are beneficial to organisations (i.e., experience and skills), as they know more than the data accumulated in the

organisation's information systems (Blair, 2002). The benefits achieved by organisations vary mainly in the power of forming and sharing knowledge (Nahapiet and Ghoshal, 1998, cited in Chedid, Alvelos and Teixeira, 2022, p.1). Within the last decade, many studies have examined factors influencing individual attitudes toward knowledge sharing (Kim and Ju, 2008), including social, individual, technological, and organisational aspects (Chedid, Alvelos and Teixeira, 2022; Tohidinia and Mosakhani, 2010; Lin, 2007).

Higher education institutions (HEIs), such as public universities, have always considered knowledge exchange crucial to research excellence (Howell and Annansingh, 2013). Therefore, finding suitable methods for sharing knowledge across academic staff has been an important issue for both universities (Fullwood, Rowley and Delbridge, 2013). Existing studies show that knowledge sharing does not appear strongly within HEIs (Ramayah, Yeap and Ignatius, 2013; Chedid, Alvelos and Teixeira, 2022). Several higher learning organisations have received grants to implement KM practices (Sohail and Daud, 2009). The management of organisational knowledge and the support of academic staff knowledge sharing is neglected in HEIs with there being a minimal amount of KM execution and knowledge sharing manifested in these associations (Fullwood, Rowley and Delbridge, 2013; Fullwood and Rowley, 2017). Furthermore, valuable unstructured knowledge from experiences, insights, and staff ideas, known as “tacit knowledge”, is often not clearly part of the knowledge-sharing process (Cleveland, 2016; Lai and Chen, 2014; Fullwood, Rowley and Delbridge, 2013).

With the growth of social media tools and the success of public social networking sites (PSNSs) such as LinkedIn, Facebook and Twitter, previous research has identified new opportunities that these technologies may offer that allow both formal and informal knowledge exchange (Nguyen et al., 2019; Alshahrani and Pennington, 2018; Chin, Evans and Choo, 2015; Panahi, Watson and Partridge, 2016 a , 2016 b). There have been extensive studies focusing on the

acceptance and consequent usage of these PSNSs both by individuals and organisations in information systems literature (Al-Busaidi and Olfman, 2017; Wehner, Ritter and Leist, 2017; Kane et al., 2014; Moqbel, Nevo and Kock, 2013; Wilson et al., 2012).

Several studies have described the positive consequences of integrating social media sites into higher education. Many such pieces of research have targeted students (Dyson et al., 2015; Hamid et al., 2015; Uusiautti and Määttä, 2014; Hung and Yuen, 2010). Other studies have targeted academic staff (Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Arshad and Akram, 2018; Dermentzi et al., 2016; Donelan, 2016; Manca and Ranieri, 2016; Al-Aufi and Fulton, 2014; Gruzd, Staves and Wilk, 2012; Gu and Widén-Wulff, 2011). The latest evidence (e.g., Maican et al., 2019; Arshad and Akram, 2018; Dermentzi et al., 2016; Donelan, 2016; Ortbach and Recker, 2014) shows that many universities have recently incorporated enterprise social networks (ESNs) such as Microsoft Yammer for enhanced communication, relationships, partnerships, and improved knowledge distribution and sharing. However, the expected benefits of ESNs had not been completely understood due to the comparatively low usage of such networks among faculties and academic staff (Maican et al., 2019).

Further, the majority of ESN users are consumptive users, who just read the knowledge shared without contributing themselves. The prevalence of consumptive users not only affects posting rates, but also the generated content quality (Amichai-Hamburger et al., 2016; Sun et al., 2014). The low participation among online communities presents a challenge, as these communities' sustainability depends on participants' contributions (Amichai-Hamburger et al., 2016). Consequently, online communities may become less informative and even boring for both consumptive and contributive participants (Amichai-Hamburger et al., 2016). Since the vast majority of online communities consist of consumptive users, an organisation could motivate consumptive users to share knowledge and contribute to organisational intellectual capability

(Amichai-Hamburger et al., 2016). Encouraging more people in a discussion also leads to developing common ground amongst users (Zhao and Rosson, 2009), arousing more thoughts (Amichai-Hamburger et al., 2016).

Another value of engaging consumptive users in sharing knowledge, is the value of the knowledge shared. Academic staff in HEIs play a significant role in creating and reiterating their knowledge and intellectual property through research (Fullwood and Rowley, 2017). Consumptive users can contribute to the success of their organisations by increasing their contributive use of ESN platforms. Such contributive use increases knowledge sharing, enables value creation and leads to better performance and further development of the organisation (Amichai-Hamburger et al., 2016). Therefore, it is beneficial to examine consumptive users and encourage them to share knowledge.

Currently, there is little understanding of the key predictors of online knowledge-sharing behaviour in higher education among academic staff. The impact of these factors on outcomes differs between consumptive users and contributive users in the United Kingdom (UK) in the online knowledge-sharing literature. Rather than examining the driving forces of consumptive users, previous studies typically investigate undifferentiated overall members or contributive users who share knowledge (Dermentzi et al., 2016; Gruzd, Staves and Wilk, 2012). Academic staff may adopt ESNs for feeding (consuming) information and knowledge. Consumptive users may ask questions about work-related problems, read news feeds, search, and download files. Contributive users may use ESNs to donate information and knowledge such as responding to other academic staff enquiries, posting a post, or uploading a file (Mäntymäki and Riemer 2016; Kügler et al., 2015).

1.3 Motivation for the Research Problem

1.3.1 The Prevalence of Knowledge Holding among Academic Staff

As discussed above the ability of an organisation to achieve a competitive advantage and be commercially successful is strongly affected by knowledge management. Knowledge management aims to improve new knowledge and the ability to innovate, along with existing knowledge, networking, and recycling. Universities perform in an environment characterised by intense competition and financial pressure. Through research and education, university faculty members contribute significantly to developing and utilising their knowledge and creative capital (Kim and Ju, 2008). As a result, the success of universities has always depended on academic staff exchanging their knowledge, expertise, and resources.

The effectiveness of a university's mission and purpose depends heavily on its academic staff (Stankovska et al., 2017). Stankovska et al. defined academic staff as staff whose main responsibility is to carry out research or take part in public service (e.g., assisting in recruitment of students and initiatives designed to help students succeed academically). These are crucial resources for educational programmers to succeed (Stankovska et al., 2017). Academic staff members are highly competitive and often complain about rules and restrictions (Santos, Varela and Kerridge, 2021). They associate more closely with their colleagues who are engaged in similar research than with individuals from other disciplines or with the entire university (Ridzuan and Sam, 2008).

According to Cheng, Ho and Lau (2009), knowledge holding is a typical behavior among academic staff. Kim and Ju (2008) believed that the lack of procedures and regulations to secure staff knowledge properties might be attributed to their reluctance to share information. Fullwood, Rowley and Delbridge (2013) summarised the factors attributed to academic staff

unwillingness to exchange information as the independent nature of academia and research, academic departments' complexity (Lee, 2007), and commitment to the discipline of performing science rather than how the aims and objectives of the organisation (Cronin, 2001; Ramayah, Yeap and Ignatius, 2013).

Academic staff desire to intentionally restrict the exchanging of their knowledge, particularly when they hold valuable expertise that others do not. Individuals are unwilling to exchange tacit knowledge because they see it as a precious resource that cannot be given away freely, driven mainly by instinct for self-preservation (Ramayah, Yeap and Ignatius, 2013). Szulanski (1996) added additional causes for a person's reluctance to share knowledge, the belief that one will not be sufficiently rewarded for sharing knowledge, and a lack of resources and time on the part of the individual to carry out such a transfer.

Many academic staff are unaware that practical academic cooperation among faculty members would boost rather than reduce their efficiency and develop organisational skills essential for universities' performance. Academics typically offer their knowledge in the following manner: 1) through written contributions like books or academic papers; 2) through formal interactions with other team members during conferences and seminars; 3) through informal interactions; and 4) through knowledge sharing within social media (Bartol and Srivastava 2002).

Many studies on academic staff have been carried out to identify the variables influencing the quality of research (e.g., Bonaccorsi, Belingheri and Secondi, 2021; Browning, Thompson and Dawson, 2017; Edgar and Geare, 2013). There is broad agreement that factors at the individual and institutional levels influence research productivity. The research environment (research team, department, or university) and the external environment are referred to as institutional-level factors (social and economic environment at regional and country levels). Browning, Thompson and Dawson (2017) suggested that factors at the individual level influencing the

research productivity contains input and output indicators. The importance of research funding earned, doctoral student supervision, collaborating with peers to develop ideas and innovations, and paper review are all elements of input measures (Browning, Thompson and Dawson, 2017).

A country like the UK, which has high enrolment levels, is classified as a "dynamic leader". The overall research performance of a university and its academic staff as regards creating and carrying out suitable research management plans, will determine the results of funding competitions (Edgar and Geare, 2013). The success of academic staff in obtaining research grants depends on:

a) the university's ability to develop and implement appropriate research management plans (Edgar and Geare, 2013),
b) the university's ability to identify and educate high profile researchers (Edgar and Geare, 2013),
c) the ability of academic staff at the university to plan projects competing for funding opportunities (Edgar and Geare, 2013).

Research administrators may be associated with executive department engaged in research, consultancy, and entrepreneurships or with academia such faculties (Santos, Varela and Kerridge, 2021). Santos, Varela, and Kerridge (2021) said that research administrators, who can vary in power from administrative assistants to vice presidents of research, supervise, maintain, cooperate with, review, and monitor funded programs. They manage, maintain, comply with, review, and monitor sponsored programs (Kerridge and Scott, 2018).

A research and development department are essential environments for interaction between academic staff and improves not only knowledge, competency, and skillsets, but also fosters standards, values and behaviours related to academic career paths.

In addition to undertaking research, academic staff have teaching commitments. Academic staff teach a wide range of subjects, and the time required to organise and write courses, as well as the high-level of staff-student contact, are all constraints on the quality of research. Deem (2010) offered four suggestions for improving the bond between academics and research administrators in order to secure research opportunities.

a) Research administrators are extremely helpful when research funding becomes scarce. They guide academic staff in finding a wider variety of funding sources, matching the ideas of scholars to the requirements of various funders. Since academic staff are unfamiliar with bid development to place discrepancies, inconsistencies, dismissal from the topic or focus, and other issues, research administrators help academic staff as essential peers in reading through draft bids.
b) A knowledgeable and skilled administrator can recommend potential participants for a large-scale interdisciplinary research program, convince them to participate, arrange meetings and due dates, ensure a funding call's conditions are met, review drafts of outline bids, and help with issues such as ethics approval and research leadership.
c) Since research is having more influence outside academia, at least in the UK, the support of an excellent research administrator team can help track influence, increase public commitment, and enable information sharing.
d) Administrators and academic staff could create their own quantitative and qualitative success metrics.

Academic departments and organisations will have a better future if academic staff and administrators work together to continue successfully increasing research funding. This will also strengthen collaboration between academic staff and research administrators. Bringing back to the point made by Kim and Ju (2008), faculty members must share their expertise. HEIs have sought to use several techniques, like knowledge management system (KMS) and particular interest group research, to motivate academics to share information (Rahman et al., 2016).

1.3.2 The Importance of Social Media in Higher Education

Social media is used at every stage of the research phase, from discovering future research to communicating research findings (Aldahdouh, Nokelainen and Korhonen, 2020). Before the emergence of ESNs, the most common tool in 2011 were those that facilitated collaborative publishing, videoconferencing, organising and gathering (Rowlands et al., 2011). Social media may provide an informal information flow comparable to, and in some cases better than, the methods of communicating usually followed by academics for distribution and collaboration purposes – face-to-face interactions with peers, lectures and workshops (Aldahdouh, Nokelainen and Korhonen, 2020). Gruzd, Staves and Wilk (2012) found that the use of social media tool by scholars creates an informal knowledge-sharing environment, which leads to building friendships and improving personal perceptions. There is a lack of research in the area of ESN usage in higher education (Dermentzi etal, 2016; Al-Aufi and Fulton, 2014). Therefore, this research was interested in how ESNs could facilitate the increase of knowledge sharing in an academic community via the use of ESNs.

With the emergence of ESNs, many firms employed them as a component of their organisational knowledge management strategy and as an innovative way of connecting knowledge seekers with relevant content and individuals (Qi and Chau, 2018). In recent years,

universities have encouraged users to take up the new opportunities that ESNs may afford for formal and informal knowledge sharing. Aboelmaged. (2018) added that ESNs might have other advantages for collaborative work, including being practical in terms of time, cost-effectiveness, personalisation and being cloud-based. Mäntymäki and Riemer (2016) found that using ESNs adds value in terms of developing common ground, problem solving and managing tasks, updating events, and simultaneously allowing individuals to achieve social and professional goals. Maican et al. (2019) found that scholars used ESNs to contribute to, and acquire, information about upcoming research activities. These interactions were found to allow users to build friendships with other colleagues within the university, and that universities help to promote increasing quantities of workshops, mentoring programmes and other initiatives designed to promote and enhance academic grantsmanship, universal publications and showcasing of events.

Academic staff generally become involved in an activity when they expect to gain benefits such as increased pay, bonuses and/or career advancement (Abreu and Grinevich, 2013). In knowledge-sharing activities in research, scholars return something in exchange for ideas, energy and cost. Researchers regularly share knowledge with other researchers via social media (e.g., LinkedIn, ResearchGate and Twitter) to refine their ideas or to help others to find information (Alshahrani and Pennington, 2018; Panahi, Watson and Partridge, 2016 a, 2016 b; Fullwood, Rowley and Delbridge, 2013; Gruzd, Staves and Wilk, 2012). Alshahrani and Pennington (2018) added that scholars employ social media as a channel for apparently introducing themselves and their output (e.g., publications) to those who share the same interests.

Adopting and employing ESNs has become more integrated in a scholar's daily life (Alshahrani and Pennington, 2018). On the other hand, the literature (Gruzd, Staves and Wilk, 2012;

Fullwood, Rowley and Delbridge, 2013) indicates that time constraints, a feeling of being overloaded with information, and a lack of technical and organisational support inhibit scholars from using social media as part of their work. These barriers have led academic staff to make limited use of these organisational networks.

Maican et al. (2019), however, found that academic staff still use email as their primary communication and collaboration tool in both teaching and research, especially in developing nations such as Romania. A few recent studies such as Arshad and Akram (2018) found that the perceived ease of use and usefulness effects positively on the use of Microsoft Yammer among academic staff in two different countries, Pakistan, and the Kingdom of Saudi Arabia. Donelan (2016) reached similar conclusions that the use of social media could boost academic staff career progression and enhance network opportunities in the UK.

Therefore, as so few studies have been conducted all over the world regarding the use of social media by academic staff and its impact on their work performance in universities, there is a need for research to investigate the factors influencing the use of ESN between academic staff in higher education. More importantly, ESNs become a distinctive online community for scholars to share knowledge and communicate. The use of email and PSNSs among academic staff has faded away for teaching and research in developed countries such as the UK, and tools such as Microsoft Yammer, Microsoft Teams and Zoom could replace the much older tools.

1.4 Research Aims and Research Questions

1.4.1 Research Aims

The research seeks to explore the impact of ESNs on communication and research opportunities among academic staff in higher education. This research also aims to develop a cohesive ESN

use model by modifying and extending the Unified Theory of Acceptance and Use of Technology (UTAUT).

1.4.2 Research Objectives

In order to address the aims of this research adequately, the research will consider the following objectives:

I. To develop a proposed conceptual framework based on the previous literature review and findings from case studies (e.g., web posts, a focus group) to measure factors influencing ESN use among consumptive users and contributive users within higher education.
II. To identify the main advantages of ESN use among academic staff in higher education based on their emerging knowledge and information practices.
III. To validate the proposed model and hypotheses empirically by conducting a quantitative survey within higher education in the UK.
IV. To determine the effect of gender, age and academic position on ESN usage among academic staff within higher education.
V. To investigate the differences that age, gender, and years of experience play on realising the benefits of ESN usage.

1.4.3 Research Questions

Current research on the impact of KM and its relationships does not take advantage of the benefits of integrating ESNs for academic staff use within higher education toward better organisational competitiveness. Some studies have examined the positive effects of integrating ESNs and PSNSs for academic staff use in higher education (Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Arshad and Akram, 2018; Dermentzi et al., 2016; Donelan, 2016; Manca and

Ranieri, 2016; Veletsianos and Kimmons, 2013; Gruzd, Staves and Wilk, 2012; Veletsianos and Navarrete, 2012; Gu and Widén-Wulff, 2011). Therefore, there is still a paucity of research on understanding the predictors for both knowledge seeking and knowledge providing of ESNs in higher education. As a result, this thesis attempts to answer the following two research questions:

RQ.1 How do academic staff use ESNs in higher education?

RQ.2 What are the motivators for, and barriers to, using ESNs among academic staff in higher education?

The goal of online knowledge sharing in organisations is often to improve mutual learning among employees and employee job performance, which usually lead to the creation of organisational competitive advantage (Le and Lei, 2019). Therefore, to identify the drivers influencing consumptive and contributive ESN use in higher education, a helpful organisational theoretical lens needs to be implemented. From the several social-psychological models that have been developed to explain and predict technology acceptance and use, UTAUT has been found to be a robust instrument for examining individual technology-level use (Wang et al., 2014). However, there are clear signs of disparities in results when UTAUT has been used in different research settings (e.g., online banking, e-portfolio organisations and e-government organisations), including in terms of study behaviour intention and technology adoption (Madigan et al., 2017; Shroff, Deneen and Ng, 2011; Zhou, Lu and Wang, 2010). Furthermore, a few studies (e.g., Maican et al., 2019; Gruzd, Staves and Wilk, 2012) have used this theoretical lens as a framework by combining other factors or models to examine the use of social media by academics in the UK. However, these studies did not distinguish between contributive and consumptive use. As a result, this thesis attempts to answer the following research question:

RQ.3 How and to what extent does the modified UTAUT factors influence ESN consumptive and contributive use?

ESNs are designed to encourage the collaborative formation and circulation of knowledge, and it is no wonder that academic staff have discovered their use in recent years and research has been conducted into their usage (Fullwood, Rowley and Delbridge, 2013; Maican et al., 2019). However, a quantitative study is lacking to measure the benefits to academic staff in higher education for knowledge sharing on ESNs. As a result, this thesis attempts to answer the following research question:

RQ.4 To what extent do knowledge seekers gain benefits (e.g., research grants, attending events and showcasing, applying for an academic position) from using ESNs?

1.5 Research Method

In achieving the objectives and answering the research questions, a research methodology must be developed in order to conduct research in a systematic manner. The research employs mixed-method grounded theory methodology (MM-GTM) with critical realism philosophical principles to address the research problem. The research methodology chapter argues that a critical realism viewpoint is the most appropriate by placing the research within the practice-based view. From critical realism perspective, methodological triangulation or methodological pluralism may be beneficial in research strategy for the purposes of completeness and confirmation.

From a practical perspective, reality or phenomena exist independently of an individual. Online knowledge sharing is socially real because if humans did not exist, it would not exist. The research uses an exploratory sequential mixed-method design, the research begins with a qualitative phase followed by a phase of quantitative data collection and analysis. The research

employs case studies to analyse the information shared on the current ESNs within two higher education environments (university one and university two). The case studies chosen had to meet the following requirement. The academic staff on which the research focused are engaged in the current ESNs in knowledge creation and exchange activities with other academic staff. The information or knowledge shared through web chats allows the researcher to identify the current ESN role for university academic staff use.

The research objective is to examine factors influencing the use of enterprise social networking in communication and research opportunities between consumptive and contributive use in higher education. Focus groups were chosen because online knowledge sharing in higher education was relatively unexplored and a qualitative approach was required to collect the data needed. Moreover, Gruzd, Staves and Wilk (2012) suggested that focus group discussions are particularly suitable for investigating issues such as barriers using social media among academic staff, which not enough is recognized or where the problem is uncertain in previous literature. Focus group discussions can clarify particular behaviours or beliefs and the circumstances, assess service and identify reasons for its success or failure, and gain various abilities and viewpoints on the study topic.

To gain a better understanding of academic users experience of ESN platforms, it was planned to hold a discussion with consumptive and contributive users from various levels of work experience and age ranges, asking them to identify motivators for, and barriers to using ESNs in the university. The findings identified motivators for, and barriers to, adopting ESNs between academic and administrative staff. The data were analysed using grounded theory and NVivo qualitative analysis software and coded into various categories. The iterative process in qualitative grounded theory study allows quantitative analysis to be performed to confirm the relationships between structures and mechanisms derived from qualitative study.

After establishing an analysis, this research put the emerging theoretical frameworks to quantitative testing. The findings from grounded theory helped to refine the survey tool used in this study. Therefore, to identify the drivers influencing consumptive and contributive ESN use in higher education, the extended UTAUT has been employed as a helpful organisational theoretical lens. UTAUT has been found to be a robust instrument for examining individual technology-level use (Wang et al., 2014). To examine the impact of the key contributing factors of performance expectancy, effort expectancy, social influence, facilitating conditions, feature value, information value and relationship expectancy on academic staff knowledge sharing, statistical techniques, including factor analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modelling (SEM), were used for data analysis. The survey data were collected from academic staff within higher education in the UK who had experience of using ESNs (e.g., Microsoft Yammer, Microsoft Teams, Slack and Jive). Factor analysis was conducted to reduce the number of variables and extract the latent variables corresponding to the fundamental concepts. EFA was used to assess the factors underlying a set of variables. CFA was used to examine the reliability and validity of the variable and discriminant validity. The path- SEM technique was applied to estimate the model and test the hypotheses. The software for these purposes included the IBM (International Business Machines Corporation) Statistical Package for the Social Sciences (SPSS) version 26 and Analysis of Moment Structures (AMOS) version 26.

1.6 Original Contribution and Research Significance

This research is significant for both academic and non-academic settings. While ESN use seems to be gaining popularity among academic staff, many scholars have noticed an increasing need for research that looks more fully at the impact of enterprise social networking platforms in the context of higher education (Ortbach and Recker, 2014; Alshahrani and

Pennington, 2018). Previous research (Chin, Evans and Choo, 2015; Chin et al., 2019; Arshad and Akram, 2018; Dermentzi et al., 2016; Fullwood, Rowley and Delbridge, 2013) has focused on the contributing factors of online knowledge sharing that help to motivate individuals to share knowledge online. This study contributes to the information systems literature in technology acceptance and use of technology in following ways:

I. Developed a valid scale to measure factors influencing the use of enterprise social networking within a range of sectors.

By examining consumptive and contributive users and investigating the driving forces behind their online knowledge-sharing behaviour in higher education, the study provides practical insight into the driving forces behind these types of participants in the knowledge-sharing process and their influence on obtaining research opportunities and developing research partners. In addition, this study is one of the few scholarly resources that examine both consumptive users and contributive users in the online sharing process in higher education to investigate the differences in their driving forces. Therefore, this study:

II. Developed an extended UTAUT model, which explains a higher variance than the original model proposed by Venkatesh et al. (2003) (84 and 66 per cent of variance) toward using the technology by consumptive users and contributive users, respectively. This thesis empirically finds that the underlying factors of the model impact contributive use more than consumptive use. For example, knowledge providers are involved in more straightforward tasks (e.g., posting/sharing information) and they require less assistance and organisational facilitation; thus, these factors were believed to lead to more consumptive use than contributive use. In contrast to Chin et al.'s (2020) and Wang et al.'s (2014) assumptions about the nature of contributive use, this research found that these factors lead to more contributive use than consumptive use and, consequently,

make a new contribution to the higher education research context. More specifically, the findings show that contributive use was significantly influenced by performance expectancy, effort expectancy, social influence, feature value and relationship expectancy. At the same time, facilitating conditions did not play a prominent role in influencing contributive and consumptive ESN use. The findings also reveal that feature value and relationship expectancy significantly impact consumptive ESN use.

As knowledge-sharing benefits are critical in measuring the effectiveness of the knowledge-sharing process (Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Nández and Borrego, 2013), this study extended Venkatesh et al. (2003) model to:

III. Include professional benefits in research measurement. This thesis found that the more users consume from the platform, the more benefits (e.g., receiving research grants, getting an academic position, taking part in a workshop) they will get.

From a practical viewpoint, this research also makes several valuable contributions to universities. Most academics and university administrators would accept that the importance of obtaining research grants is on the rise (Polster, 2007). Therefore, these platforms turn scholars into competitors for research funding. Based on the results in this research, academic staff avoid exchanging knowledge on intra-organisational platforms for fear of losing valuable information; they prefer to talk with a person who wrote a post in a private channel (e.g., telephone conversation, email or face to face). Based on the findings this study suggests that:

IV. Managers should not rely on open systems such as Microsoft Yammer for academic staff to use for specific tasks such as getting research funds. Typically, the research indicates that Microsoft Yammer is a potentially helpful first stage of the research collaboration process (i.e., a notice board facility) rather than a full-blown collaboration tool.

V. University research staff could help their scholars find a more comprehensive range of funding sources matching scholars' interests to the requirements of various funders using these systems.

VI. Managers could identify individuals within the university (such as those who are very active and engaged or workers who hold positions like business change manager) and recruit them as corporate spokespersons to promote ESN usage in universities.

1.7 Structure of the Thesis

This thesis has been structured into six chapters, with each one addressing a distinct point in carrying out this research project. Below is a brief outline of each chapter:

Chapter One introduces the background information on online knowledge sharing among academic staff globally and within the UK. Next, the research gaps and problems for this study are identified. Finally, the research objectives, research questions and methods, along with the original contribution and significance of the study, are elaborated.

Chapter Two reviews the knowledge-sharing literature related to online knowledge-sharing in higher education and two types of participants, consumptive users and contributive users. First, the theoretical background of the UTAUT model is reviewed. Then, the key contributing factors of performance expectancy, effort expectancy, social influence, facilitating conditions, information value, feature value and relational expectancy, along with knowledge-sharing benefits for academic staff, are presented. Finally, hypotheses regarding the differences in the impact of the critical factors on knowledge sharing between consumptive and contributive users are proposed to build a conceptual framework.

Chapter Three outlines the methodological design. This chapter elaborates on the choice of research philosophy, research methods and data collection methods. The data collection strategies are also presented. Then, the data analysis techniques are presented along with the research instrument and scales, the pilot study results, the sample, the questionnaire design, software packages and statistical techniques used in this research. Finally, the ethics of this research has been discussed.

Chapter Four presents the preliminary results of the study's qualitative and preliminary quantitative analyses with descriptive statistics, data screening, and exploratory and confirmatory factor analysis. This chapter examines the fundamental characteristics of the data to ensure that they are reliable for the subsequent statistical techniques. Moreover, Chapter Four presents SEM as the statistical analysis method. This chapter also reports on model specification and outer model evaluation. The results of the hypotheses testing are elaborated according to the hypotheses developed in Chapter Two. Finally, the results of bivariate analyses and invariance analyses results are reported.

Chapter Five provides a comprehensive discussion of the results revealed in Chapter Four. The chapter also presents the significant conclusions that can be drawn from the research and evaluates the contribution to knowledge. Finally, it ends by elaborating on the scope for further research in topics related to this research.

Chapter Six provides a brief and final summary of the overall findings of this study. In addition, it addresses the study's limitations that would affect the process of the generalisation of the results. Finally, it presents the proposed areas for further study and recommendations.

Figure 1.1 presents a summary outline of the thesis structure.

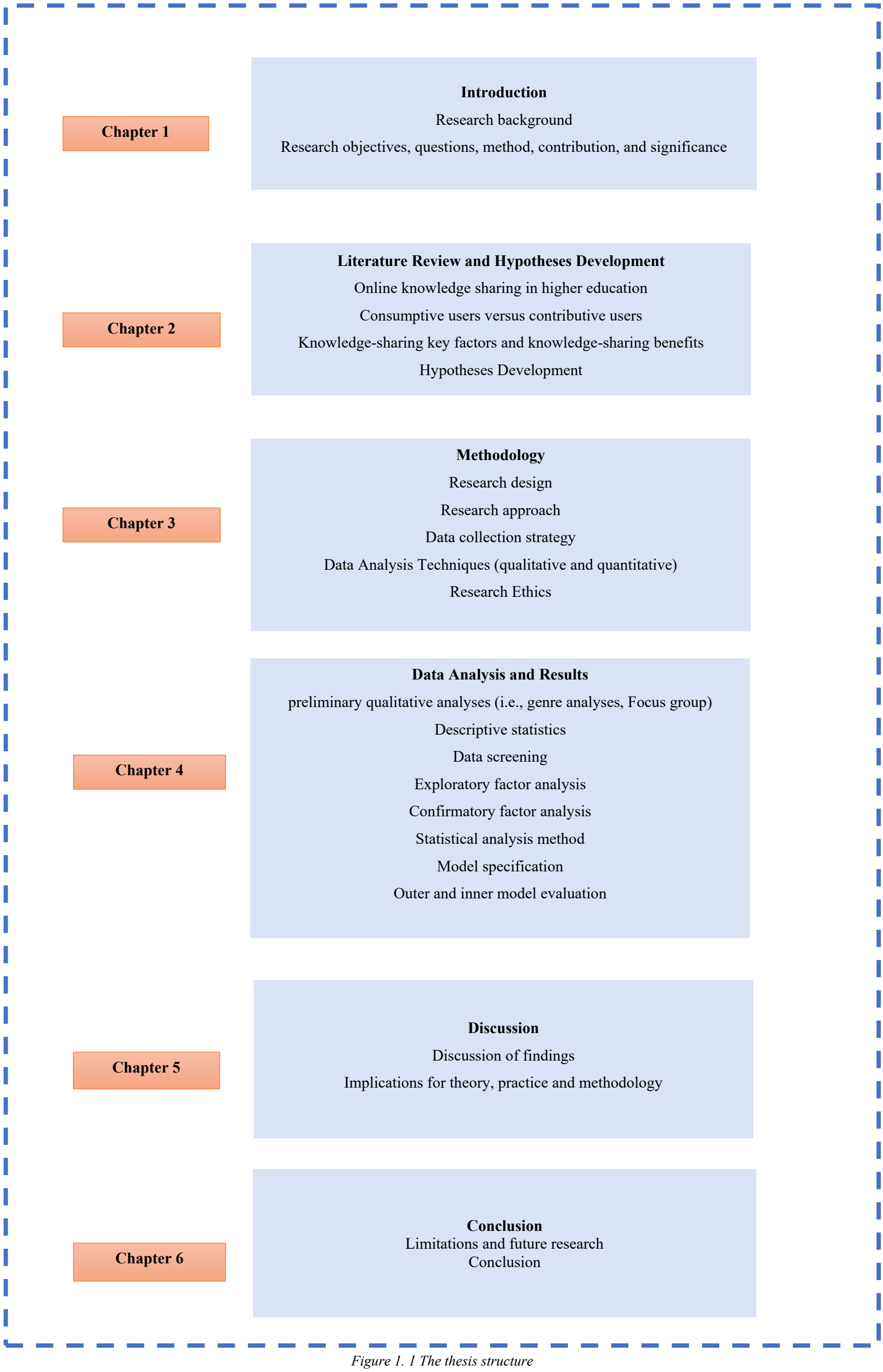

Figure 1. 1 The thesis structure

Chapter Two: Literature Review and Hypotheses Development

Chapter Two: Literature Review and Hypotheses Development

2.1 Introduction

Chapter Two presents the key arguments on which this thesis is founded, including the hypotheses related to the research questions in Chapter One. In particular, the chapter outlines online knowledge sharing in organisations and two types of users: consumptive users and contributive users. Then, the key factors influencing online knowledge sharing among academic staff in higher education and the main advantages of online knowledge sharing are defined. The remainder of the chapter presents hypotheses to address the four research questions of this study.

2.2 Background

2.2.1 Knowledge Sharing in Higher Education Institutions

Knowledge is a practical resource allowing communities, systems, and people to obtain many benefits, in particular, enhanced education and training, invention and decision-making (Al-Busaidi and Olfman, 2017). Davenport and Prusak (1998, p. 5) defined knowledge as "a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information". Knowledge should be circulated and distributed before individuals can profit from it (Al-Busaidi and Olfman, 2017). Connelly and Kelloway (2003) separated the definition of knowledge sharing from information sharing. Connelly and Kelloway (2003, p. 294) defined knowledge sharing as "a set of behaviours that involve the exchange of information or assistance to others". They added that information sharing entails management of making enterprise information accessible to workers at all stages. Many studies (e.g., Rode, 2016; Durst and Wilhelm, 2012)

state that online knowledge sharing had become the most critical competitive advantage of the organisation, and knowledge should be managed to promote the organisation's economic performance (Mahdi, Nassar and Almsafir, 2019).

Knowledge can be classified as explicit (officially documented) or tacit (identified but not officially documented) (Bandera et al., 2017). Explicit knowledge refers to “academic knowledge or “know-how” that is described in formal language, print or electronic media, often based on established work processes, use people-to-documents approach” (Smith, 2001, p. 314). Tacit knowledge refers to “practical, action-oriented knowledge or “know-how” based on practice, acquired by personal experience, seldom expressed openly, often resembles intuition” (Smith, 2001, p. 314). Tacit knowledge does not lend itself to being recorded because it is ingrained in the individual's mind (Cleveland, 2016).

Nonaka and Takeuchi (1995, cited in Cleveland, 2016, p. 3) suggested that the knowledge creation model is an iterative process comprising "socialisation, externalisation, combination and internalisation" patterns of knowledge sharing. The socialisation phase refers to consumers who learn from the experiences of others by constantly engaging with them and following experts (contributors). Externalisation refers to transferring tacit knowledge to explicit knowledge, and this phase includes sharing thoughts, ideas, descriptions, and files. The combination phase refers to people's participation in explicit-to-explicit knowledge creation by using meetings, conversations, and information systems to classify and connect knowledge in the combination pattern (Cleveland, 2016). Finally, in the internalisation phase, individuals recall and apply new knowledge after learning from explicit knowledge assets (from explicit to tacit) (Bandera et al., 2017).

While any organisation has access to explicit knowledge, tacit knowledge is a competitive advantage for any organisation. The externalisation of tacit knowledge into shared explicit

knowledge creates more opportunities for collaboration and innovation (Olaisen and Revang, 2018) as well as a method for retaining knowledge in an organisation (should someone retire or leave). The interaction among employees helps corporations to achieve competitive advantage (García-Juan, Escrig-Tena and Roca-Puig, 2019). Organisations can build the environments to encourage employees to contribute and share their knowledge as a means to maximise their contribution to the collection of ideas (Amayah, 2013). Moreover, creating and developing relationships among employees supports the sharing of tacit knowledge within an organisation (Olaisen and Revang, 2018; Maravilhas and Martins, 2019).

Knowledge sharing has usually been examined in terms of profit, such as lowering production costs, creating solutions, and increasing productivity in organisations (Al-Kurdi, El-Haddadeh and Eldabi, 2018). But knowledge plays a crucial role in HEIs, and academic staff could benefit from knowledge sharing (Al-Kurdi, El-Haddadeh and Eldabi, 2018). Organisations use the available tools and techniques to systematically organise, preserve, and share organisational information to acquire this competitive advantage. Consequently, KM has become an important strategy for public and private organisations to meet their goals (Amayah, 2013; Fullwood, Rowley and Delbridge, 2013). Horwitch and Armacost (2002, p. 28) defined KM as "the practice of creating, capturing, transferring, and accessing the right knowledge and information when needed to make better decisions, take actions, and deliver results in support of the underlying business strategy".

HEIs ought to establish an active knowledge sharing environment for effective KM across academic staff (Jolaee et al., 2014). Only a few empirical studies (Jolaee et al., 2014; Fullwood, Rowley and Delbridge, 2013) have examined factors affecting knowledge sharing among academic staff in universities. An academic's intention and behaviour toward knowledge sharing plays a vital role in the accomplishment of KM (Amayeh, 2013). KM has been

recognised as a significant mechanism within academia, specifically defined as research, teaching and publication (Hussein and Nassuora, 2011). Competitive pressure, continuous learning, commercialisation and openness of higher education, modern technologies, and government, demand economic feasibility and the accessibility of valid information (Al-kurdi, El-Haddadeh and Eldabi, 2018). As a result, the adoption of successful KM strategies may define the journey ahead for universities (Al-kurdi, El-Haddadeh and Eldabi, 2018). According to Al-kurdi, El-Haddadeh and Eldabi (2018, pp. 232-233), "a positive approach to KM by HEIs would facilitate the transition to a knowledge-based economy, enhance knowledge sharing, improve educational programmes and consequently improve the overall performance of universities".

According to Fullwood, Rowley and Delbridge (2013), knowledge storing is more prevalent than knowledge transfer among academic staff. Fullwood, Rowley and Delbridge (2013) and Jolaee et al. (2014) added that there appears to be a tacit knowledge sharing culture in universities, which poses difficulties for universities seeking to enhance the processes through which knowledge is generated, exchanged, and disseminated. The tacit knowledge or intellectual property of academic staff is rooted in their minds, and a lack of knowledge dissemination among academic staff leads to underuse of resources (Ramayah, Yeap and Ignatius, 2013). Existing studies (Jolaee et al., 2014; Ramayah, Yeap and Ignatius, 2013; Kim and Ju, 2008) constantly emphasise the low desire of academic staff to disseminate knowledge, which is turning into an issue in higher education today due to giving a higher priority to individual achievement (Ridzuan and Sam, 2008). According to Ridzuan and Sam (2008), academic staff inhibit their knowledge dissemination when they have valuable and vital knowledge that other academic staff do not hold. In other words, academic staff avoid exchanging knowledge for fear of losing valuable information by exposing it (Ridzuan and Sam, 2008). Ridzuan and Sam (2008) explained that unwillingness to share knowledge with

others is an accepted human impulse. Moreover, academic staff ignore the fact that effective collaboration between them would enhance their success rather than impeding it.

According to Ramayah, Yeap and Ignatius (2013) knowledge sharing behaviour between academic staff involves:

a) Sharing knowledge by way of written chapters or research articles.
b) Contributing knowledge in formal communications during workshops or meetings.
c) Contributing knowledge in informal communications.
d) Sharing knowledge via knowledge networks.

HEIs play a crucial role in knowledge production, and academic staff play a pivotal role in knowledge dissemination (Ramayah, Yeap and Ignatius, 2013). Public academic institutions are confronted with a growing demand for contributing high-quality resources and knowledge. HEIs aim to enhance their performance by employing first-rate KMSs. By doing so they increase the number of graduates with analytical and problems solving skills and build a knowledge-based culture. KM of academic staff includes creating, obtaining, loading, and sharing knowledge appropriately with other knowledge consumers (Kim and Ju, 2008). The reason that knowledge sharing among academic staff is vital is because knowledge can be managed to solve issues in the society at large, to create fellow faculty partners at the university, to boost performance growth and output at the university, and to generate business opportunities for the university (Ramayah, Yeap and Ignatius, 2013).

Employing ESN is an elegant solution for communication and collaboration between academic staff. The emergence of ESN may allow both formal and informal knowledge sharing (Qi and Chau, 2018). Recent evidence (e.g., Maican et al., 2019; Aldahdouh, Nokelainen and Korhonen, 2020) shows that many universities have recently embraced ESN such as Microsoft

Teams, Microsoft Yammer, Chatter, or other tools for increasing communication, building relationships, and improving knowledge sharing among academic staff. The expected benefits of this social network have not been completely understood owing to the comparatively low use of such networks between academic staff (Maican et al., 2019). Academic staff may adopt ESN for feeding (consuming) information and knowledge. Consumptive ESN users may ask questions about work-related problems, read a news feed, search, and download files. Other academic staff may use the platform for donating information and knowledge (contributing), such as responding to enquiries from other academic staff, posting information, of uploading files (Chin, Evans and Choo, 2015).

2.2.2 Enterprise Social Networks as a Knowledge Management System

For centuries, KM has involved a mechanical method wherein individuals participate in knowledge building and recover it when needed. The development of Web 2.0 technologies means that KM as a theory is being refreshed due to individuals interacting, generating and distributing content generated by other users. According to Mäntymäki and Riemer (2016), who reviewed a number of studies (such as von Krogh, 2012), ESN has the potential to improve knowledge management, boost employee productivity, and so play a strategic role in an organisation's information technology (IT) investment. ESNs can improve social value (Mäntymäki and Riemer, 2016), information exchange and interaction (Davison et al., 2014; Leonardi and Meyer, 2015), and the quicker adoption of new staff (Davison et al., 2014). Mäntymäki and Riemer (2016) examined how ESN's bring value for its users. Mäntymäki and Riemer (2016) found that obtaining and generating ideas for one's work and engaging discussion with colleagues are primary contributors to value. Mäntymäki and Riemer (2016) discovered that having conversations with coworkers and coming up with ideas for an individual's job are the main contributors to value. They suggested setting up corporate rules

and policies to promote and encourage users' initiatives to innovate with ESN. While the studies discussed above revealed that ESNs increased employee performance in varied settings, academic staff members were unwilling to share tacit knowledge (such as ideas or experiences) unless they gained valuable knowledge from their peers; however, they would share non-tacit (i.e., information already published) knowledge openly.

ESNs progressively attract academic and industry research (Arshad and Akram, 2018; Aboelmaged, 2018). Maican et al. (2019) examined personality traits and the dimensions of the TAM between academic staff within Romanian universities. The relationship between personality traits and ESNs in academic work-life is demonstrated as influenced by work engagement, strengthening teacher resources, and improving achievement levels. Gruzd, Staves and Wilk (2012) and Maican et al. (2019) suggested that an ESN has an effect on academic success for teachers and researchers. Gruzd, Staves and Wilk (2012) examined the UTAUT factors that influenced the intention and use of social media by scholars through 51 interviews within the American Society for Information Science and Technology (ASIS&T). Scholars stated the two main advantages of social media were building new relationships, and maintaining existing relationships. However, Gruzd, Staves and Wilk (2012), also identified three disadvantages of social media: controlling private versus public content, information flow and, keeping personal and professional elements separate (e.g., maintaining separate profiles or using different social networks).

Even though there are several studies evaluating the use of social networking technologies for teaching and learning in higher education (e.g., Veletsianos and Kimmons, 2013; Dumpit and Fernandez, 2017; Dyson et al., 2015; Hamid et al., 2015; Uusiautti and Määttä, 2014; Hung and Yuen, 2010), empirical studies done on their usage for professional and networking services for contributing and consuming information about research works is not well

established (e.g., Maican et al., 2019; Gruzd, Staves and Wilk, 2012; Arshad and Akram, 2018; Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Dermentzi et al., 2016; Donelan, 2016; Manca and Ranieri, 2016; Gu and Widén-Wulff, 2011; Al-Aufi and Fulton, 2014). Furthermore, the literature presents differences in social network usage based on disciplinary variations. For instance, microblogging (e.g., Twitter) has been used to connect with their peers and promote their work (Al-Aufi and Fulton, 2014).

Maican et al. (2019) and, Gruzd, Staves and Wilk (2012), Manca and Ranieri (2016) are some studies that focused on factors influencing the use of social media tools among academic staff for research and knowledge sharing without specifying two types of users, consumptive users, and contributive users. These few studies have chosen either a qualitative or quantitative approach (e.g., interviews and surveys) to investigate factors affecting the use of ESN among academic staff. Such scholars (e.g., Maican et al. 2019; Manca and Ranieri, 2016; Arshad and Akram, 2018; Al-Daihani, Al-Qallaf and AlSaheeb, 2018) conducted surveys to assess the individual acceptance and use of ESN in higher education, and have used information system (IS) models such as TAM, UTAUT with merging personality traits, the decomposed theory of planned behaviour (DTPB) and the uses and gratification theory. These scholars explained that these models are appropriate for understanding behaviours and intentions in IT studies and examined the uses of new technologies by individuals. Other scholars (e.g., Gruzd, Staves and Wilk, 2012, Donelan, 2016) employed UTAUT in semi-unstructured interviews to assess academic staff behaviour toward ESN use. These scholars suggested that adopting UTAUT in a qualitative study could explain why academic staff are more or less likely to adopt and use a particular information technology. According to Gruzd, Staves, and Wilk (2012), Facebook's public nature makes it challenging to manage personal and business interactions. However, they added that this challenge is mitigated with the development of ESNs (e.g., Microsoft Yammer) designed explicitly for particular communities.

2.3 Enterprise Social Networks

Some social networks are specifically intended to support two-way communication, while others, like Twitter, are designed for broadcast or multicast subscription-based communication (Conole and Culver, 2010). Several desired social network features can affect both educational and commercial activities. Some popular social network features in the technical context are listed below (Gannod and Bachman, 2012).

- Status updates: the ability to post a broadcast or multicast message to a set of participants in a network.
- Commenting: the ability to comment on status updates or other posts within a network.
- Positive reinforcement: the ability to indicate like or approval, or disapproval or dislike of a post.
- Social tagging: the ability to mark content with keywords to show its relevance to a topic.
- Linking: the ability to add hyperlinks to content, including video. Video and teleconferencing ability to communicate with one or more network members via video.
- Instant Messaging (IM) support: the ability to "chat" with one or more network members.
- Document support: the ability to create and share documents.
- Video support: the ability to share video content.

There has been a steady rise in the adoption of collaborative social networking platforms in firms. The pressure is on businesses to adopt new technologies to facilitate information and knowledge sharing among communities and to seek similar benefits with ESNs for employees (Azaizah et al., 2018). According to Azaizah et al. (2018), ESNs refer to technologies involving

initial features that are essential to PSNSs but are applied within organisations. However, these tools are specifically designed for internal communication among employees, and management can control access permissions (Azaizah et al., 2018). Mäntymäki and Riemer (2016, p.1042) explained that ESNs are "web-based platforms that allow individuals to: (1) communicate messages with their colleagues or circulate messages to everyone in the workplace; (2) clearly indicate or tacitly reveal specific collaborators as communication partners; (3) post, edit, and sort text and files linked to themselves or others; (4) view messages, connections, writing and data communicated, posted, edited and sorted by anyone else in their organisation at any time". These new tools are implemented inside organisations and authorised by management, and usually, only individual members of a specific organisation can join the platform. Wehner, Ritter and Leist (2017) stated that implementing ESNs provides a new platform for workers to converse, manage, work together, use, and generate content and knowledge. Salesforce's Chatter, Microsoft Teams, Microsoft Yammer, IBM Connections and Jive are examples of such incorporated enterprise social software tools (Leonardi, Huysman and Steinfield, 2013; Choudrie and Zamani, 2016; Khincha, Chauhan and Ekwobi, 2020). Organisations that control such programs can receive significant benefits from their usage, including improved location for relevant knowledge, enhanced recognition of experts, continuous learning and information innovation and input, and developing relationships (Choudrie and Zamani, 2016; Khincha, Chauhan and Ekwobi, 2020). However, Maican et al. (2019) found that academic staff only occasionally used ESNs (such as Microsoft Yammer) for their research and teaching activities.

2.3.1 Microsoft Yammer

Yammer was introduced in September 2008 and has grown significantly since then on a global scale (Bell, 2012). Yammer is a Microsoft-owned ESN service platform with several Web 2.0 elements and an appearance similar to a standard public social network like Facebook (Scarso

and Bolisani, 2020). The service uses networking ideas, with each network often representing a single organisation. By logging on with their business email address, anyone may form a network to which more users can subscribe (Riemer and Scifleet, 2012). Many universities have adopted Microsoft Yammer for information and knowledge sharing among academic staff to enhance collaboration and teamwork (Aldahdouh, Nokelainen and Korhonen, 2020; Maican et al., 2019). Aldahdouh, Nokelainen and Korhonen (2020) examined technology adoption among academic staff in HEIs for personal and professional purposes. They found that Microsoft Yammer was the most popular of the social media tools used between academic staff for professional purposes. They added that the results revealed the increasing orientation of academic staff toward using social network sites (SNSs) designed for their use (e.g., Microsoft Yammer).

Everyone can generate a network by enrolling with their company email address, and new users can join after that (Riemer, Scifleet and Reddig, 2012). Like Twitter, Yammer is based on the "follower" notion where users can select who to follow (Riemer, Scifleet and Reddig, 2012, p. 4). Users can view this customised creek or follow the "all company" stream (Riemer and Scifleet, 2012, p.4). Yammer offers adaptable features including publishing activities and events, praising, publishing polls, group notes, conversation, online teamwork, uploading group documents, sharing links to websites, syncing photos, updates/posts to the group and update/posts to the whole association (Leonardi, Huysman and Steinfield, 2013). In contrast to Twitter's limitations, messages are not length controlled (Cleveland, 2016). All replies to a post are clustered and presented chronologically underneath the message they are linked to, forming a dialogue thread (Riemer, Scifleet and Reddig, 2012). According to Howard and Ryan (2010, p. 3), Yammer is an online social networking platform that addresses the concept of "What are you working on?" to promote conversation. As with setting up any social networking site such as Facebook, Yammer requires no technical set-up, involving just a simple sign-up process and

necessary profile customisation. Although Yammer restricts invite-only employees within one organisation that has implemented a Yammer enterprise, each network regulates invited users by their email domain name (Howard and Ryan, 2010). Yammer provides two types of networks: domestic and external networks (Howard and Ryan, 2010). Groups in Yammer include several members in a network and can be formed according to requirements such as a specific topic or a project team (Riemer, Scifleet and Reddig, 2012). Users can create two types of groups: private or public. All network members can view messages in open groups and can join them (Riemer, Scifleet and Reddig, 2012). However, the conversations and posts in private groups are only available to team members, and only invited users can join the group (Riemer, Scifleet and Reddig, 2012).

There are several ways to organise the structure of the message stream. Typically, Yammer presents the "Top Conversations" (Riemer, Scifleet and Reddig, 2012, p. 6), which are picked automatically via an internal algorithm. In addition, the user can, scroll down the home page to view conversations from the groups they are following, or open posts shared on the homepage (Riemer, Scifleet and Reddig, 2012).

2.3.2 Microsoft Teams

A collaboration tool called Microsoft Teams was developed from Microsoft's Skype for Business and introduced in 2017 (Ferreira, 2021). Microsoft Teams is a cloud software program digital hub that carries conversations, meetings, files, and apps composed in a single management system by integrating most of the services included in Microsoft 365 (Martin and Tapp, 2019). Microsoft Teams enables real-time interaction and teamwork regardless of where individuals are located (Khincha, Chauhan and Ekwobi, 2020). Martin and Tapp. (2019) asserted that some collaborative chat tools, such as Microsoft Teams and Zoom, extend functionality that email cannot offer, such as chat rooms, videoconferencing, lecture-style and

other popular social media features (i.e., posting, commenting and liking). This technology app could operate with the entire organisation or individual programs; an organisation's IT department can integrate Office 365 and easily integrate Teams and could perform through platforms and devices (i.e., a web browser, a desktop application, a mobile application and a certified Microsoft Teams device) (Poston, Apostel and Richardson, 2020).

Meetings and chats are two of Microsoft Teams' key feature categories (Ferreira, 2021). In Microsoft Teams, the chat function plays a key role. It enables individuals to interact with their colleagues via text in one-on-one or group chats that may be made public or private. Microsoft Teams' meeting function offers a rich environment that enables cooperation with colleagues who are not in the near area. It lets users instantly connect with individuals worldwide in the exact virtual location. Each participant can share screen sharing and high-definition videos during meetings. In addition, Microsoft Teams allows for the recording and sharing of meetings (Ferreira, 2021). Table 2.1 presents some essential features of these tools used as videoconferencing. Some studies (e.g., Rizvi and Nabi, 2021; Therón, Garcia-Holgado and Marcos-Pablos, 2021) recently examined the adoption of Microsoft Teams for teaching and communication among students, administrative staff, and academic staff. These studies discovered that Microsoft Teams had provided a valuable space to improve communication between students and academic staff.

Table 2. 1 Summary of videoconference features and descriptions – MS Teams

Feature	Description
Screenshare	The meeting host or participants can share their device screen with other participants.
Whiteboard	Host/participant can create a white painting seen by all participants. The whiteboard can be used to draw with various colours, pens or text.
Polling	The host can write 255-character multiple-choice questions with ten choices that can be shared with the group.
Breakout rooms	The host can separate the group into smaller groups for a specific period before resuming as a larger group. Each group can connect with the host to invite them to join their group for a discussion.
Annotation	Participants may use the same tools that are available to draw on the whiteboard to explain on any screen that is shared.
Chat and file share	Like instant messaging, participants can share messages with the entire group or individual participants.
Non-verbal feedback	Participants can converse with the host using present reactions (e.g., yes, no and raise hand).
Virtual background	The user uploads a photo or uses existing pictures (e.g., outer space) to change their location.
Recording	The session is recorded and stored on either the host's computer or the app cloud account. Chat sessions and an audio transcript of the session are also saved.

Source: Hilburg et al. (2020)

2.4 Consumptive Users and Contributive Users

Community users on ESN platforms can be categorised into two groups: consumptive users and contributive users (Nguyen, Malik and Sharma, 2021). Several scholars (Nguyen, Malik and Sharma, 2021; Wang et al., 2014; Marett and Joshi, 2009) have examined the differences between consumptive users and contributive users regarding knowledge sharing behaviour and they found a discrepancy between these two groups (consumptive users and contributive users). Although most studies have focused on assessing knowledge-contributing behaviour, most users in ESNs are consumptive users (Nguyen, Malik and Sharma, 2021). Therefore, reviewing both types of users enables a comprehensive awareness of knowledge sharing behaviours.

Consumptive users refer to "the extent to which employees use an ESN for acquiring knowledge from the platform (e.g., by reading a wiki entry or accessing a document)" (Kügler, Lübbert and Smolnik, 2015, p. 813). Contributive users refer to "the extent to which employees use an ESN for contributing knowledge to the platform (e.g., by posting a blog entry or uploading a document)" (Kügler, Lübbert and Smolnik, 2015, p. 813). Cleveland (2016, p. 2) explained that the knowledge-seeking process is defined as "the active pursuit of information to fulfil precise knowledge needs". In this thesis, exchanges between seekers and contributors result in a dynamic knolwedge sharing procedure that involves the information obtained, association, allocation and recycling of community practical experience.

Nguyen, Malik and Sharma (2021) explained the most valid reasons why consumptive users do not actively contribute to ESNs, as Preece, Nonnecke and Andrews (2004) stated. These reasons consist of: (I) because contributors have posted related information to solve the problem; (II) knowledge seekers are taking time to find out about the online society; (III) knowledge seekers do not know how to use ESNs, and are incapable of posting content or lack the time to post content; (IV) contributing may not be helpful because knowledge seekers are

supposed to have nothing to offer; and (V) knowledge seekers feel shy about contributing or choose to continue anonymously (Nguyen, Malik and Sharma, 2021). However, consumptive users can be active and data-driven members, exhibit different behaviours and use a selection of approaches to contribute to ESNs (Nguyen, Malik and Sharma, 2021). Preece, Nonnecke and Andrews (2004) claimed that consumptive users might want to grow to be more comfortable with ESNs and societies on these platforms to create a sense of belonging and trust before contributing. Consumptive users might be waiting for the appropriate time to contribute on the platform (Setoyama, Yamazaki and Namayama, 2011). Table 2.2 summarises studies comparing knowledge seekers and knowledge contributors in online knowledge sharing.

Table 2. 2 Studies comparing consumptive users and contributive users in online knowledge sharing

No.	Study	Aim	Independent variable	Dependent variable	Sector	Method	Sample size	Findings
1	Chatterjee *et al.*, (2021)	Examining the role of contributive users and consumptive users in the multiple companies using ESN for cross-country collaboration.	Importance of knowledge sharing. Experience in using ESN Resistance to change by employees.	ESN' intention (knowledge contributors, knowledge seekers)	Multiple countries	Survey	471	Knowledge contributors and knowledge seekers have influence on the importance of knowledge sharing in the intention to use ESN. Knowledge contributors and knowledge seekers have influence on the experience in using ESN in the intention to use ESN. Knowledge contributors and knowledge seekers have no influence on the impact of employees' resistance to change in the intention to use ESN.
2	Chin et al. (2020)	Examining the *impact* of extended UTAUT factors on ESN consumptive use and contributive use.	Performance expectancy Effort expectancy Social influence Facilitating condition Content value Relationship expectancy	Consumptive use Contributive use	Professional service firms	Survey	158	The effect of performance expectancy, content value and facilitating conditions are more robust for consumptive use. The effect of effort expectancy, social influence and relationship expectancy affects solely contributive use.

Table 2.2 Studies comparing consumptive users and contributive users in online knowledge sharing (cont.)

No.	Study	Aim	Independent variable	Dependent variable	Sector	Method	Sample size	Findings
3	Beck, Pahlke and Seeback (2014)	Examining the individual characteristics of knowledge seekers and knowledge contributors on interactions (knowledge sharing) occurred	**Knowledge contributor** Reputation Habit of cooperation Group identification Norm of reciprocity Indebtedness Dyadic relationships **Knowledge seeker** Social status Channel variety in the network Social presence Norm of reciprocity Dyadic relationships	Quality of knowledge transferred	Multinational financial services provider	Messages posting on ESN- Content Analysis	15505	The higher a knowledge seeker's channel variety in the network, social presence and social status, the better the quality of the knowledge exchanged. The stronger the norm of reciprocity in a dyadic relationship between a knowledge seeker and a knowledge contributor, the better the quality of the knowledge exchanged. The higher a knowledge contributor's indebtedness in a dyadic relationship with a knowledge seeker, the better the quality of the knowledge exchanged. Knowledge contributor's reputation have no impact on the quality of knowledge exchanged. Knowledge contributor's habit of cooperation in the network have no impact on the quality of knowledge exchanged. The intellectual closeness in a dyadic relationship between knowledge seeker and knowledge contributor have no impact on knowledge exchange.

Table 2.2 Studies comparing consumptive users and contributive users in online knowledge sharing (cont.)

No.	Study	Aim	Independent variable	Dependent variable	Sector	Method	Sample size	Findings
4	Bartikowski and Walsh (2014)	Examining product reviews from consumer opinion platforms affects individual users' brand-buying behaviour.	Perceived community attitude toward the product. Attitude toward product Attitude toward brand User type (contributors/ seekers)	Attitude toward product. Attitude toward brand. Brand intention	French consumer reviews platforms	Survey	270	Perceived community attitude toward the product for contributors and seekers relates positively to individual attitudes toward the product and brands. - Perceived community toward attitude through product attitude have indirect effect of on contributors and seekers. Perceived community toward attitude have no direct impact to brand intentions. User type (contributors and seekers) moderates the relationship between perceived community attitudes toward products.
5	Nguyen, Malik and Sharma (2020)	Examining factors influencing knowledge seekers' and knowledge providers' Knowledge sharing intention by employing the theory of planned behaviour (TPB) model and motivational model (MM).	Self-efficiency Self-enjoyment Reciprocity- Rewards Subjective norms Attitudes toward knowledge sharing. Perceived behaviour control	Attitudes toward knowledge sharing Know*le*dge sharing intentions	Vietnamese telecommunicati on organisations	Survey	501	Self-efficacy has a positive influence on the attitude toward online knowledge sharing of contributors than seekers.- Reciprocity has positive influence on the attitudes toward online knowledge sharing for contributors but not for seekers.- Self-enjoyment has a stronger positive influence on the attitude toward online knowledge sharing of seekers rather than contributors. Social Norms have a positive influence on the online knowledge sharing intentions and no difference among seekers and contributors. Reward has a stronger positive influence on the attitudes toward online knowledge sharing for contributors.

Table 2.2 Studies comparing consumptive users and contributive users in online knowledge sharing (cont.)

No.	Study	Aim	Independent variable	Dependent variable	Sector	Method	Sample size	Findings
6	Yang, Li and Huang, (2017)	Examining the influence of perceived online community support and member relations on members' community commitment from an integrated perspective.	**Perceived community support** Perceived support for members communication Perceived recognition of contribution. Perceived freedom of expression. User type **Moderators** Trust Norm of reciprocity	Commitment	Members communications from an online education platform.	Survey	226	Online community support factors have a significant effect on members' commitment to the community among contributors and seekers. Perceived support for member communication has a stronger impact on contributors' commitment than seeker's commitment. Perceived recognition for contribution and perceived freedom of expression has a stronger impact on seeker's commitment than that of contributors. Trust moderated the effect of perceived freedom of expression on commitment among seekers. Trust does not moderate with contributors. The sense of trust among knowledge seekers would reinforce the effect of the felt expression freedom on their online community commitment The sense of trust among contributors does not reinforce the effect of felt expression freedom on their online community commitment. Reciprocity may entirely replace the impact of speech freedom on a contributor's commitment for those who do not frequently publish messages online and engage with other members.

Table 2.2 Studies comparing consumptive users and contributive users in online knowledge sharing (cont.)

No.	Study	Aim	Independent variable	Dependent variable	Sector	Method	Sample size	Findings
7	Hung, Lai and Chou, (2015)	Investigating the formation of posters' and lurkers' behavioural intention within the virtual professional community.	Perceived usefulness Perceived ease of use (PEOU) Perceived compatibility Reputation Reciprocity Enjoyment in helping others Interpersonal trust Peer influence Knowledge self-efficacy Resource availability Attitude toward knowledge sharing Subjective norms of knowledge sharing Perceived behaviour control of knowledge sharing	Attitude toward knowledge sharing. Subjective norms of knowledge sharing. Perceived behaviour control of knowledge sharing Knowledge sharing intentions	Taiwanese's information technology companies	Survey	423	Enjoyment in helping others have a significant impact on contributors' attitudes toward knowledge sharing, whereas PEOU, perceived compatibility, and reciprocity jointly have a significant impact on seekers' attitudes. Technological factors, such as PEOU and compatibility, have a significant influence on seekers' attitude toward knowledge sharing. Perceived usefulness and reputation have no impact on both contributors and seekers' attitudes toward knowledge sharing. Social norms indirectly affect seekers' attitude for knowledge sharing. Peer influence is more influential for seekers, whereas interpersonal trust is more influential for contributors. Resource availability has a stronger influence on seekers' than on contributors. knowledge self-efficacy has a stronger influence on contributor than on seekers.

In summary, Table 2.2 presents an overview of the value of online knowledge sharing in sustaining organisational competitive advantage. From a managerial viewpoint, organisations often implement social media to facilitate online knowledge sharing among staff because of the substantial benefits of online knowledge distribution. From the individual viewpoint, staff use social media with two different levels of engagement, leading to consumptive use and contributive use. Since most studies investigate indifferent general online knowledge sharing members or knowledge contributors, there is a paucity of studies examining the driving forces of both knowledge seekers and contributors in enterprise social network. The difference between the driving forces of both contributive users and consumptive users may lead to different Knolwedge sharing administrative effects.

For instance, Chatterjee et al. (2021) applied a theory of valance, instrumentality and expectancy (VIE) to assess individual factors influencing the use of ESN in multi-national companies. Employees were encouraged if they genuinely believed that using ESN for communication and knowledge sharing was beneficial for their work, facilitated effective knowledge sharing and were confident to use the tool. The result of the study revealed that knowledge contributors and knowledge seekers were moderators for using ESN for knowledge sharing. The moderating effects of knowledge contributors and seekers on the importance of knowledge sharing and the experience of using ESN were supported. As the importance of knowledge sharing and experience using ESN increased, the rates of increase of intention to use ESN by employees became greater for knowledge seekers than knowledge contributors.

Nguyen, Malik, and Sharma (2020) examined factors influencing online knowledge sharing among knowledge contributors and knowledge seekers by integrating intrinsic and extrinsic motivation into the TPB in the Vietnamese context. The perception of behaviour is not the problem influencing knowledge contributors' and knowledge seekers' online knowledge

sharing. Instead, online information exchange appears to be entirely under the voluntary control of both user types. Both knowledge providers' and knowledge seekers' intentions to share their information were driven by self-enjoyment (intrinsic factor). Self-efficiency only impacted knowledge contributors, and it was suggested that those with more knowledge confidence had more positive attitudes about online knowledge sharing. In a workplace where everyone collaborates to accomplish shared goals, subjective norms favour employees' intentions to share knowledge online. So, it makes sense that social pressure significantly impacts people's intentions or actions more than attitudes.

However, rewards had a negative influence on knowledge contributors' attitudes on online knowledge sharing. Nguyen, Malik, and Sharma (2020) related the finding to the claim stated by Bock et al (2005) and Amayah (2013). According to Bock et al. (2005) and Amayah (2013), Bonuses, promotions, or job stability are significant advantages that may have a negative effect since individuals who expected to get them would be disappointed if they did not. Moreover, these rewards cannot be offered to everyone; they may cause knowledge contributors to see each other as a competitor, which would be detrimental to their relationship.

Finally, perceived ease or difficulty in performing knowledge sharing behaviour did not affect online knowledge sharing intention in an organisation. Online knowledge sharing within an organisation has grown widespread as information and technology have progressed (Nguyen, Malik, and Sharma, 2020).

According to social exchange theory, staff members are inspired to help others if they foresaw future rewards would outweigh their efforts. As a result, members of social networks must feel that their efforts to contribute knowledge will be valued. Despite those empirical studies (e.g., Nguyen, Malik, and Sharma, 2020) confirmed that the reputation significantly affects the quality of knowledge exchanged. Beck, Pahlke and Seeback (2014) reached the contrary

Findings. The finding was Implied to the inquiry made by knowledge seekers. Knowledge contributors then voluntarily determine the time and effort required to accomplish this knowledge request.

Beck, Pahlke and Seeback (2014) also found that the social network characteristics (e.g., subscription, tagging, rating, or profile picture) significantly influenced that quality of knowledge has been exchanged in the network. As a result, ESNs deliver new ways for knowledge seekers to express their attributes, social status, and social presence; they believe they have access to the knowledge of others.

Knowledge seekers' social presence is a key element in sharing knowledge (Beck, Pahlke, and Seeback, 2014). The more representational behaviour a knowledge seeker takes to establish their social presence in the network, the more confidence, and less ambiguity the knowledge contributor experiences and consequently, the quality of knowledge sharing increases.

Moreover, Beck, Pahlke, and Seeback (2014) found that trust affected knowledge sharing significantly and social network users would perform any reciprocity commitments in future relationships and bind them together, especially in a voluntary setting. At last, Beck, Pahlke, and Seeback (2014) found interesting results about the strength of weak ties in terms of quality of knowledge exchanged over ESNs. Although they could not confirm that solid ties can improve knowledge sharing, the finding implied that strongly tied employees might be informed of their collective knowledge and seek it out more directly, such as through phone or email conversations, instead of using ESNs.

Hung, Lai and Chou (2015) examined factors influencing professional virtual community for knowledge sharing by employing the DTPB in Taiwan. They found that PEOU, perceived compatibality and reciprocity are motivated knowledge seekers' attitude toward knowledge

sharing. Similar to Beck, Pahlke and Seeback's study (2014), Hung, Lai and Chou (2015) found that reputation did not affect knowledge contributors or knowledge seekers' attitudes toward knowledge sharing.

In contary to Nguyen, Malik, and Sharma (2020) findings, Hung, Lai and Chou (2015) found that social norms did not affect attitudes toward knowledge sharing. Peer influence had a greater impact on knowledge seekers and trust had a greater impact on knowledge contributors. Finally, Hung, Lai and Chou (2015) discovered that self-efficiency had a greater influnece on knowledge contributors than knowledge seekers. This result implied that knowledge contributors with higher confidence in their ability to exchange knowledge frequently have strong intrinsic motivation.

Yang, Li and Huang, (2017) examined the influence of perceived online community support and member relations on members' community commitment in a typical education websites in China. This website provides a broad choice of discussion forums, blogging, and other user communication channels facilitating information sharing.

According to Yang, Li, and Huang (2017), a continually improving quality system to encourage member engagement and communication is associated with perceived support for member communication. The offering of services like a chat room, email services, member search services, and events for subscribers are examples of perceived support for communication, resulting in an increased sense of belonging and social relationships among its members. However, there is not statistically difference in between knowledge contributors and knowledge seekers in influencing their commitment to the community.

According to research by Yang, Li, and Huang (2017), giving rewards, building a solid reputation for various active members' efforts, and expressing appropriate gratitude to actively

engaging users all fall under the category of perceived recognition for participation. Furthermore, they found that perceived recognition of involvement had a more significant impact on knowledge seekers' commitment than knowledge contributors.

Perceived speech rights had a more significant influence on knowledge seekers' commitment than knowledge contributors. Perceived speech rights can reveal how much a community supports individuals' freedom to speak a wide range of opinions. Knowledge seekers are seen as essential consumers of a virtual community since they read the online content that knowledge contributors supply. A supportive atmosphere for knowledge contributors to share information, knowledge seekers might more easily locate the appropriate information they seek, and they can be recognised for their contributions and right to free speech.

Yang, Li, and Huang (2017) found that among knowledge seekers, trust positively moderated the impact of commitment and perceived right to speak. As a result, the more decisive influence of perceived free speech in this society on a knowledge seeker's commitment, knowledge seekers have a higher trust in other participants in the virtual community.

The above discussion presents an overview of the value of online knowledge sharing in sustaining organisational competitive advantage between consumptive and contributive users. Common factors discussed above include intrinsic motivators (i.e., reputation and rewards), self-efficiency, self-enjoyment, subjective norm, social pressure, technology characteristics, trust, and. perceived behavioural control.

According to Nguyen, Malik, and Sharma (2020), Beck, Pahlke and Seeback (2014) and Hung, Lai and Chou (2015), reputation and reward do not affect knowledge contributors and knowledge seekers for online knowledge sharing within an organisation in a voluntary context. In contrast, Yang, Li and Huang (2017) reached the contrary result in terms of intrinsic

motivators (i.e., reputation and rewards), which these factors motivate knowledge seekers' commitment to online communities. Self-efficiency affects knowledge contributors for online knowledge sharing in Nguyen, Malik, and Sharma's (2020) and Hung, Lai and Chou's (2015) studies.

The impact of social pressure and subjective norm were contrary to online knowledge sharing. According to Nguyen, Malik, and Sharma (2020), subjective norms and social pressure positively affect knowledge contributors toward online knowledge sharing in organisations. On the contrary, Hung, Lai and Chou (2015) found no impact of subjective norm between two types of users (consumptive and contributive), and social pressure influence knowledge seekers significantly toward online knowledge sharing.

All three studies, Beck, Pahlke and Seeback (2014), Hung, Lai and Chou (2015), and Yang, Li and Huang (2017), found a positive effect of trust for both knowledge seekers and knowledge contributors toward online knowledge sharing. Hung, Lai and Chou (2015), Beck, Pahlke and Seeback (2014), and Yang, Li and Huang (2017) found a positive impact of technology characteristics on knowledge contributors and knowledge seekers' use of knowledge sharing.

Lastly, Nguyen, Malik, and Sharma (2020) and Hung, Lai and Chou (2015) found that perceived behavioural control or facilitating condition (Venkatesh et al., 2003) has a more significant impact on knowledge sharing by knowledge contributors. Hence, this thesis extends the online Knolwedge sharing literature by exploring the factors influencing the use of ESNs in higher education in which the disparities in the motivation of consumptive users and contributive users are also measured. The following section theoretically analyses the key Knowledge sharing factors and the benefits of knowledge sharing within an organisation.

2.5 Knowledge Sharing Factors and Knowledge Sharing Organisational Benefits

There is extensive discussion and research about online knowledge sharing in the commercial world (Al-Busaidi and Olfman, 2017; Kane et al., 2014; Moqbel, Nevo and Kock, 2013; Wehner, Ritter and Leist, 2017). Using ESNs (e.g., Yammer, Microsoft Teams and Slack) is still a new phenomenon. ESNs have not been a fully researched subject, particularly in HEIs (Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Arshad and Akram, 2018; Dermentzi et al., 2016; Donelan, 2016). The bulk of research into using SNSs (e.g., Facebook, Twitter, LinkedIn, wikis and blogs) and e-learning technologies (e.g., Blackboard Learn and Moodle) in the context of teaching and learning (i.e., lecturers and students) has been examined (McCarroll and Curran 2013; Conole and Culver 2010; Koranteng, Wiafe and Kuada, 2019; Menkhoff et al., 2015).

Factors affecting the use of ESN between consumptive users and contributive users in higher education have received a little attention, and there is no theory to guide practice. Some studies (e.g., Maican et al. 2019; Arshad and Akram, 2018; Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Dermentzi et al., 2016; Donelan, 2016; Ortbach and Recker, 2014; Gruzd, Staves and Wilk, 2012) have investigated the impact of ESN on knowledge sharing between academic staff without specifying two types of users.

These studies have chosen either qualitative or quantitative approaches (e.g., interviews and surveys) to investigate factors affecting the use of ESN among academic staff. Such scholars (e.g., Maican et al. 2019; Arshad and Akram, 2018; Al-Daihani, Al-Qallaf and AlSaheeb, 2018) conducted surveys to examine patterns of behaviour regarding the use of ESNs between academic staff in higher education and employed different individual technology use models such as TAM, UTAUT with merging personality traits, the DTPB and the uses and gratifications theory. These scholars explained that the existence models are appropriate for

understanding behaviours and intentions in IT studies and examined the uses of new technologies by individuals.

Other scholars (e.g., Gruzd, Staves and Wilk, 2012) employed UTAUT in semi-unstructured interviews to explore factors affecting the use of ESN by providing an environment enabling rich description that would otherwise be missed if academic staff were asked to answer more forced choice questions (i.e., closed ended questions). These scholars explained that adopting UTAUT in a qualitative study could explain why academic staff are more or less likely to adopt and use a particular information technology. This research suggests that a pluralistic approach or mixed methods could provide a complete picture than a qualitative or quantitative approach alone.

This research started in January 2017 and ended June 2020. The extended UTAUT was used as a useful organisational theoretical lens for investigating the drivers driving consumptive and contributive ESN use in higher education. UTAUT has been identified as a reliable tool for assessing individual technology-level usage (Wang et al., 2014). Many scholars have employed UTAUT to understand the behavioural purposes of using PSNSs among academic staff and students (Kaba and Touré, 2014; Salahshour Rad et al., 2019), including Web 2.0 applications (ESNs and blogs) among employees within enterprises (Wang et al., 2014). Dwivedi et al. (2019) suggested that the UTAUT, which has subsequently been applied widely by researchers in their hunt to explain IS acceptance and use, can be a helpful organisational tool in identifying the drivers of new technology use in a company to create efficient involvements. However, there is a clear sign of disparities in results when UTAUT has been used in different research settings to study behaviour intention and technology adoption. Therefore, there is a need for further duplication.

Other studies (Chin et al., 2020; Cleveland, 2016) found that other drivers such as content value, feature value and relationship expectancy also come into play when social networks are employed for knowledge sharing. They found that these factors may raise the staff's consumptive and contributive use. However, Cleveland (2016) did not develop an instrument (i.e., survey) to measure the study's factors, he left it incomplete. He suggested that alternative characteristics might impact community knowledge formation practices differently (Cleveland, 2016).

Since higher education communities often invest in online sharing infrastructures, they want to understand the effectiveness of their investment (Kwahk and Park, 2016). As a result, it becomes important to examine the benefits of organisational online knowledge sharing. Earlier studies (Gruzd, Staves and Wilk, 2012; Zhao and Rosson, 2009; Ritcher and Riemer, 2013; Penni, 2017) reveal that these platforms enable staff to build relationships and person perception with other networks. The following sections discuss factors influencing online knowledge sharing in detail.

2.5.1 Determinants of the Online Knowledge Sharing Process

Over the last few decades, scholars from IS research have proposed and employed various IT and IS theories to understand individual acceptance and use of IS (Venkatesh et al., 2003). Dwivedi et al. (2019) described these theories as consisting of the theory of reasoned action (TRA) (Ajzen and Fishbein, 1975), the TAM (Davis, 1989), the Motivational Model (MM) (Davis, Bagozzi and Warshaw, 1992), the TPB (Ajzen, 1991), a combination of TAM/TPB (C-TAM-TBP), TAM 2 (Venkatesh and Davis, 2000) and the DTPB (Taylor and Todd, 1995), the IS success model (DeLone and McLean, 1992), innovation diffusion theory (IDT) (Rogers, 1995 cited in Weerasinghe and Hindagolla, 2018, p.143) and social cognitive theory (SCT) (Bandura, 1986), and the model of personal computer utilisation (MPCU) (Thompson, Higgins

and Howell, 1991). The TAM was designed to predict IT acceptance and usage on the job. The TAM eliminates the attitude construct to justify intention parsimoniously. Davis (1989) introduced TAM, which consists of perceived usefulness and PEOU constructs. TAM2 (Venkatesh and Davis, 2000) incorporates additional theoretical constructs (subjective norm, voluntariness, and image). However, the mixed findings in Hartwick and Barki (1994, cited in Venkatesh and Davis, 2000, p.188) revealed that subjective norms did not significantly impact intention in a voluntary setting.

Perceived usefulness refers to "the degree to which an individual believes that using a particular system would enhance his or her job performance." (Davis, 1989, p.26). PEOU refers to "the degree to which an individual believes that using a particular system would be free of physical and mental effort." (Davis, 1989, p.26). TAM is supported by substantial empirical studies (e.g., Lane and Coleman, 2012; Lorenzo-Romero, Constantinides and Alarcón-del-Amo, 2011; Rauniar et al., 2014) to be robust and reliable in estimating individual acceptance and adoption of social media tools through varied research contexts.

UTAUT was developed using conceptual and empirical commonalities across the eight models (Venkatesh et al., 2003). The results from the original study by Venkatesh et al. (2003) indicate that UTAUT justifies 69% of variance compared to the eight individual models that explain between 17% and 53% of the variance. Many scholars (e.g., Maruping et al., 2017; Wang et al., 2014; Williams, Rana and Dwivedi, 2015) with various research targets and topics of interest have performed UTAUT studies by applying a range of research methods in various environments, with numerous constructs being integrated into the original theory or blended with other theoretical models. They considered a beneficial tool in identifying the drivers of new technology use in organisations to create efficient engagement. The UTAUT theory comprises four main paradigms, namely performance expectancy, effort expectancy, social

influence and facilitating conditions, which regularly cooperate with other related effects such as gender, age, experience, and voluntariness of use to impact usage intention in implementing an information system (Dwivedi et al., 2019).

When it comes to online knowledge sharing, performance expectancy and effort expectancy have been identified as two critical factors for intention behaviour to use any technology in both mandatory and voluntary settings (Venkatesh et al., 2003). According to Venkatesh et al. (2003, p. 447), performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her attain gains in job performance". Performance expectancy has been developed from five constructs from perceived usefulness in the TAM, C-TAM-TBP, extrinsic motivation in the MM, job fit in the MPCU, relative advantage in IDT and outcome expectations in SCT (Venkatesh et al., 2003). Performance expectancy is a crucial factor in the work-related environment (Chin et al., 2020; Wang et al., 2014; Maruping et al., 2017). Quadri and Garaba (2019), Gruzd, Staves and Wilk (2012), Alotaibi, Crowder and Wills (2017), and Maita et al. (2018) reached to the same conclusion that performance expectations that focus on task achievement are positively associated with social media use among academic staff in higher education. Academic staff are more likely to use social media for exchanging knowledge if it is more beneficial for their work-related tasks (Alotaibi, Crowder and Wills, 2017; Gruzd, Staves and Wilk, 2012; Arshad and Akram, 2018; Nistor, Baltes and Schustek, 2012).

The top two benefits were forming new connections and strengthening existing relationships amongst research staff by using social media tools as a part of their work routine (Gruzd, Staves and Wilk, 2012; Arshad and Akram, 2018). Furthermore, Nistor, Baltes and Schustek (2012) found that academic staff kept up to date with the field's progression and promote their work to peers. While performance expectancy is a crucial determinant for work-environment for not

only academic staff in higher education but also this factor is a crucial determinant in commercial setting. Wang et al. (2014), Kuciapski (2017), Al-Azizi, Al-Badi and Al-Zrafi (2018) discovered that performance expectancy was positively associated with using social media and mobile technologies for knowledge transfer among employees within public and private firms worldwide. In a study by Etemadi et al. (2020), performance expectancy had the most substantial influence on the intention to use social media for knowledge sharing. Kalra and Baral (2020) found similar findings that performance expectancy affected the usage of ESN for knowledge sharing through behavioural intention.

Venkatesh et al. (2003, p. 450) defined effort expectancy as "the degree of ease associated with the use of the system". Effort expectancy includes PEOU in the TAM, complexity in the MPCU and ease of use (EOU) in IDT. Effort expectancy has been found to be a strong determinant in technology adoption and use in both voluntary and mandatory settings. However, Koenig-Lewis et al. (2015) claimed that effort expectancy becomes insignificant over periods of constant usage of technology (e.g., mobile commerce and online customer behaviour).

Kuciapski (2017) found that the level of effort employees needed to use mobile technologies did not impact employees' decision to adopt mobile technologies for knowledge sharing. Baptista and Oliveira (2015) found that effort expectancy had a moderate impact on behavioural intention to use mobile technologies, and they added that users found mobile banking easy to use, expected few problems, and adapted to it very quickly. In addition, Etemadi et al. (2020) and Papadopoulos, Stamati and Nopparuch (2013) also found that effort expectancy did not influence the intention to use social media for knowledge sharing between employees.

Rahi, Abd.Ghani and Ngah (2019) found that effort expectancy influence positively to adopt internet banking setting. Effort expectancy has a significant and mediating effect on customers'

intention focusing Internet banking from commercial banks. However, Zhou, Lu and Wang (2010) illustrated that using Internet banking does not involve too much effort once customers have found the technology is easy to use. As the outcomes in different areas are the same, effort expectancy is found to be a critical factor in social network use for academic staff (Quadri and Garaba, 2019; Alotaibi, Crowder and Wills, 2017). Gruzd, Staves, and Wilk (2012) found that effort expectation negatively influenced the intention to use technology due to privacy concerns, challenges maintaining personal and professional relationships, and worry about losing control over the material posted on social media. Their findings revealed that academic staff motivations to use social networks in higher education still require considerable learning and constant correction of expected effort.

Venkatesh et al. (2003, P. 451) defined social influence as "the degree to which an individual perceives that important other believe he or she should use the new system". Social influence is defined as a subjective norm in TRA, the TPB, the C-TAM-TBP and social factors in the MPCU and image in IDT. According to Jolaee et al. (2014, p. 417), subjective norm exposes "participant perceptions of whether the behavior is accepted, encouraged, and implemented by the participant's circle of influence". Social pressure or subjective norm has been found to be an influential factor for knowledge distribution and they have been examined in various settings, among employees, IT managers and leaders (Gruzd, Staves and Wilk, 2012; Isaac et al., 2019; Kalra and Baral, 2020).

According to Gruzd, Staves, and Wilk (2012), academic staff members can be persuaded to use social media by various sources, including students, peers at other institutions, senior staff and admin staff at their institution, non-academic friends and family members, and even students. In contrast, other studies claimed that unlike performance expectancy and effort expectancy, social influence is not significant in voluntary settings and this factor becomes

important once technology use is required (Venkatesh et al., 2003; Chin et al., 2020). Evaristo (1998, cited in Jolaee et al., 2014, p. 417) subjective norms become less important in regard to use a system over normalization and training impacts. Fullwood, Rowley and Delbridge (2013) suggest that a leader of a team could enhance the ability of the team regarding knowledge sharing and providing good contents for knowledge management systems.

Facilitating conditions refers to "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p.453). Facilitating conditions is defined in three constructs from the TPB, the C-TAM-TBP, the MPCU and IDT including perceived behavioural control, facilitating conditions and compatibility (Venkatesh et al., 2003). The ideas of perceived behavioral control (TPB/DTPB, C-TAM-TBP), facilitating conditions (MPCU), and compatibility are all included in this concept. Perceived behavioural control resulting in training is also significant in both mandatory and voluntary settings.

Available resources, adequate knowledge, and an available help desk for support positively influence academic staff to use and adopt a KMS for teaching and learning. While Wang et al. (2014) and Gruzd, Staves and Wilk, (2012) perceived that facilitating conditions had a negative influence on staff' use for knowledge sharing in higher education and consulting firms in voluntarily environment. These results arise from inadequate knowledge about the technology and low-level technical support, learning and training and participating in voluntarily environment. Koch, Leidner and Gonzalez (2013) proposed three policy-based, socialisation-based and leadership-based techniques for helping employees share knowledge on SNSs and fostering collaboration. In these processes, an organisation integrates SNSs into staff performance targets, promotes knowledge sharing, arranges events to build a relationship among staff, and provides an awareness programme.

Information value relates to information quality (DeLone and McLean, 1992) and perceived output quality (Bock, Sabherwal and Qian, 2008). DeLone and McLean (1992, p. 62) define information quality as "the information product for desired characteristics such as accuracy, meaningfulness and timeliness". Bock, Sabherwal and Qian (2008, p. 538) defined perceived output quality as "the quality of the output that is available from the knowledge reciprocity systems to the specific user".

Several studies (Aladwani, 2017; Zheng, Zhao and Stylianou, 2013; Xu, Benbasat and Cenfetelli, 2013) examined individual attitudes toward information shared on social media and they found that the perception of information value may have a discrepancy influence on diverse types of social network use. Aladwani (2017) considered information quality as an important component in general idea of website quality as "users' evaluation of website's features meeting users' needs and reflecting overall excellence of the web site" (Aladwani and Palvia, 2002, p.469). Information quality includes the reasons why individuals consume the material, the attributes of the content, and the skills of each user. For instance, Zheng, Zhao and Stylianou (2013, p. 516) defined perceived information quality as "an individual's evaluation of the system's performance in providing information based on his experience of using the system". Relevant and valuable information for employees could enhance their understanding and decision-making (Zheng, Zhao and Stylianou, 2013).

In contrast, low content quality from unreliable sources could waste employees' time and effort in reading meaningless information (Zheng, Zhao and Stylianou, 2013). Morris et al. (2012) advised that the use of non-standard grammar and spelling decreased the credibility of contributors. When the information shared on the platform is relevant and valuable for employees' needs, both knowledge seekers and knowledge providers can benefit from it. Consumptive users who wish to learn more about a subject and get advice benefit from high-

quality content, as do contributive users who provide knowledge. For instance, by giving valuable work-related information, a contributive user can assist more individuals in need and improve their reputation and self-image in the community (Zheng, Zhao and Stylianou, 2013).

The term "feature value" refers to the important characteristics of social networks that can help users locate and share content more easily and quickly. ESN is accessible from any location or device connected to the network (Qi and Chau, 2018). Giving social network users such unlimited access enables them to communicate with others by instantly sharing knowledge in relation to meeting information demands (Qi and Chau, 2018). Knowledge, according to the information hunting idea, is frequently buried in online documents or people's minds. As a result, knowledge seekers strive to gather information in such environments, and they must commit a certain amount of time and effort to find the necessary information (Cleveland, 2016). Pirolli and Card (1999, cited in Cleveland, 2016, p.5) suggested that any method that reduces the researcher's work and time spent locating data while increasing the attainment of real-worth information would be their chosen primary route. The greater pervasiveness of social networks will enable knowledge seekers to access information sources or knowledge objects without putting in more effort than is expected to look for individual books.

In the study by DiMicco et al. (2009), social network users felt "closer" to one another because of the profile information, formed more multidimensional impressions of each other, and facilitated greater group cohesion. Ellison, Steinfield and Lampe (2007) discovered that social network profile information in a non-organisational environment can operate as a social activity, allowing people to discover mutual understanding with others, improving mutual trust and promoting connection. Therefore, knowledge seekers can make a judgement about a source's authenticity and expertise within a public knowledge area by studying the source's profile (including an analysis of the source's published material) (Morris et al., 2012). As

contributive users' postings are published in chronological order, consumptive users may put together such a story by scrolling through the timeline and reading the contributive users' posts.

The reliability of information sources has an influence on knowledge exchange behaviours in organisations (Morris et al., 2012; DiMicco et al., 2009). Quigley et al. (2007) found that consumptive users are more enthusiastic about seeking information if contributive users are viewed as trusted experts. Therefore, consumptive users experience a better perception of connectedness, shared unity, and loyalty to a common cause with such experts (Quigley et al., 2007; Zheng, Zhao and Stylianou, 2013). Müller and Stocker (2011) examined consumptive users' behaviour in using Yammer, and they found that consumptive users were willing to collect essential information by easily subscribing with expertise. They were able to understand guidelines for specific market difficulties, as well as being informed on the most current practices, guidelines and safety (Müller and Stocker, 2011; Chin, Evans and Choo, 2015).

Accuracy, availability, usefulness, punctuality, completeness, and coherence are all characteristics of high-quality information (Yoo, Vonderembse and Ragu-Nathan, 2011). When information appears to have value and may have benefits, employees are eager to invest time and effort in pursuing it. For example, Kankanhalli, Lee and Lim (2011) discovered a link between information reuse and information quality from using Twitter by conducting 114 survey questionnaires among customer service officers in multi-national banks. Therefore, the higher the quality of information, the quicker staff respond to customer demand and the less time spent on new regular training, and the result is superior customer service (Kankanhalli, Lee and Lim, 2011).

Finally, tagging is an effective social network feature that allows users to organise their information by labelling certain terms for quick access by others (Panahi, Watson and Partridge, 2016 a, 2016 b). ESN users can employ tagging keywords to link and categorise

their message's content with specific topics (Panahi, Watson and Partridge, 2016 a, 2016 b). Chin et al. (2020) recommended that labelling improves users' chances of discovering and retrieving new information.

Relationship expectancy is defined as the level of individuals' belief in initiating and sustaining relationships with other employees with the help of using an ESN inside the organisation (Chin et al., 2020). DiMicco et al. (2009) and Zhao and Rosson (2009) discovered how social networks have been used for initiating and maintaining relationships between employees. Zhao and Rosson (2009) examined Twitter as a popular public social network tool with potential impacts on knowledge sharing at work. Twitter has become an informal communication channel for increasing knowledge sharing, building relationships and developing a common ground at work. Premkumar and Bhattacherjee (2008) added that PSNSs were primarily designed to fulfil users' emotional desires and ESNs were designed to fulfil their cognitive desires. All types of social networks, whether public social networks or private social networks, allow individuals to build a relationship for work-related purposes (i.e., task-related guidance, ideas) within organisations or non-work-related purposes outside.

According to Grieve et al. (2013) findings, PSNSs use may offer the chance to establish and sustain social connections in an online setting, and these connections are linked to fewer cases of depression and anxiety as well as higher levels of life satisfaction. Chin, Evans and Choo (2015) and Ritcher and Riemer (2013) reached the same results in the workplace: ESNs allow employees to grow their network ties and get to know individuals better. The visible profiles in a social network allow individuals to connect with expertise and check individuals' current and past projects (Chin et al., 2020). The openness of weak ties in a social network can provide new and diverse information to a company, promote knowledge dissemination, transfer, and co-production among knowledge users, and improve productivity (Wu et al., 2020).

2.6 Hypotheses Development

2.6.1 Performance Expectancy

Performance expectancy refers to the degree to which academics believe that using an ESN would help them access research opportunities and research accomplishments such as funding and productivity in their research (Donelan, 2016; Gruzd, Staves and Wilk, 2012). Individuals assess their technology-facilitated job performances in terms of the related benefits (i.e., acceleration of efficiency, success, and productivity in research performance) and costs (i.e., mental, behavioural and time investments received for research assignments) (Salahshour Rad et al., 2019). Therefore, if the benefits of effort are high and the cost is low, the practical value of the technology is superior, and the intention to use such technology is positive for both consumptive and contributive use. A recent study by Gruzd, Staves and Wilk (2012) found the top two benefits, namely forming new connections and strengthening existing relationships amongst research staff by using social media tools as a part of their work routine. Alotaibi, Crowder and Wills (2017) suggested that a web-based Knolwedge sharing system enables academic staff to find professionals across the university. They emphasised that academic staff found social networks more beneficial than traditional methods (e.g., telephone and email). In contrast, Gruzd, Staves and Wilk (2012) argued that social networks (e.g., Facebook, ResearchGate, LinkedIn) could indirectly influence their scholars' careers.

Building new connections and finding new collaborators for their research have been identified as two top reasons for using social media among academic staff. However, this thesis argues that using ESNs impacts directly on academic staff career progression. An empirical investigation in South Korea from IT users in fifteen large firms by Kim, Jahng and Lee (2007) revealed that performance expectancy was shown to be positively significant to IT utilisation. Performance expectancy was measured by four items, including the time needed for

completing tasks, the quality of output, the effectiveness of performing job-related duties and the production quantity (Venkatesh et al., 2003). Performance expectancy played an insignificant role in predicting social media's behavioural and adoption intentions in small business use (Mandal and McQueen, 2012). On the other hand, performance expectancy has usually been known as a critical factor for intention behaviour to use any technology in both mandatory and voluntary settings (Kuciapski, 2017). But also, knowledge sharing is important not just for efficiency, competitiveness, and organisational knowledge (Laycock, 2005), but also for crisis management and emergency aid (Zhang, Zhou and Nunamaker Jr., 2002). Given the weight of evidence showing the prominent role that performance expectancy can play in influencing an individual's behaviour and intention to use social media tools, this study posits that:

H1a Performance expectancy has a positive impact on consumptive ESN use.

H1b Performance expectancy has a positive impact on contributive ESN use.

2.6.2 Effort Expectancy

Effort expectancy in this study implies the ease with which academics use ESNs in their work practices. Specifically, this includes EOU, clarity and familiarity with ESN platforms. Since most workers have used publicly available social media (e.g., Facebook, Twitter, and LinkedIn), this factor has been found to be less critical as individuals get to know the technology (Baptista and Oliveira, 2015; Mandal and McQueen, 2012). PEOU from the TAM, a concept like effort expectancy in UTAUT, was the second-most common antecedent of behavioural intention but primarily generated non-significant results (Koenig-Lewis et al., 2015; Phonthanukitithaworn, Sellitto and Fong, 2015). Effort expectancy has been identified as a motivational aspect of online communication and collaboration among academic staff (Maican et al., 2019).

Gruzd, Steves, and Wilk (2012) argued that academic staff were less concerned about the ease of learning social networking but expressed concerns about maintaining and following the continuously changing features, functionalities and control policies appearing on the several social media devices. Further, they claimed that other challenges such as mastering various social media tools and privacy concerns would fade via a regular assessment and improve social media tools. In contrast, Alshahrani and Pennington (2018) found that practice and experience are the two main elements in using social media tools among researchers. Researchers are less confident about sharing knowledge on social media tools due to their lack of practice and experience (Alshahrani and Pennington, 2018). However, the effect of effort expectancy on using ESNs among academic staff has not been established in the literature. Effort expectancy reflects how effortlessly academic staff can manage to access and use ESNs without taking up much time. Thus, the less effort academic staff put in, in terms of ease of access and reading, stating, posting posts, uploading, or downloading files from the platform, the more the number of consumptive and contributive ESN users will increase. Thus, this study proposes that:

H2a Effort expectancy has a negative impact on consumptive ESN use.

H2b Effort expectancy has a negative impact on contributive ESN use.

2.6.3 Social Influence

In this study, social influence is defined as academic staff believing that a significant person influences their use of technology, such as a Dean, the Head of Department, and colleagues. Existing literature indicates that social influence has been chiefly examined from a socio-psychological perspective (Ngai, Tao and Moon, 2015). Grant and Preston (2019, p. 626) defined it as its "effect on group or individual attitudes and intentions towards a certain behaviour". This aspect refers to the impact of directly felt expectations from other people

(Cheung, Chiu and Lee, 2011). Studies like those by Tsai and Bagozzi (2014), Gruzd, Staves and Wilk (2012), Wang and Lin (2011) and Qin et al. (2011) perceived social influence as a vital driver for knowledge sharing within different industries.

In contrast, Herrero, San Martín and Garcia-De los Salmones (2017) argued that social influence is insignificant in using SNSs to share information among employees. Since using SNSs to communicate customer content about tourism is relatively positive, it would not impede the behavioural intention to use SNSs; it also would not promote it (Herrero, San Martín and Garcia-De los Salmones, 2017). Kelman (1958) Believed that an individual's attitudes, actions and behaviours are influenced by others through three stages, namely compliance (subjective norms), identification (social identity) and internalization (group norms. Compliance occurs when an individual embraces influence and adopts behaviors that are triggered for reward and approval. Identification occurs when an individual maintains desirable and beneficial relationships with others or groups. Internalisation occurs when an individual accepts influence when the content of the prompted attitude is rewarded. Others' opinions and actions are reflected in the content. Individuals engage in prompted behaviours because they recognize that they are aware of the values.

The study by Wang and Lin (2011) reveals that compliance is very significant as users with low use experience will benefit from valuable information for usage decisions from their key reference parties such as friends and the effect of expectations from others. Tsai and Bagozzi (2014) study reveals that the unity of one's goals with those of other group users (internalization) and a sense of social identity led to community participation. Therefore, compliance is inconsequential since users' involvement is voluntary and consumptive users can remain anonymous, and they do not need to satisfy other expectations. Moreover, according to earlier studies, academic staff use Yammer voluntarily. Therefore, social

behaviour theories are frequently employed to study users' attitudes, intentions and actions concerning social media adoption or engagement, either as antecedents to, or moderators of, usage and knowledge sharing. Therefore, this study postulates that:

H3a Social influence has a positive impact on consumptive ESN use.

H3b Social influence has a positive impact on contributive ESN use.

2.6.4 Facilitating Conditions

Facilitating conditions in this study refer to the academic staff's perception of the resources and support available to achieve a behaviour. Facilitating conditions comprising technical and structural elements prearranged to abolish barriers to using ESNs within higher education. Universities have to know adequately about ESN and provide resources such as technical support, education and training and rewards systems that support the use of technology negatively impact the behavior of individual users. Fullwood and Rowley (2017) emphasised that top management support and different leadership style (i.e., academic leadership and managerial leadership) for knowledge sharing are crucial in increasing the degree of sharing among academic staff. The association between facilitating conditions and social media behavioural intention and use behaviour has been confirmed in commercial settings (Workman, 2014) and academia (Alshahrani and Pennington, 2018; Gruzd, Staves and Wilk, 2012) along with customer behavioural intention towards digital payment systems (Morosan and DeFranco, 2016). However, Mandal and McQueen (2012) claimed that facilitating conditions were not significant for small corporate holders. Patil et al. (2020) said that this relationship's significance in the study describes the need for resources, and technical and legal support for customers for using payment systems. Therefore, users utilise (consume and contribute) the platform if universities provide ongoing awareness activities and events on the forum, along with trainings and education for academic staff. Hence, this study suggests that:

H4a Facilitating conditions have a positive impact on consumptive ESN use.

H4b Facilitating conditions have a positive impact on contributive ESN use.

2.6.5 Information Value

Information value is close to the content value of Chin et al. (2020), who defined it as "the degree to which the resources available in a network provide benefits for the individual". There are similarities with the information quality of DeLone and McLean (1992, p. 62), who defined it as "the information product for desired characteristics such as accuracy, meaningfulness, and timeliness". There is also a similarity with the perceived output quality of Bock, Sabherwal and Qian (2008, p. 538), who defined "the quality of the output that is available from the knowledge reciprocity systems to the specific user". However, my definition in this research refers to the relevance of information, how up to date the information is, how the created information is useful to the user and how the information shared is engaging in terms of content style. The definition was created from the key terms mentioned by participants in the focus group earlier. Bock, Sabherwal and Qian (2008, p. 538) used the term "perceived output quality" instead of knowledge content quality or information quality. Bock and his colleagues (2008) demonstrated that "output quality" has been utilised in the TAM and they included "perceived" because individual users could be different in their evaluations of the output quality of the same platform (Bock, Sabherwal and Qian, 2008, p.538). The communication style and work-related content of staff's work impact the use of ESNs (Ransbotham, Kane and Lurie, 2012). Moreover, they mentioned that the higher the "content value", the more it is expected to provide an individual user with the required information or knowledge. Therefore, this research hypothesised that the higher relevancy of information in terms of work-related, up-to- date and engaging (informal language style), the higher number of users consume from

the platform. When information is of high quality, there is less need for contributions to the platform. Therefore, the study suggests that:

H5a Information value will positively impact consumptive ESN use.

H5b Information value will negatively impact contributive ESN use.

2.6.6 Feature Value

This research defines feature value as the critical features of an ESN that could help users to find and share information more easily and quickly. Cleveland (2016) explored seven crucial microblogging features and draws upon seven suggestions that facilitate knowledge generation among employees within a shared knowledge domain. The key features are pervasiveness, brevity, knowledge source profile, subscription, reposting, directed communication and tagging. However, this thesis argues that Cleveland's (2016) study exploring the seven crucial factors demonstrates how Twitter specifically can enable knowledge creation among employees. The feature called "brevity" refers to restraining the textual quantity of the user's messages. The Twitter platform restricts posts to 140 characters. Cleveland (2016) claimed that this restraint reduces the user's effort and increases the frequency of content posted on Twitter.

However, ESNs are not restricted in terms of the textual quantity of users' messages. Therefore, the other features, namely pervasiveness, knowledge source profile, subscription, reposting, directed communication and tagging, are critical in assessing social network usage.

Beck, Pahlke and Seebach (2014) proposed a social status aspect of knowledge sharing. Social status refers "to a person's position of interpersonal influence and elevated standing in a group and increase for people who possess certain attributes (e.g., competence or knowledge) valued by the members of a collective" (Beck, Pahlke and Seebach, 2014, p.1251). Social exchange behaviour, such as providing and obtaining help, can give social status because people are

expected to be held in higher esteem if they begin to offer better support than others (Flynn et al., 2006). Beck, Pahlke and Seebach (2014) measured a knowledge seeker's social status in the network according to the quality of his or her prior contributions (number of reshared messages, and message quality measured by users via "like" and "tagging" features) on the platform. Beck, Pahlke and Seebach (2014) claimed that the higher a knowledge hunter's social status in the network, the greater the knowledge shared on the social network platform.

According to Morris et al. (2012), individuals can create a user profile, including a profile picture, a short biography and source location on an ESN platform. While knowledge contributors share messages on a forum, knowledge hunters can put all messages together by scrolling through a timeline and can create a perception of knowledge contributors from a shared information domain by reviewing the source's profile (Cabrera and Cabrera, 2005; Zhao and Rosson, 2009). Morris et al. (2012) suggests that if the perception of a knowledge source is one of reduced credibility, this may be due to non-standard grammar, no profile picture and a low number of followers. The credibility of sources improves once a knowledge provider or writer has influenced the number of followers, number of posts, number of mentions, and the relevant skill and standing they have exhibited. A hashtag feature allows users to organise their content by tagging it with specific keywords for easy retrieval by others (Panahi, Watson and Partridge, 2016 a, 2016 b). These aforementioned studies argued that social network features enable employees to contribute and seek information more quickly and easily. Earlier in the focus group, participants emphasized how the critical features of an ESN could help them to find information more easily (i.e., hashtags), trace audiences and find a person to make contact with (e.g., Seen By, View Insight groups), and share information and files in a timely manner. Therefore, these features were seen as core values in using ESNs within universities. Gruzd, Staves and Wilk (2012) stated that academic staff were concerned about maintaining and following the continuously changing features, functionalities and control policy appearing on

the several social media devices. These concerns may impact ESN (e.g., Yammer, MS Teams) since Microsoft constantly updates its products' features. Therefore, this study suggests that:

H6a Feature value has a positive impact on consumptive ESN use.

H6b Feature value has a positive impact on contributive ESN use.

2.6.7 Relationship Expectancy

Relationship expectancy is defined as the degree to which a member of academic staff assumes that using an ESN leads to the growth of new relationships and the maintenance of existing relationships with other academic staff within the university. This construct has a close relation with relationship expectancy from Chin et al.'s (2020) study. Ritcher and Riemer (2013) said that an ESN is created to provide vital services to enable network ties inside the enterprise, such as building person perception (Zhao and Rosson, 2009) and forming new professional relationships (Salahshour Rad et al., 2019). In the study by Levin and Cross (2004), connections are the fundamental basis for obtaining knowledge, asking questions, and resolving issues between knowledge seekers and knowledge contributors. Informal interaction may lead to feelings of affection and connectedness among teammates (Weerasinghe and Hindagolla, 2018; Zhao and Rosson, 2009). Therefore, this positive emotional feeling among individuals is crucial for future communications and cooperation. Penni (2017) demonstrates that social network use is precious for young adults because of the sociable personalities that allow them to retain relationships with several people. Kent (2008, p. 37) supports the notion that blogs produce organisational benefits such as "issue framing, relationship building, fostering trust and identification". In this study, relationship expectancy is considered a predictor of ESN use. This study posits that:

H7a Relationship expectancy has a positive impact on consumptive ESN use.

H7b Relationship expectancy has a positive impact on contributive ESN use.

2.6.8 Professional Benefits

ESNs provide a variety of opportunities for collaboration, such as improving knowledge sharing and experiencing a feeling of connectedness among staff in academic and non-academic settings (Turban, Bolloju and Liang, 2011; Pitafi et al., 2020). Zhao and Rosson's (2009) study showed that microblogging in a commercial setting made a new informal network for communication at work, facilitating professional benefits (developing a common ground, constructing relationships, building person perception) and benefiting individuals. Ramayah, Yeap and Ignatius (2013) classified knowledge sharing into four classes: providing knowledge through the publication of journal articles, taking part in official communications such as meetings or workshops, getting involved in informal communications and working together with groups of researchers.

Subsequently. Ramayah, Yeap and Ignatius (2013) added that improving performance in decision-making and organising and obtaining rewards (e.g., career promotion and salary increase) are underlined as advantages of sharing knowledge among scholars. Fullwood and Rowley (2017) argued that intrinsic benefits (e.g., improved relationships with other academics by joining conferences, workshops, and brokerage events) promote Knolwedge sharing actions. This is consistent with Bock et al.'s (2005) conclusions on the positive relationship between knowledge sharing and reciprocal relationships. Therefore, this thesis claims that universities have embraced ESNs to promote increasing quantities of official interaction (e.g., conferences, workshops) and informal interaction (e.g., social events) among academic staff for networking and future collaboration.

On the other hand, there should be a healthy balance in using ESNs between knowledge seekers and knowledge contributors unless the platform becomes unsustainable (Chin et al., 2020). The literature has emphasised the importance of balanced, reciprocal technology use when the technology involves two-way interaction among users (consumptive users and contributive users) (Wang et al., 2014). Therefore, it is essential to measure the benefits gained by consumptive users. This research predicts that knowledge-seeking users will benefit from being updated on the latest academic work programme opportunities, participating in educational workshops, and applying for and receiving a research grant. Thus, this study proposes that:

H8 The higher the consumption of the consumptive ESN, the greater the professional benefits that will be received.

In summary, in this study, to answer study questions 3 and 4, It was suggested that the extended UTAUT positively impacts consumptive use of enterprise social networks and contributive use of enterprise social networks for communication and collaboration to obtain funding opportunities. In light of this, figure 2.1 presents the extended UTAUT conceptual framework for online knowledge.

2.6.9 The Conceptual Research Model (the Extended UTAUT Model)

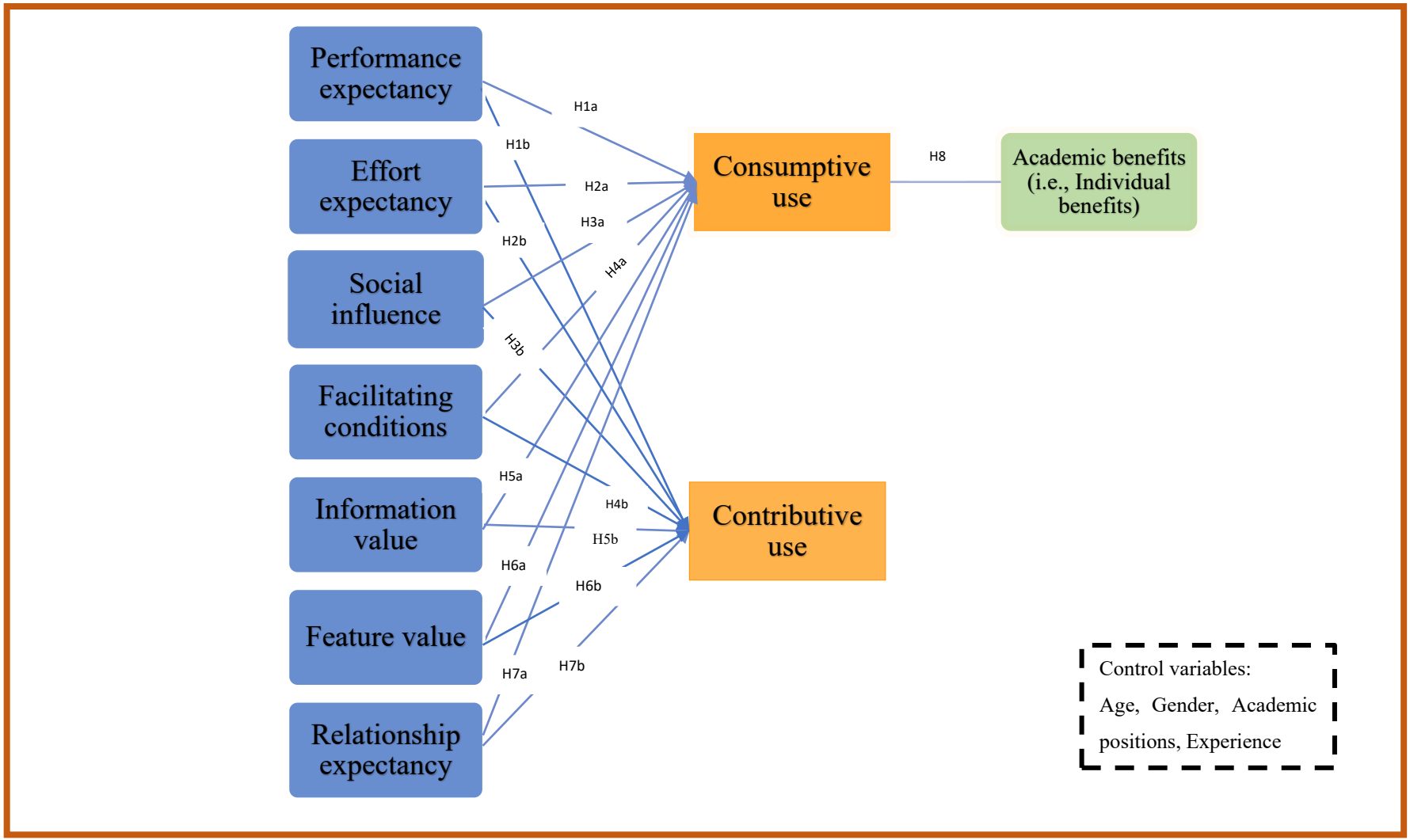

Figure 2. 1 The conceptual research model (the extended UTAUT)

Chapter Three: Methodology

Chapter Three: Methodology

3.1 Introduction

The methodology chapter explains the main methodological foundations and research design of the current thesis. This chapter explains and discusses the main steps used in constructing the extended UTAUT model, from the data collection to analysis stage.

Firstly, it presents the justification for the research methodology, the importance of case studies in critical realism and the relationship between grounded theory and critical realism.

Secondly, it presents an overview of the data collection process in terms of data types and resources in this thesis.

Thirdly, the chapter explains the data analysis techniques in terms of data types, using statistical methods and packages, including the theoretical background behind each method.

Finally, the primary ethical considerations related to this study are explained.

3.2 Justification of the Research Methodology

3.2.1 A Comparison of Key Philosophical Perspectives

One of the key issues in social and behavioural sciences research is the value of different research methods, particularly with intense arguments on diverse epistemologies (e.g., positivism versus interpretivism) and methodologies (e.g., qualitative versus quantitative) (Ortega, 2005). There have been growing calls to go beyond epistemological and methodological differences to advance a controlled methodological pluralism (Ortega, 2005),

because insufficient research has employed methodological pluralism in the information systems literature (Tsang, 2014).

A paradigm is a critical set of beliefs that mirror researcher views and help other readers to understand the phenomenon (Venkatesh *et al.*, 2003). Paradigms guide the structure and nature of questions and are so embedded that they are not usually studied in any respect (Venkatesh *et al.*, 2003). Regardless of the approach, the paradigm will thus affect the methodology, ultimately affecting the choice of method for a study (Venkatesh *et al.*, 2003). Because researchers typically adopt either a quantitative or qualitative approach, many researchers have come to the conclusion that these methodologies are fundamentally completely opposite (Wiggins, 2011). Each approach is thus regarded as having a separate epistemology, ontology, and axiology (Wiggins, 2011). Positivism and interpretivism dominate IS research, while there is relatively little critical realism. Ontological, epistemological, and methodological assumptions are distinct assumptions regarding positivism, interpretivism and critical realism (Tsang, 2014).

Positivists suppose that reality exists objectively and separately from human experiences, whilst interpretivists point out the subjective sense of the constructed and reconstructed reality through a human and social interaction process (Venkatesh *et al.*, 2003). Epistemologically, positivists are concerned with the hypothetic deductive testability of theories (Venkatesh *et al.*, 2003). Scientific researchers should therefore agree to authentication or disapproval and seek generalisable results. Methodologically, positivists argue that in order to test a hypothetic-deductive theory, research should take a value-free position and employ objective measurement to collect research evidence. A quantitative method, such as a survey, is a typical positivist instrument.

According to the positivist perspective, the primary usage of theory is to anticipate patterns rooted in objective findings because causation cannot be confirmed. Theory testing from positivist perspective, examines observational data to determine whether 1) observations support a prior hypothesis; and 2) this correlation is systematic and cannot be reasonably explained by accidental causes alone (the null hypothesis) (Johnston and Smith, 2010).

The link between evidence and hypotheses defined in theory is what the construct validity notion means to the empiricist. For instance, positivists examine the correlation between the data obtained and one or more factors considered to be correlated to the desired construct. Establishing internal validity is to demonstrate a constant conjunction between the empirical events identified as patterns. It requires confirming, in the framework of an experiment, that the created environment forms a closed system as a result of the experimental controls (Johnston and Smith, 2010). The observed incident patterns can be linked to the research involvement to the degree that closure can be shown since other justifications will be unlikely (Johnston and Smith, 2010). The ability to assume that the claimed causal relationship may be generalised to and throughout other measurements of cause and effect as well as between various kinds of people, locations, and periods is known as external validity. The Positivist paradigm demands that any model's hypotheses must be validated empirically before being integrated into the model (e.g., TAM, TPB, DTPB) (Johnston and Smith, 2010).

Interpretivist research believes that scientific knowledge should be achieved by understanding the human and social interaction by which the subjective meaning of reality is constructed (Goldkuhl, 2012). Epistemologically, interpretivists argue that to understand the meaning embedded in human and social interaction, researchers need to engage in the social setting investigated, and learn how the interaction occurs from the participants' perspectives. Field studies that engage researchers in real social settings would be more appropriate for generating

interpretive knowledge (Goldkuhl, 2012). Methodologically, intensive interviews and observations are required in order to fully understand such phenomena, and qualitative methods such as ethnographies and case studies are preferred.

When the statistical analysis is not performed, the interpretative perspective is criticised for lacking confidence; as a result, dependability and validity are also criticised. Lincoln and Guba (1985, p. 289) first introduced the trustworthiness notion to assess qualitative research—four factors—"credibility, transferability, dependability, and confirmability—makeup trustworthiness". The term "credibility" refers to the internal validity of data that addresses whether the findings are trustworthy. Transferability is the external validity that demonstrates how results may be used in a different environment. Dependability is the reliability that illustrates how broadly the study findings are relevant at various points in time. Lastly, confirmability is a concept related to objectivity that responds to the query of the degree the researcher allowed personal beliefs to influence the study (Bryman, 2016).

From a critical realism perspective, theory testing is not acknowledged as a component of case studies because theory testing relates to the hypothetic-deductive method of research exploration. Besides, there is a problem with theory testing in positivist studies. Because nothing else that experience can be validly analysed, limiting the objects of research indicates that science's goal is to collect and predict facts rather than to explain the process that produced those experiences deeply (Tsang, 2014). Therefore, construct validity, internal validity, and external validity must thus all be primarily focused on empirical concerns if a study focus is restricted to a comparison of experience with theory (e.g., Chin et al., 2020; Maican et al., 2019; Venkatesh, Brown and Bala, 2013).

Critical realism presumes an objective reality, but that reality is stratified, and made up of structures and mechanisms that generate the events we see in our daily lives (Bhaskar, 2008).

Critical realists collect data about occurrences to develop theory (hypotheses) and describe structure and mechanisms (e.g., an organisational and technical infrastructure supports, the influence of peers, technology characteristics, and the quality of content shared on ESN platforms) that give rise to observable events (e.g., gaining research grants, career progression, increasing the use of ESN platforms for exchanging knowledge) (Tsang, 2014). Critical realists are satisfied with adequate explanations of past events (theories such as TAM, IDT, TPB), while positivists focus primarily on exploring policy relationships with predictive power (Tsang, 2014).

Positivists and interpretivists prefer quantitative and qualitative research methods, respectively, while the researcher, as a critical realist, prefer to use a pluralist methodology in this research. Critical realism identifies detailed causal mechanisms (e.g., increasing sharing knowledge using tagging and resharing posts, lack of organisational and technical support for academic staff use of ESN platforms, not being influenced by peers for knowledge sharing on ESN platforms) (Bhaskar, 2011), which have been missing in previous studies by trying to connect ESN use to higher education.

A key indicator of a theory's success is if it can be used to solve resources in unobserved situations or solve similar (but unrelated) technology-related challenges. Empiricism fails because it does not truly provide the kind of reasoning needed to draw the generalisations about the use of assumptions to hypothetical objects, which is necessary for a researcher to assert external validity (Tsang, 2014; Johnston and Smith, 2010). Therefore, empiricism may not capture everything in the research problem. Consequently, other causes that influenced the use of ESN in an open system may not show in a closed system or empirical research. The main goal of assessing these three forms of validity for the critical realist is to determine how far the generative mechanism can be described as responsible for the actual events in the research

problem, with each form of validity operating in a new context within the three domains of the real (Tsang, 2014; Johnston and Smith, 2010).

3.2.2 Critical Realism

Critical realism implies an objective reality that exists independently of our thoughts, and one of the goals of knowledge acquisition is to discover it (Bhaskar, 2011). Criticism of the "epistemic fallacy" (issuing in empirical realism) (Bhaskar, 2008, pp. XVI), which combines reality with our understanding of it, is a crucial aspect of critical realism. Critical realism also claims that all explanations of reality are filtered by language, definition and social context and because it is impossible to step beyond our own perspectivism, the gap between reality and our understanding of it will never be bridged (Bhaskar, 2011). The reality pictured by Bhaskar (2011) and others (Sayer, 1992) is complex and multi-layered.

In the world, transitive and intransitive objects of knowledge are distinguished by Bhaskar (2011). Intransitive objects are the "real things and structures, mechanisms and processes, events and possibilities of the world; and for the most part they are quite independent of us" (Bhaskar, 2008, p. 12). The existence of Intransitive objects does not depend on human knowledge or perception. On the other hand, transitive objects consist of theories, paradigms, models and methods. The existence of transitive objects depends on human activities.

The main characteristics of critical realism are these differences between what occurs and what we experience, as well as between an occurrence and the underlying (but sometimes unobservable) mechanism that caused it (Johnston and Smith, 2010). Multiple causal mechanisms, including individual interpretations of each scenario, constantly interact with, deny, and reinforce each other in our complex social world (e.g., focus group in this study) (Zachariadis, Scott and Barrett, 2019). A generative mechanism is hardly certain or all-

explaining (Zachariadis, Scott and Barrett, 2019). Reality actually contains items and structures that have intrinsic causal capabilities and weaknesses, resulting in processes that may or may not be observable (Zachariadis, Scott and Barrett, 2019).

Sayer (1992) defined structures as groups of objects that are connected internally, whereas mechanisms are methods of action. Both structures and mechanisms are innately in the past, which enables or limits what can happen in a given context (Wynn and Williams, 2012). Objects are connected within a structure in that their meanings are dependent on their interactions with other structural components. In this study, the relationship between consumptive users and contributive users requires the existence of an ESN that provides a place for sharing work-related and up-to-date information. In addition to infrastructure and technical support, the presence of significant people who motivate others to use ESN, build new relationships and maintain existing ones, helps to form a structure. Consumptive users and contributive users are connected within a structure in the sense that their identities depend on their being in a relationship with other structural components. Models currently employed in IS concepts literally show structures made up of multiple constructs (Tsang, 2014). The research model proposed (Figure 2.1 in chapter 2) in this study therefore shows structures that consist of multiple constructs.

Bhaskar viewed reality in three domains: the real domain, the actual domain, and the empirical domain. Positivism and interpretivism concentrate on the empirical domain of reality, which is composed of events recorded explicitly or implicitly, however, they can be derived through a mixture of empirical research and theory development (2008). Behind events (empirical domain) are structures and generative mechanisms with persistent attributes (Johnston and Smith, 2010). In domains of reality, the combination of structures and mechanisms can result in events and can be observed, but events occur whether or not people observe or detect them.

Structures and events are real and separate from the patterns of events they generate (Bhaskar, 2008). The absence of an event does not necessarily imply the absence of the underlying mechanisms (Bhaskar, 2008). The actual domain refers to those events, whether they are identified or not. Critical realists focus on the real domain, which contains generative mechanisms able to produce patterns of events. A constant conjunction of events observed in the empirical domain, according to critical realists, is hardly a sufficient or necessary condition for a causal rule. According to realism, there is a real connection between causes and their effects in the pattern of some "natural necessity" that connects the two together (Mcevoy and Richards, 2006). Figure 3.1 presents the stratified ontology of critical realism adopted by Bhaskar (2011).

Cause and effect, according to critical realists, concerns the powers of objects, or what an object will or can do in the appropriate conditions due to its intrinsic nature, rather than a relationship between discrete events, which we identify as cause and effect. For instance, contributive users have the power to share information on ESN or to provide information in response to the enquiries of consumptive users. Whether or not consumptive and contributive users will carry out specific actions on ESN and thus exercise their power must be explained by recognising the circumstances surrounding the action. Causal powers are sometimes possessed not only by consumptive or contributive users, but also by the social interactions and structures they shape. For instance, because academic staff use Microsoft Yammer on voluntary base for knowledge sharing, their usage has not been influenced by peers, decision-makers, the Dean and the Head of Department.

The real impact of the stimulated mechanisms will depend on the circumstances under which causal powers are executed. There are two types of such circumstances: intrinsic or extrinsic. Intrinsic circumstances are the attributes of an object that allow constant mechanism activities

(Sayer, 1992). For instance, breaching the intrinsic circumstance means that consumptive users and contributive users could not manage to access and use ESN if it takes much time to read or post information. A further example is that consumptive users stop using ESN, or use less ESN, if the content shared on the platform is not work-related or is out of date. Extrinsic circumstances are those that exist outside objects but have an effect on how mechanisms work (Sayer, 1992). An extrinsic circumstance for consumptive users and contributive users may mean resisting the use ESN if they don't receive technology and infrastructure support from the university. Another example of an extrinsic circumstance is where consumptive users obtain rewards such as funding opportunities, or promotions, through using ESN.

Several authors (Sayer, 1992; Tsang, 2014) believe that critical realism should be the preferred philosophical perspective guiding case study research. According to Wynn and Williams (2012), the case study method is an excellent way to investigate the interaction of structures (e.g., social influence, facilitating conditions, information value etc.), events, human behaviour (communication and competition for research opportunities between consumptive users and contributive users), and contexts (higher education) in order to identify and interpret generative mechanisms. Case study research allowed the researcher to uncover more causal, organisational, and significant issues, such as resisting the use of ESN in an academic environment. As a result, testing the validity of theory generalisations was essential for this research. The term theoretical generalisations relate to generalising from case study results to theory (Sharp, 1998). Table 3.1 was taken from Tsang's (2014) discussion and comparison between positivist, interpretive and critical realist generalisation views from case studies.

Critical realism is comprised of hypothesised structures and mechanisms that perform in the real domain (Sharp, 1998). This study made theoretical generalisations by developing explanations for the relationships between the variables (e.g., information value, feature value,

relationship expectancy etc.) observed in the case study. Ideally, the theory applies to the population from which the case was derived, as well as other populations or other UK universities. The goal is for the generative mechanisms or academic staff behaviour toward using ESN for knowledge sharing, that resulted in visible events in this specific case to produce similar results in other UK universities. Critical realists analyse events to investigate ever deeper layers of reality and develop theories that define the structures and mechanisms that give rise to observable events. The analysing of events is a valid to explain what characteristics or factors (e.g., performance expectancy, effort expectancy, social influence etc.) must exist in order for the use of ESN to exist and exist in its current form.

3.2.3 Principles of Critical Realism for Assessing the Validity of Research

According to Bhaskar (2011), there are four principles of critical realism for discussing research validity. The difference between a theory and the generative mechanism to which it belongs is the crucial aspect of comprehending how the implications of critical realism for theory testing and validity differ from those of empiricism. For instance, many existing theories (e.g., TPB) have been utilized to explain technology adoption behaviour. Others have been developed for that reason (e.g., TAM and UTAUT). These theories have constructed assumptions, use in particular perspectives (e.g., end-user, programmer, or administrator), or are applicable under specific conditions (e.g., voluntary versus required). Therefore, they are meant to explain specific examples of occurrences rather than all possible occurrences. Critical realism distinguishes the actual consequences of that generative mechanism in specific circumstances from the generative mechanism itself.

According to critical realism, there is a difference between empirical evidence of the actual (what happened) and the actual instance (what we perceive happened). For instance, the voluntary adoption of ESN by a user differs from the empirical evidence that allow us to

understand that process (measures of ease of use, usefulness, intention, and so on). The theoretical implication is that critical realists try to remove possible explanations by testing the potential effect of these mechanisms or factors specifically in more than just the context in which the theory was developed.

Much less attention has been paid to using case studies for theory testing (Tsang,2014). Critical realists claim that knowledge is prone to error (Sayer, 1992). Because real structures and mechanisms are invertible, critical realists can never be certain that the mechanisms postulated by a theory exist. Johnston and Smith (2010, p. 32) explained theory testing from critical realism viewpoints, "showing that the generative mechanism that the theory describes produces the actual events that constitute the research domain to which the theory applies". According to George and Bennett (2005, p. 119), theory testing involves applying a theory in a variety of "institutional settings, cultural contexts, time periods, and geographical settings and situational contexts". Testing theories includes undertaking duplicate studies in various contexts. Case studies are best suited for theory testing since they use an in-depth investigation method to discover generative mechanisms, and the developed theory must be applied to additional empirical tests. The mechanisms discovered in the research case study can be compared to those proposed by the theory under consideration, and confirming results provide insight into the theory's generalisability to new contexts

Since the focus of the research becomes the generative mechanism underlying events rather than observation of events (empiricism), the concept of validity in the research are different from empiricist's view. For a critical realist, construct validity is concerned with whether empirical evidence provides insight into the actual events (e.g., providing technical and infrastructure support, getting research grants, building, and maintaining existing and new friendship) in the survey that are supposedly triggered by the generative mechanism. For

critical realist, internal validity, on the other hand, is focused on demonstrating that the generative mechanism is what caused the actual occurrences seen in the survey (e.g., low technical and infrastructure support, not being influenced by senior academic staff to use ESN). For critical realists, external validity is the likelihood that the generative mechanism that produced the actual occurrences in the survey also produces the events that occur more frequently in the issue domain.

Table 3. 1 Positivism, interpretivism, and critical realism are compared in terms of generalising from case findings

	Positivism	Interpretivism	Critical Realism
Empirical Generalisation	Empirical generalisation is minimized because it is associated with statistical generalisation and statistical generalisation of case findings is not possible.	Empirical generalisation is unlikely, because reality perceptions are dynamic and subject to change over time. Naturalistic generalisation is about inductive comparison.	A representative case can be used to determine the demi-regularities of the population to of the case belongs. This information provides the foundation for developing further theories.
Theoretical Generalisation	In response to the common criticism that case studies are difficult to generalise, theoretical generalisation is emphasized. In supporting theoretical generalisation, cases should be treated as experiments.		Case studies give valuable insight into how the proposed mechanism work under a variety of conditional situations.
Theory Testing	Positivists minimize the significance of the case research into theory testing, considering the conventional view of validating hypotheses built on statistical techniques	Theory testing is not acknowledged as a component of case studies because theory testing relates to the hypothetic-deductive method of research exploration.	The proposed mechanism by case studies can be measured by those proposed by the theory in question. Any contradictory results may help set defined boundary conditions for the theory.

Source: Tsang (2014)

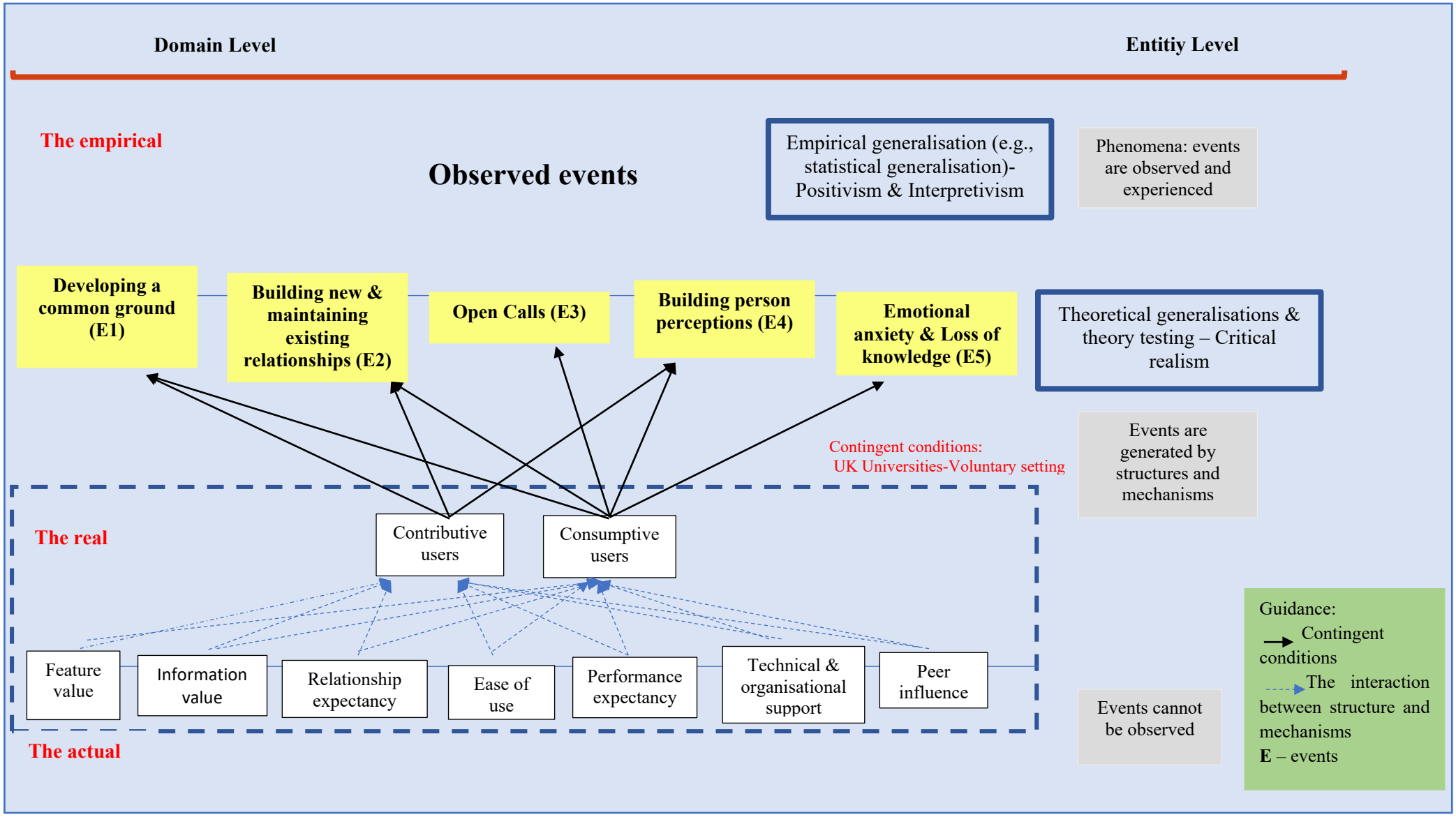

Figure 3. 1 The stratified ontology of critical realism adopted by Bhaskar (2011)

3.2.4 The Rationale for Adopting Critical Realism and Grounded Theory

Grounded theory is a research approach that includes structured but adaptable guidelines for gathering and interpreting qualitative data to create hypotheses from the data (Charmaz, 2014). According to Charmaz (2014, p. 1), grounded theory "begins with inductive data, invokes iterative strategies of going back and forth between data and analysis, uses comparative methods, and keeps you interacting and involved with your data and emerging analysis". Grounded theory seeks to inductively build a new theory through a process of continuous data gathering and analysis (Glaser and Strauss, 1999). The researcher analyses and codes input data (Glaser and Strauss, 1999, p. 45) and selects novel data sets for their potential to develop emerging advanced analytics through a process known as "theoretical sampling". Researchers write memos during the study to capture internal analytic conversation, improve self-awareness, and serve as extra data for coding and analysis. Coding allows researchers to clarify what is going on in the data and begin to deal with what it means (Charmaz, 2014). Theoretical sampling, theoretical saturation, constant comparative and iterative coding and analysis phases, memo writing, and theory development are characteristics of grounded theory (Guetterman et al., 2019).

This research employed grounded theory with mixed methods for following reasons:

a) Examining factors affecting the use of ESN between consumptive users and contributive users in higher education has received a little attention and there is no theory to guide practice. As mentioned earlier in Chapter Two, some studies (Maican et al. 2019; Al-Daihani, Al-Qallaf and AlSaheeb, 2018; Arshad and Akram, 2018; Dermentzi et al., 2016; Donelan, 2016; Manca and Ranieri, 2016; Veletsianos and Kimmons, 2013; Gruzd, Staves and Wilk, 2012) have investigated the effect of ESN on knowledge sharing between academic staff without specifying two types of users. These few studies have chosen either

a qualitative or mostly quantitative approach (e.g., interviews and surveys) to investigate factors affecting the use of ESN among academic staff. Such scholars (e.g., Maican et al. 2019; Arshad and Akram, 2018; Al-Daihani, Al-Qallaf and AlSaheeb, 2018) conducted surveys to assess the individual acceptance and use of ESN in higher education, and used IS models such as TAM, UTAUT with merging personality traits, DTPB and uses and gratifications theory. These scholars explained that these existence models are appropriate for understanding behavioural intentions in IT studies and examining the uses of new technologies by individuals. As a result, positivist researchers concentrate solely on observable events while ignoring the extent to which those observations are affected by previous predictive frameworks. Because of its substantial dependence on the scientific method and the fact that it built a foundation before the investigation, positivism has faced opposition. They argue that social realities, particularly those involving people, cannot be explained by the scientific method.

Other scholars (e.g., Gruzd, Staves and Wilk, 2012) employed UTAUT in semi-unstructured interviews to assess academic staff behaviour regarding social network use. These scholars suggested that adopting UTAUT in a qualitative study could explain why academic staff are more or less likely to adopt and use a particular information technology. The interpretive stance is criticised for its lack of certainty in virtue of the fact that statistical analysis is not used, therefore, is reliability and validity are criticised.

This research argued that quantitative studies may not be the most appropriate types of method, because positivists are not able to measure the relationship between the mechanism and the structure by evaluating the structure if it had been limited into a closed system.

The implication of critical realism is the ability of generating explanatory hypotheses subject to non-predictive but empirical test (Bhaskar, 2011). Therefore, grounded theory is an

appropriate method by allowing the researcher to explore the interactions between mechanisms and social structures in a real domain (e.g., how academic staff believe that organisational and technical infrastructure exists to support for knowledge sharing?). Therefore, it gives a valuable insight into the proposed mechanism work under a variety of conditional situations in an open system. Grounded theory could use the data to generate theory and ultimately produce hypotheses that account for the behaviour seen in testing. Testing a theory therefore enables a researcher to remove extraneous data or confirm variables to gain a clear picture of the most likely causes of the problem.

b) According to critical realists, all observation is imperfect and subject to inaccuracy, and all theories are subject to revision. Critical realists consider that the objective of science is to persistently commit to the goal of getting it right about reality even if they can never attain that goal, in contrast to positivists, who think that the goal of science is to unearth the truth. Critical realists emphasise the necessity of using triangulation across these various error-prone sources to better understand what is happening in reality because all measurements are subject to multiple types of error. This is necessary because different measurements and observations may each have different types of errors (Trochim, 2023).

Grounded theory allows for the triangulation of arguments that sound contradictory within conventional paradigms but have become coherent when seen through the perspective of a critical realism (Mcevoy and Richards, 2006). Triangulation provides a more comprehensive understanding by bringing together knowledge gathered from many viewpoints and promoting the examination of emerging discrepancies (Mcevoy and Richards, 2006). The theory developed in this study indicated how the generative mechanisms (e.g., the low level of technological and infrastructure supports, the influence of dean, head of department, and colleagues to use the technology, relevant contents about

funding opportunities, technology features and ease of use) that the theory explained produces the actual events (e.g., low level of ESN usage, build new and maintain existing relationships, getting funding or promotions) in a single HEI. Testing the theory in more HEIs allows for generalising results and removes possible explanations specific to the context in which the theory was developed. Using multiple methods remove bias that potentially affecting the findings. When various methods generate comparable results on a single topic, the findings are more robust.

The difference between constructivists and criticalists lies in how they view grounded theory (Charmaz, 2014). Grounded theory methodology can deal with the predefined different methods of data collection, involve larger social systems and specifically the ethical intent intrinsic to critical realism research (Oliver, 2012). Charmaz (2014) said that grounded theory is particularly suited to mixed-methods research. Moving between approaches and combining the results might be complemented by the iterative, inductive process of grounded theory. Therefore, iterative process in qualitative grounded theory in this research led the research to seek quantitative data. After establishing the analysis, the researcher put the emergent theoretical framework (i.e., the extended UTAUT) via quantitative testing.

Quantitative researchers may adopt grounded theory explorations to help them refine survey tools. To the extent that a mixed methods design can accommodate theoretical sampling, the project results will be stronger. Therefore, it is an advantage for mixed method research when grounded theorists may do a qualitative study on intriguing but undeveloped quantitative responses (Charmaz, 2014). In grounded theory, the researcher acts as an investigator and follows the evidence of the ideas, never knowing where they will go but always open to what could be discovered (Corbin and Strauss, 1990). The research question is usually imported from the data when the researcher identifies the fundamental issue,

seeking solutions from the participants. The idea of saturation is that the researcher can stop the analysis when they believe that there is nothing left to miss. The last element of the critical realist approach is that the practice has tended to employ mixed-method techniques (Kazi, 2003). Statistical analysis is often used to find patterns or generalisations in empirical phenomena, followed by qualitative investigation to seek a more in-depth explanation (Kazi, 2003).

This research employs mixed methods to collect data. The use of mixed methods has demonstrated its efficiency in the social sciences (Churchill, 1979), and boosted construct reliability and validity (e.g., Churchill, 1979). Mixed methods often incorporate qualitative and quantitative approaches, including their respective viewpoints, analyses and forms of inference to obtain breadth and depth of insight and to confirm the conclusions of each technique (Johnson, Onwuegbuzie and Turner, 2007). An emergent theory in this study implies the need for more than one form of data, as well as more than one sort of analysis (i.e., quantitative). According to Bryman (2007), the main purpose of qualitative-quantitative research is to illustrate the integration of the approaches and to produce a final product that demonstrates that the whole is greater than the sum of the parts.

The emerging theoretical framework in this study enables the researcher to improve the survey instrument and conduct quantitative testing. Mixed-method research benefits because grounded theorists can follow up with qualitative research on appealing but unexplored quantitative replies; a project's results will be more robust to the degree to which a mixed-method design can support theoretical sampling (Charmaz, 2014). The selection of methodology is therefore determined by the ability of various methods to transmit various factors regarding generative mechanisms, as well as the usefulness of such methods (Zachariadis, Scott and Barrett, 2019). Tashakkori and Creswell (2007) suggested that IS

research can benefit from this research approach, especially with a broadening base of interdisciplinary research and calls for more of the same (Venkatesh *et al.*, 2003). This thesis has used the following methods to collect the data: Web posts, focus group, questionnaire development, and a main survey as suggested by Churchill (1979). This research follows Churchill's (1979) procedures to develop a scale of measurement for the extended UTAUT constructs. A deep look at Churchill's (1979) proposed procedures reveals that the paradigm concentrates on qualitative and quantitative methods in developing better measures of constructs. Figure 3.2 presents the proposed steps in developing a better measurement modelling.

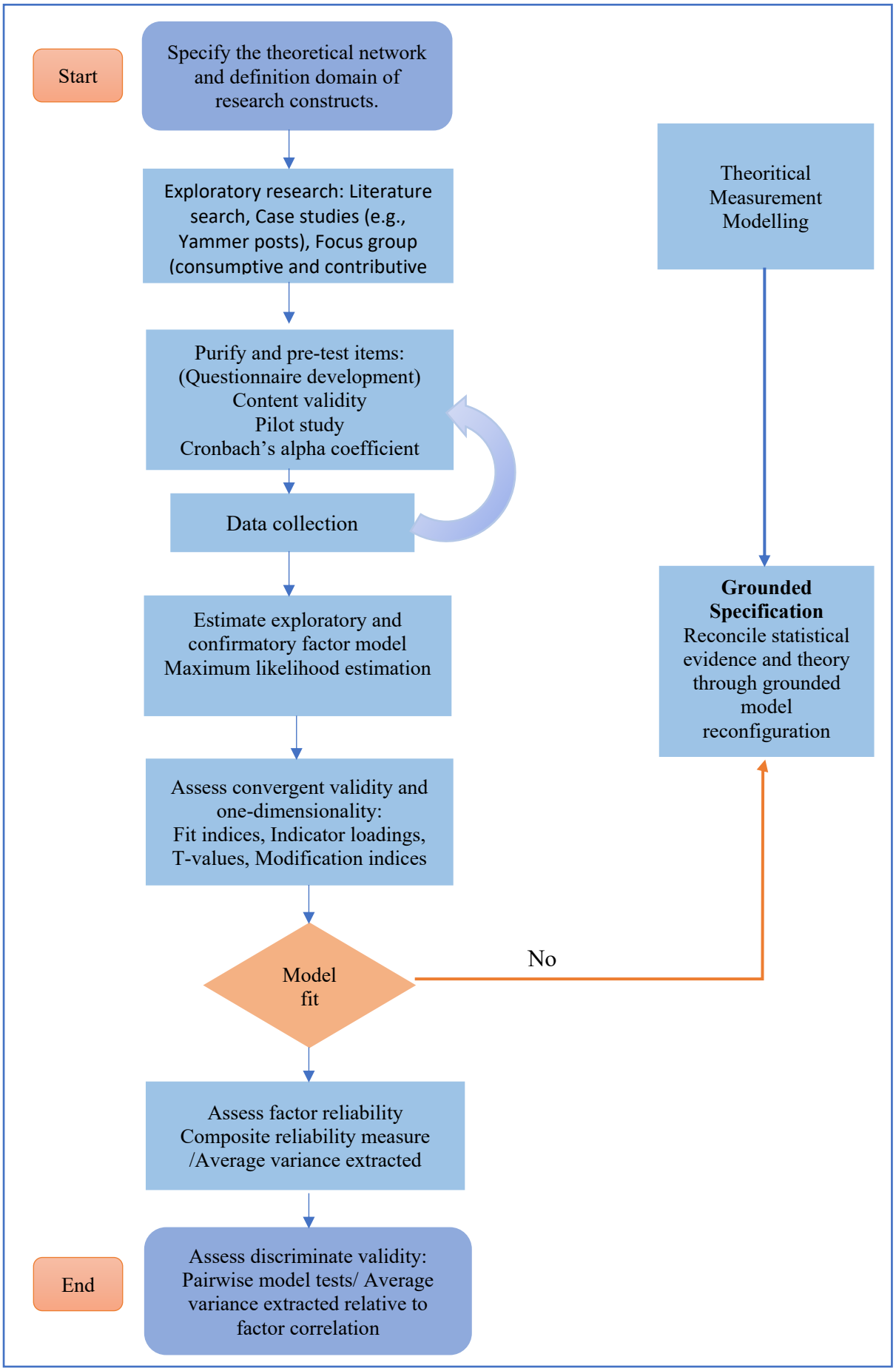

Figure 3. 2 Procedure for developing better measurement modelling.

Source: Churchill (1979)

3.3 Qualitative Data Collection

3.3.1 Case Study

Case study approach refers to "a group of methods that emphasize qualitative analyses" (Gable, 1994, p.113). According to Crowe et al., (2011), a case study is a type of research methodology that produces a comprehensive, multifaceted insight into a complicated problem in its real life. The data is collected from a few organisations through methods such as in-depth interviews, longitudinal studies, and participant observation. The case study approach is well suited to explain, define or investigate explore events or phenomena in their natural environments. This is why the case study method has been applied extensively in previous information systems research (Benbasat, Goldstein and Mead, 1987; Lee, 1989; Antill, 1985).

The approach captures information on "how", "what" and "why" enquiries (e.g., how Microsoft yammer has helped academic staff in universities?) (Crowe et al., 2011, p. 4). The approach also contributes to the advancement or improvement of theory by providing insights into where it falls short in its delivery (Crowe et al., 2011). This approach offers the opportunity to ask insightful questions (e.g., what are the motivators for, and barriers to, using ESNs among academic staff in higher education?), and to obtain the richness of organisational behaviour (e.g., communication and competition for research funding opportunities between academic staff) (Gable, 1994), however, the outcome may be limited to the specific organisations examined and may not be applicable to other similar organisations in general (Gable, 1994).

Defining the case, choosing the cases, gathering, and analysing the data, interpreting the data, and reporting the findings are the critical stages of case studies (Crowe et al., 2011). Each case must have a pre-established boundary that specifies the type of organization and the time period of data collection as well as the point in time at which the data was collected (e.g., collecting

data from 2017 to 2020). The relevant social group (e.g., academic staff), organisation (e.g., universities), and geographical area of interest to the researcher (e.g., UK), the type of evidence to be collected (e.g., yammer posts, participants' conversations) limit the case study (Yin, 2009).

In selecting the types of case studies to use in this research, a proper plan was required. This research looks to use a qualitative case study approach as most studies to date (e.g., Maican et al., 2019; Arshad and Akram, 2018) have taken a quantitative one which doesn't give the reasons behind why communication technologies are not used. This study chose to use an instrumental case study approach combined with collective cases (multiple case studies) as its strategy. This approach gathered qualitative data allowing for a deeper understanding of the factors influencing the use of ESNs for knowledge sharing in UK higher education.

For an instrumental case study, this research recruited and interviewed academic staff and administrative staff that used Microsoft Yammer for research and knowledge sharing in one university in the UK. The results of these interviews allowed the researcher to understand the motivators for and barriers to using ESNs in UK higher education. In addition, for collective case studies, this study captured Microsoft Yammer posts for over two years in two universities in the UK to better understand the norms, expectations, purpose, and intended audience for communication on the platform. The benefits of using an instrumental case study is that the results may be generalised, allowing for replication by others to see if results are repeatable in other settings (Stake, 1995).

Despite the benefits mentioned, the researcher is responsible for considering the study's ethical implications, including the possibility of accidentally violating anonymity or confidentiality and ensuring that attendees and involved sites have access to enough information to make an informed decision about participating in the study. The results of sharing this information may

be that attendees or organisations decide not to participate because they feel the emotional load or organisational inconvenience of supporting the fieldwork is severe (Collis and Hussey, 2014). Section 3.9 in this chapter explains about the ethical consideration for this study.

The case study strategy often entails the gathering of several sources of information utilising a variety of qualitative techniques (e.g., focus group and web posts) and quantitative technique (e.g., survey). Earlier in this chapter, the researcher mentioned about data and methods triangulation. Various data sources (data triangulation) can improve a study's internal validity (i.e., the degree to which the technique is suitable to respond to research questions).

3.3.1.1 Case Study One: Using Microsoft Yammer in University One

The UK-based university under examination has around 1,000 academic staff and nearly 15,000 students, including doctoral students, across several campuses. Microsoft Yammer was launched at the university in September 2014. In the first 12 months, there was little to no, activity on the platform. The university provided some online training sessions for employees and promoted the platform within the academic population. In recent years, Microsoft Yammer has become a place for sharing and supporting academics' research opportunities at the university. To date, 941 employees have joined Yammer at the university, although only one third of the Yammer users are active on the platform, and only some people have posted information over the last two years. While enterprise social networking is instinctively social, members are generally expected to feel confident in using ESN if the number of users in the network grows (Mahdi, Nassar and Almsafir, 2019). The low engagement on the platform could lead to it being controlled by specific individuals who provide content and frequently respond, which has emerged as a significant barrier to ESN use. This research collected a sample of web chats that took place on the platform in the university over two years, from June 2017 to June 2019.

3.3.1.2 Case Study Two: Using Microsoft Yammer in University Two

The second UK-based university under examination has around 8,000 administrative and academic staff and nearly 20,000 students, including doctoral students, across several campuses. It implemented Office 365, Microsoft Yammer in 2016 and it was one of the well-known applications used by academic staff, administrative staff, and students to communicate with many people across departments and campuses. Microsoft Yammer was adopted at the university to find out what people across the university were working on, to assist in meeting other staff with similar non-work interests, and to publicise an event or initiative that staff are working on. When data was collected for this study in 2017-2019 there were 13,578 users on the platform, the majority of which were active users.

In this case, staff used the platform for both work-related and non-work-related matters. Academic staff adopted two scenarios or series of actions. In the first scenario, staff discussed work-related topics and things happening on campus such as organising events, discussing vehicles and security issues, and sharing general departmental information. For instance, the ”Cyclists” community group had 196 members, and was a group in which users shared and discussed information about vehicle security and issues on campus. Another active group was ”Office 365 Tips and Tricks”, with 283 members; this group was dedicated to sharing tips and tricks about Office 365 apps and asking questions and receiving answers from experts on Yammer, Teams and webinar apps. There were also other work-related groups such as the ”Chemical and Molecular Science” group, with 208 members, who tended to share and discuss various general departmental matters and offer support for them. The second scenario in which users tended to use Yammer was for non-work-related matters or leisure. For instance, users with similar interests could arrange events to improve staff networking on and off campus, such as stitching classes, language classes, running or watching films, etc. This research

collected a sample of web chats that took place on the Yammer platform in the university over two years, from June 2017 to June 2019.

3.3.2 Focus Group

Focus groups have started to gain popularity in research into different social groups and cross-cultural and development research, as they are comprised of relatively homogeneous groups of people, and use in-depth group interviews giving the researcher the qualitative information required (Hughes and Dumont, 1993). According to Morgan (1998), in a less structured approach to focus groups, a moderator encourages participants to talk to each other instead of answering the moderator's questions. A moderator therefore attempts to facilitate discussion. Social science research aims to allow the in-depth exploration of selected issues and offers a powerful tool (qualitative research method) to help scholars understand human behaviour complexities (Clifton and Handy, 2003). Group participants therefore have a chance to discuss and interact on a specific topic. This is the main advantage of a focus group, which targets a different type of data not accessible through individual interviews. The researcher and group can therefore observe similarities and differences in their opinions and experiences through discussions (Hennink, 2014).

According to Hennink, focus group discussions are particularly suitable for investigating issues about which not enough is recognised or where the problem is uncertain. Focus group discussions can clarify particular behaviours or beliefs and their circumstances, assess a service and identify reasons for its success or failure, and gain various abilities and viewpoints on the study topic (2014). According to Chiang and Chan (2014), focus groups can be used before and/or parallel to quantitative research methods or in addition to a broader research approach where a range of methods are used (e.g., grounded theory), each with a different purpose. Qualitative and quantitative methods were applied in this research to gain a broader

understanding of the research issue (i.e., factors affecting the use of ESN between academic staff) that no single method could provide, so focus group discussions could explore more complex aspects of the research, and a survey could measure the research problem.

Gruzd, Staves and Wilk (2012) examined factors affecting the use of social media tools for collaboration and communication by conducting semi-structured interviews between fifty one academic staff and analysed the data through content analysis. They found that UTAUT constructs were a useful to assess factors influencing the use of social media between academic staff. However, there are limitations to their research. They do not distinguish between the intention to use social media and the actual use, nor do they mention a healthy balance in the use of social media by consumptive and contributive users.

In contrast, the focus group in this study identified the motivators for and barriers to using ESN by placing consumptive and contributive users together. The group also identified strategies to reduce the obstacles to communication and collaboration on ESN for research funding opportunities. The focus group helped to assess whether the adoption of ESN among academic staff was successful or unprofitable. Previous studies (Gruzd, Stave and Wilk, 2012; Maican et al., 2019) identified that while social media tools helped improve staff performance by building and maintain relationships, sharing knowledge, resulting in career advancement, there were still concerns around privacy. The ability to control the content posted and manage personal and professional contacts within a social media platform was a concern. In contrast this study shows the privacy concerns were more around the loss of competitive information rather than personal data.

The focus group also generates a large volume of data with multiple perspectives compared with the time spent on an in-depth interview. The results of focus group interviews can be presented simply, using lay terms and supplemented by quotes from respondents (Hennink,

2014). A focus group can generate data based on the synergy of the group interaction's (Rabiee, 2004). There is some debate about the comfort of individuals engaging in discussion with other members (Rabiee, 2004). Hennink (2014) believed that participants should share similar characteristics (such as gender, age, and ethnic/social background), but that they should not know each other in order to encourage a more honest and spontaneous expression of views during discussions. As a result, the focus group in University One included males and females in the same age group under fifty years old. Recruiting academic staff for a focus group was fairly easy as most subject areas work in silos - meaning they are unlikely to know each other well. Conversely administration staff tend to work in small teams for the whole university, so it is very difficult to find adminstrators who don't know each other well.

Conducting a focus group also involves some challenges. First, a focus group requires an experienced moderator to expedite the discussion and handle the group (Morgan and Scannell, 1998). The second challenge is controlling the group dynamics. For instance, there is always a risk that someone will dominate the discussion, inhibiting other members from contributing. Moreover, participants may follow others' opinions in the focus group discussion, with which they may disagree. This situation leads to social pressure to conform or the development of a hierarchy in the group (Morgan and Scannell, 1998). This results in a lack of diversity in the discussion and a reduction in the data quality. Figure 3.3 and Figure 3.4 present the strengths and the limitations of conducting focus group discussions. Nevertheless, the strengths of the focus group outweigh its limitations, because the interactions between consumptive and contributive users in the group discussions facilitates a common sense of community shared by respondents and the exchange of diverse viewpoints.

Earlier in Chapter Two, this thesis explained that Microsoft Yammer was the only ESN employed at different universities within the UK from 2014 to the middle of 2019. In 2019

only a handful of universities were using Microsoft Teams, but by early 2020 all universities had implemented Teams and other ESN tools such as Slack, Jive and Zoom and they were being used more extensively.

In order to recruit participants to the focus group adverts were posted in two places, as a news story on the University homepage and via weekly posts in the Microsoft Yammer platform. Although the adverts were posted for 3-months, only 16 people responded, of which only 12 were in scope for the study. It is believed that the low number of respondents was in part due to the low engagement and use of the Yammer platform. Although 12 was a low number Hennick (2014) advises focus groups should consist of five to ten participants per focus group depending on the purpose of the study. Therefore it was determined there were enough participants to continue with the focus group.

The focus group interview was conducted in February 2020 at University One for one hour with active contributive and consumptive users of Microsoft Yammer. Within the focus group, only two of the contributive users, and none of the consumptive users had experience of both the Microsoft Yammer and Teams platforms. Therefore even though Microsoft Teams had been implemented in the university, it wasn't yet a mature platform being used by academic staff.

Participants were given guidelines and instructions and asked to describe their experience with Yammer at the university, and how this platform could help raise collaboration among academic staff. Table 3.2 presents the details and the core points discussed in the focus group. Appendix E and F present the advert for the focus group, details of focus groups, and the points that were discussed, respectively.

3.3.2.1 Interviewing in Grounded Theory

Focus group interviews suites grounded theory techniques very well. Interviewing is unlimited but fast-paced, unstructured yet directed, just like grounded theory (Charmaz, 2014). Focus group facilitates open-ended, in-depth exploration of an area in which academic staff who adopted Microsoft Yammer have substantial experience. From the outset one of the aims of this research was to understand how academic staff were using Microsoft Yammer. In addition to identifying and exploring themes raised in the focus group, ideas were generated by analysing the data before going back to the field to ask additional questions.

Grounded theorists aim to focus on data collection to construct theory (Charmaz, 2014). Focus group interviews are crucial for gathering focused information to build conceptual abstractions. Grounded theorists have two main goals while interviewing candidates: attending to the research participants and developing theoretical interpretations. Four theoretical concerns: theoretical plausibility, direction, centrality, and adequacy, affect which data the researcher seeks and how researchers gather them in a grounded theory project (Charmaz, 2014).

It became clear early on in the focus group discussion that there were issues and barriers with using Microsoft Yammer, justifying the purpose of the research being carried out (theoretical plausibility). As the discussion progressed it was clear that the central aims of the research should concentrate on four main themes: motivators, barriers, outcomes, and strategies. These themes then became the central focus of the research and directed the rest (theoretical direction, centrality).

The initial data collections from the focus group greatly influenced the central direction of the research. Clarification of the research aims was only achieved after the initial data collection.

There are two issues with accuracy in data collection. From the perspective of grounded theory, gathering a large amount of data balances the detrimental impacts of multiple false stories and lessens the possibility of the researcher making in accurate statements or producing a superficial analysis. The aim of grounded theory is to reveal patterns visible and understandable (Charmaz, 2014). The accuracy and theoretical plausibility of the research were strengthened by collecting responses from academic staff, which covered the developed categories broadly and in-depth on motivators and barriers to using ESN in higher education. While the researcher conducted and analysed the data, the theoretical direction of the study began to emerge (e.g., why is there a low engagement between academic staff on Microsoft Yammer?). Much time was spent addressing the challenges of low participation on the platform by questioning user adoption resources, methods, and marketing strategies used to promote the platform between users Much time was spent addressing the challenges of low participation on the platform by questioning user adoption resources, methods, and marketing strategies used to promote the platform between users.

The question of how many participants a researcher should recruit pervades qualitative research and remains contested among grounded theorists. According to Charmaz (2014), the number of participants is determined by the level of analysis the researcher seeks as well as the objectives of a study. A small number of participants is sufficient when researchers attempt to answer straightforward research questions addressing issues in local practice in applied disciplines. She goes on to suggest increasing the number of participants when you investigate a controversial subject; expect or find unexpected or controversial study results; build an advanced conceptual analysis or seek out credibility of results.

There were twelve participants in the focus group discussion for this research. Six out of twelve participants were administration staff who contributed to the platform most of the time about

funding opportunities. The other six participants were academic staff who consumed information frequently and occasionally for funding opportunities, workshops, seminars, and brokerage days. The researcher believed that the number of participants was enough for this focus group because the number of active academic staff users of Microsoft Yammer was low. As this study mentioned earlier, only one-third of users were active on Microsoft Yammer at the university, and the majority of users had only joined the platform recently.

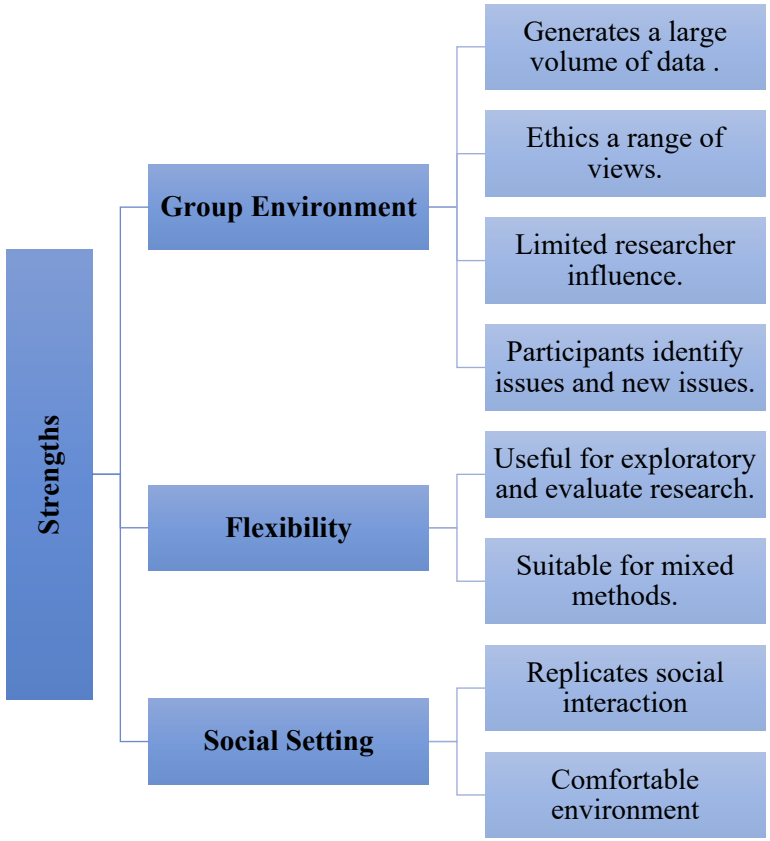

Figure 3. 3 The strength of focus group

Source: Hennink, 2014

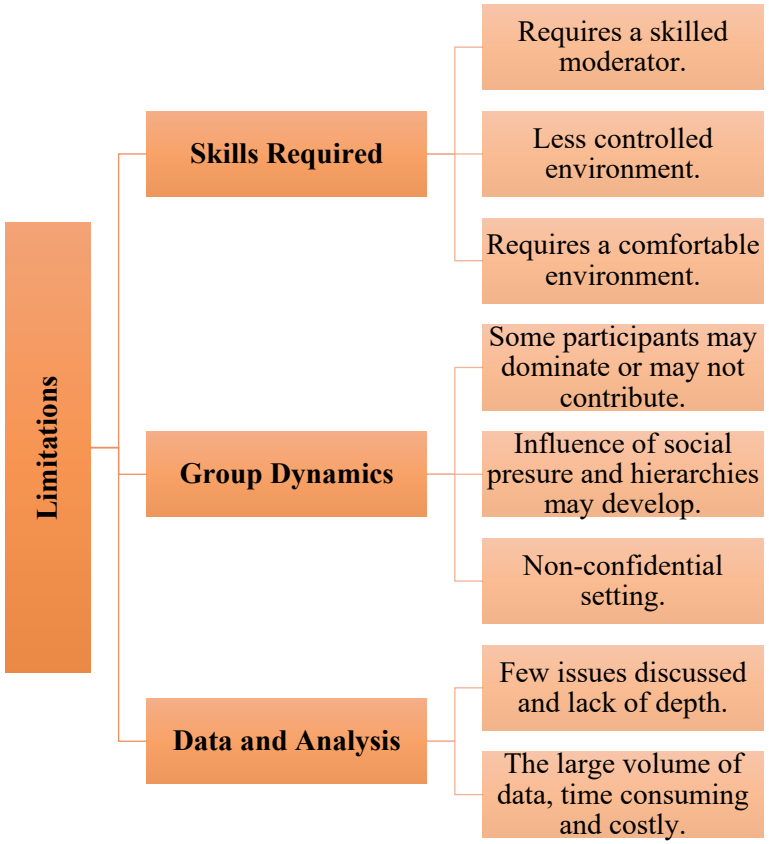

Figure 3. 4 The limitation of focus group

Source: Hennink, 2014

Table 3. 2 Details of the focus group and the main viewpoints discussed

Date	Group Size	Session Duration	Core Points Discussed
10/02/2022	12	1 hour	**Part 1*:* User's experience with Yammer** - How has Yammer helped you today? - Using Yammer, have you ever tried to find out what others have been doing or thinking, with a view to helping you develop a more accurate perception of others? - What are some of your favourite Yammer groups and why? - Has Yammer helped with promoting your core values, such as via the hashtag feature (e.g., #Horizon 2020, #call for papers, etc.), "Seen By" and "View Insight" groups? **Part 2: Issues with using Yammer** - What kind of user adoption resources and methods has the university used? How does the university get people to use the system? - What kind of internal marketing campaigns, training, support groups, etc. do you suggest for promoting Yammer at the university? - From what I have seen from Yammer posts, Yammer is used as a noticeboard. What makes you continue to post on Yammer even when there is no reply to these posts? Do you receive any responses outside Yammer? (e.g., via email?)

3.4 The Qualitative Data Analysis Procedure

3.4.1 Data Analysis Techniques

Qualitative data analysis techniques adopted in this study consists of two stages. The first stage used a genre analysis on a series of electronic posts generated on Microsoft Yammer for two years in University One and University Two. This method helped to identify specific genre conventions and determine their rhetorical effects. In the second stage, a grounded theory method was employed by collecting data through the focus group. This study used open coding, focused coding and axial coding to analyse major influencing factors of academic staff ESN use and build a model using the software NVivo 11.

3.4.2 Genre Analysis

This research applied genre analysis to a series of electronic posts generated on Microsoft Yammer over two years. This helped to identify specific genre conventions and determine their rhetorical effects. Swales' (2004) definition is helpful for this study, and the discovery of mutual communicative practices. Swales defined genres as communicative behaviours that members of society consistently exhibit to realise specific social purposes (2004). One can discern the essence of a community group's communicative structure in its context by discovering a genre repertoire (Grant, 2016; Grant and Preston, 2019).

The purpose of genre analysis is to define the suitable structure of every communication instance. Genre analysis has its roots in ancient Greek rhetoric studies; English for Specific Purposes (ESP) offers a more current scientific viewpoint on genre analysis, (Swales, 2004). Swales employed the term "genre clusters" as a catch-all for a variety of technical aspects (2004, pp. 20- 24). The term serves as a package containing a wide range of technical genre-related words. "Genre hierarchies", "genre sets", "genre chains", "genre networks" and "subgenres" are the most frequently used terms in the package (Swales, 2004, pp. 20- 24).

In genre hierarchy, the junior and professional associates in each science field use many different forms of genre. For instance, the most common types of genres in applied linguistics include lectures, conference papers, poster presentations, journal articles, book chapters, and so on. Genre chains refer to a different communicative event such as give a lecture at conference. Academic staff may use many different forms of genre, such as calls for papers, the submission of abstracts, submission of full papers, preparing PowerPoint presentations, presenting slides, questions and answers, and publishing a paper from a conference. Each step of a conference thus has its own genre, and these sequence of events or genres blend to achieve the communicative outcome (Swales, 2004).

Genre sets refer to the sum of the many genres in which a person or users of a certain society engage . For instance, academic staff may write books, publish papers, give lectures, present posters, chair conferences and supervise theses (Swales, 2004). All these activities constitute a genre, with its own genre chains , however, these genres are referred to together as genre sets (Swales, 2004).

The phrase "genre networks" refers to the technical name for the cause(s) from which every genre emerges (Swales, 2004). A book, for example, is not just a writer's creation. Rather, the writer sets up their work from a wide range of sources. Citations, quotes and other forms of material from various genres are combined to generate a new genre (Swales, 2004).

There may be various parts within the same genre and each part is referred to as a subgenre . A book, for example, is divided into three sections: the front content, the body, and the back content. The front content comprises pages such as indexing, title page and introduction. The body is made up of chapters, each of which has parts (Swales, 2004). The back content includes references and an index. All these divisions are referred to as a subgenres (Swales, 2004).

While genre analysis is often tied into ESP, it is indeed a component of conversation analysis and text analysis (Nodoushan, 2011). It is thus necessary to identify the multiple interacting genres that group members use. This study aimed to understand the routinised, notable forms of communication evolving through Microsoft Yammer. The study mainly focused on the conversational purpose in discovering genres. The plan was intended to illustrate how and why Microsoft Yammer participants used the platform, and which genres were most productive.

3.4.3 Grounded Theory Coding Stages

The first analytic stage in the grounded theory journey brings scholars to coding (Charmaz, 2014). Grounded theory coding consists of at least two phases: initial coding and focus coding. Charmaz (2014) defined coding as a segment of data with a label that simultaneously categorises, summarises and accounts for each piece of data. In other words, coding is the process of defining what data is about. In grounded theory, a researcher moves beyond existing statements in the data to making analytic sense of stories, statements, and observations. Analytic ideas may occur as a researcher collects data, observes interactions, witnesses research participant's non-verbal behaviour, and hears their ideas and their stories.

Conducting grounded theory coding involves at least two main phases:

1. Initial phase: this phase involves naming each word, line or segment of data.
2. Focused phase or selective phase: using the most significant or frequent initial codes to sort, synthesise, integrate and organise large amounts of data.

The visual representation of a grounded theory is illustrated in Figure 3.5.

3.4.4 Reliability in Qualitative Study

Everyone agrees that every research study has to be able to be analysed and evaluated. Therefore, analysing research is a core requirement before applying the results. Such evaluation has traditionally focused on evaluating validity and reliability (Long and Johnson, 2000). Long and Johnson defined reliability as the level of consistency or dependability of a measuring instrument. Srnka and Koeszegi (2007) believed that procedures are insufficiently systematic and rigorous to provide consistent results. Qualitative techniques include thought patterns that are challenging to quantify. How methodically the researcher analyses qualitative data affects the outcome significantly.

Reliability is the consistency with which examples are grouped into the same group by several observers or by the same observer at different times (Long and Johnson, 2000). According to Brink (1991), three tests, stability, consistency, and equivalence, could be used to assess reliability for a qualitative investigation. Stability is when a respondent provides the same information to the same questions when asked several times. Consistency is demonstrated when a respondents answers are worded differently but remain in concordance. Equivalence is demonstrated using different wordings for the same question during a single conversation or using two researchers observing independently (Long and Johnson, 2000).

Inter-coder agreement can be computed by a variety of methods (Holsti, 1969). Examples of such criteria that have been applied frequently and have been successful in assessing intercoder reliability are Guetzkow's U, Cohen's kappa and coefficient reliability (Holsti, 1969). Guetzkow's U is developed to ensure that two coders retain an identical quantity of text units by ensuring consistency (Srnka and Koeszegi, 2007). A high level of coder agreement should be below 0.1 (Holsti, 1996) However, a comparable number of codable text units is insufficient to guarantee coder reliability. Therefore, Cohen’s Kappa and coefficient reliability tests

account for chance agreements amongst coders when classifying text units into nodes. A widely used coefficient of reliability is the ratio of coding agreements to the total number of coding decision. However, this approach has been criticised since it ignores the possibility of accidental inter-coder agreement to a large extent (Holsti, 1969). Cohen's kappa was developed as an extension of Scott's *Pi* formula and adjusts not only for the number of categories in the category set, but also for the probable frequency with which is used (Holsti, 1969). Kappa has value 1 if there is perfect agreement between the raters, and value 0 if the observed agreement is equal to agreement expected by chance. Table 3.3 presents three formulas for unitising and inter-coder agreement.

Researchers often ask two raters to categorise the same set of participants separately in order to evaluate the reliability of a rating technique. The pairwise assessments of a collection of subjects into nominal categories are frequently produced in a contingency table. This contingency table is often referred to as an agreement table since its row names and column labels are the same. The quality of the rating instrument's categories and the capability of the coders to apply them may both be determined by the degree of agreement amongst the coders (Warrens, 2015). This research employed an intercoder consistency matrix which is presented in chapter 4 for genre categories and focus group developed themes.

Table 3. 3 Intercoder- reliability formulas.

Name	Formula	Meaning
Guetzkow's U	$\frac{(O_1 - O_2)}{(O_1 - O_2)}$	O is the observer or coder.
Coefficient reliability	$C.R. = \frac{2M}{N1 + N2}$	M is the number of coding decisions the two coders agree on, and N refers to the number of coding decisions made by coders 1 and 2, respectively.
Cohen's kappa	$\frac{\sum Pii - \sum Pi * Pi}{(1 - \sum Pi * Pi)}$	Σ Pii is the studied percentage of the arrangement, and Σ Pi x Pi signifies the possible agreement percentage.

Source: Holsti (1969) and Brenan and Prediger (1981)

3.4.5 A Guideline for Systematic Qualitative Material Analysis

A systematic procedure can produce a new theory and a foundation for quantitative analysis. Figure 3.6 presents a blueprint for systematic qualitative analysis. This procedure consists of five stages and each stage generate a certain output. In stage one and stage two, the qualitative material (i.e., Yammer posts, focus group) was collected and transcribed (e.g., N capture, usually from audio into text form).

The first step in doing a systematic analysis of qualitative data is to choose the unit of analysis appropriately (Stage 3) (Holsti, 1969). The data and research purpose will determine which unit will be used as the foundation for coding and subsequent analysis. Because the material from Microsoft Yammer posts and the focus group on this study were available in the form of longer text, they needed to be unitised for further treatment. Whether words, phrases, or text chunks are selected as communication units on which coding and analysis are based depends on the topic being studied (Charmaz, 2014). The technique of organising and reducing data by classifying qualitative information into theoretically meaningful groups is called categorisation (stage 4).

Usually, two coders need to define coding rules based on the category scheme. Srnka and Koeszegi (2007) suggested using the whole data rather than selecting a part of data to develop the category scheme to avoid selection bias. The specific meaning of the unit to be classified is reflected more accurately and reliably by category schemes with more detail, which increases their validity. The structure of classification can be hierarchical (i.e., main categories and sub-categories). Because they need to be repeated frequently, these two processes typically use the maximum resources and energy. Coding refers to systematically allocating codes (numbers) to units following the categorization structure (stage 5). According to Srnka and Koeszegi (2007), the definition of categories necessitates the independent assessment of at least two well-trained

coders to unitise and code the data independently (interpretative reliability). This study used Guetzkow's U, Cohen's kappa and coefficient reliability for intercoder tests of consistency in unitising and coding, and it followed the computation procedures from Brennan and Prediger (1981) and Holsti (1969).

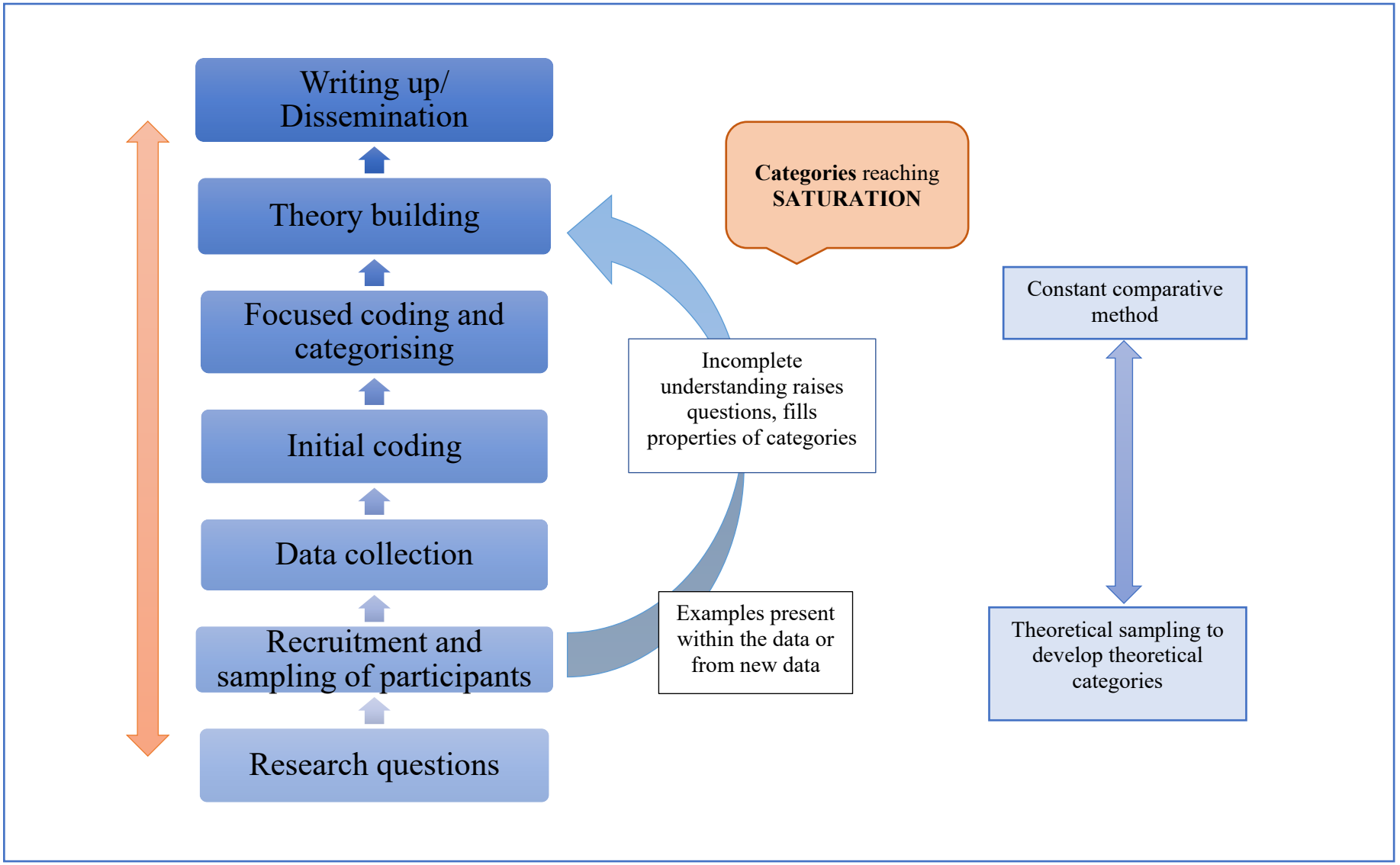

Figure 3. 5 A visual representation of a grounded theory

Source: Charmaz (2014, p. 18)

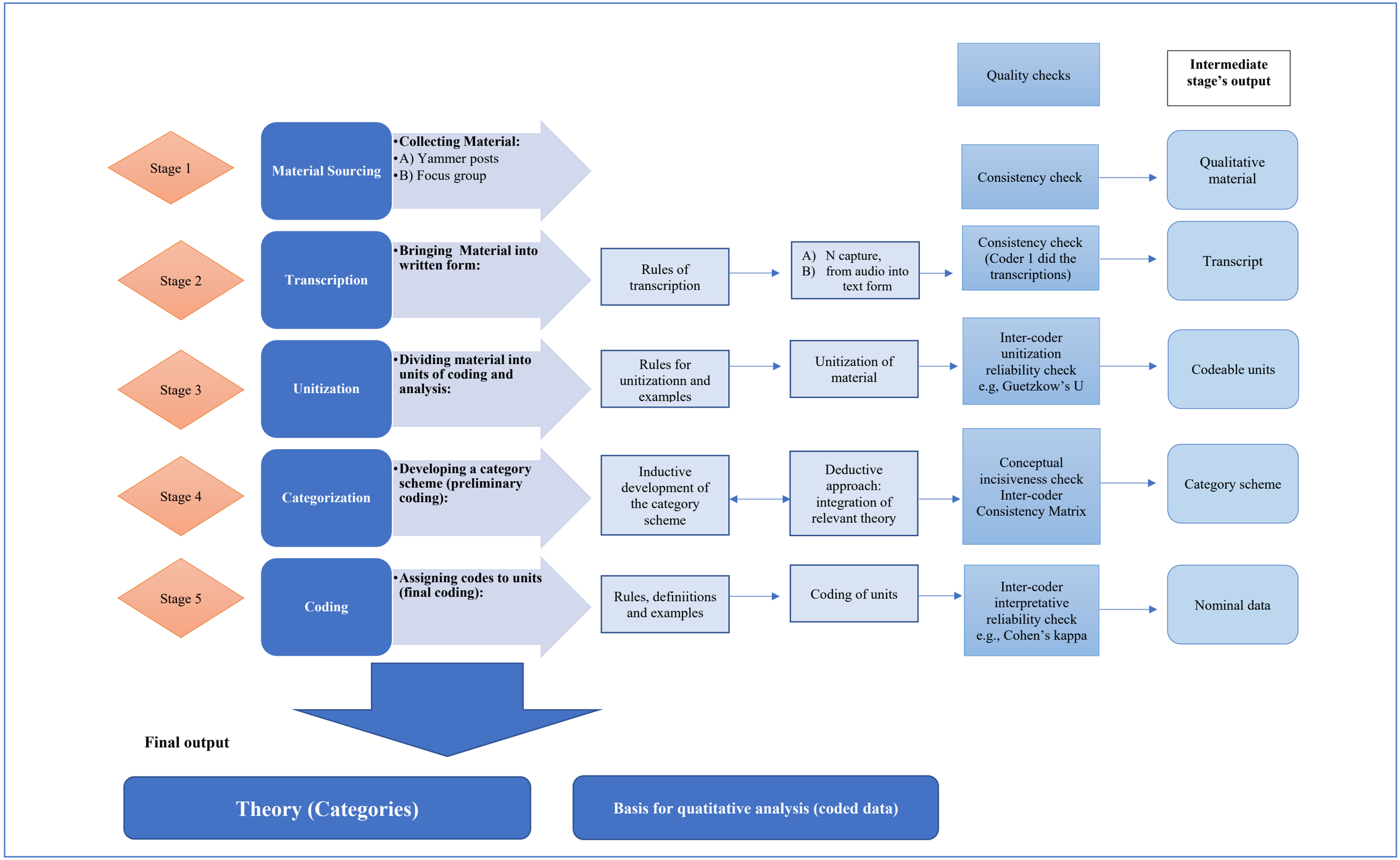

Figure 3. 6 A blueprint for systematic qualitative analysis

Source: Srnka and Koeszegi (2007)

3.5 Quantitative Data Collection

3.5.1 Survey

As previously stated, the goal of theory testing in this research is to demonstrate that the generative mechanisms (identified in the qualitative analysis) are either true or false by testing the potential effect of these mechanisms or factors (e.g., facilitating conditions, social influence) to real-world examples. The implication being that the theory could then be applied to other environments, not just universities in the UK.

This research applied internet-based survey method to collect data. Internet-based survey is affordable, offers instant access to a wide range of populations, and requires less time than traditional techniques to get data for analysis, and is easy to duplicate (Hays, Liu and Kapteyn, 2015). Online surveys benefit from the connectivity of the Internet in that they are easy to access from anywhere. Online surveys benefit from the connectivity of the Internet in that they are easy to access from anywhere and can reach thousands of people with similar demographics quickly. This allows researchers to access groups of people that would otherwise be unattainable via other communication channels - such as postal forms - which are easy to ignore or miss (Wright, 2005).

Another benefit of online surveys is the ability to measure latent constructs. Latent constructs are variables that researchers cannot directly observe or quantify (Burton, Mazerolle, 2011). Evans and Mathur (2005) stated that the main advantages of online surveys are as follows:

- The flexibility to employ them in various formats (e.g., language).
- Online surveys can be processed in a time-saving manner, reducing the data collection period.
- Participants can respond at a suitable time for themselves.
- All kinds of questions can be provided (e.g., dichotomous, multiple-choice, scales, open-ended questions).

- All data are stored in a database once the last questionnaire for a study has been submitted.
- The costs are lower in processing an online questionnaire.
- It is easy to track non-respondents, which increases the response rates.

However, there are problems associated with online surveys, such as:

- Selection bias associated with the Internet population (gender, age, education level, socio-economic level, etc.).
- Participation is on a voluntary basis and only attracted people participate in research.
- Unclear guidelines can prevent respondents from answering the survey since it is self-administered.
- Privacy-associated issues with how data will be utilised.

In addition, participants might not wish to respond to personal or confidential queries, and formal, and fixed-response questions may reduce validity, mainly if they are concerned with thoughts and feelings.

Collis and Hussey (2014) divided surveys into descriptive and analytical categories. Descriptive surveys refer to those used to measure consumer impressions of a new product and seek to represent occurrences at a particular time or overtime accurately. On the other hand, analytical surveys seek to determine if there is a link between two or more variables.

The researcher used SurveyMonkey, a cloud-based online survey tool, to collect data. This application is available worldwide and can be accessed by anyone via the internet. The researcher registered as a SurveyMonkey user and then designed the survey forms by using customised themes. The design of the survey affects the response rate, reliability, and validity of the collected data; hence, it requires great caution (Collis and Hussey, 2014). Bell, Bryman and Harley (2022) suggest some hints for designing user-friendly surveys to increase the response rate, reliability, and validity. These include adding a covering letter with clear

instructions for the participants, asking short questions, keeping the length of the survey short, as well as having a catchy layout. This advice was considered whilst preparing this research survey.

The following are the crucial processes in the research survey: survey design, pilot testing, revision of the sample and questionnaire, data collecting, and analysis (Blair, Czaja and Blair, 2013). Observations about the small group and generalisations about the overall population are made because of the sample, which is modest, reflecting the percentage of the population (Blair, Czaja and Blair, 2013). Nevertheless, research instruments need to be constructed to improve the quality of the data and better address the research questions.

The following sections discuss the three main stages of quantitative study: target population, sampling techniques and research instrument development.

3.6 Target Population and Sampling

3.6.1 Appropriate Number of Participants

Estimating the sample size is one of the most critical steps in the sampling design. To decide on the number required to make up an appropriate sample size is challenging. Sample size can affect numerous aspects of SEM, including parameter estimates, model fit and statistical power (Shah and Goldstein, 2006). This research decided to identify the most frequently employed practices in determining the appropriate sample size.

Roscoe, Lang and Sheth (1975) pursue a rule of thumb approach in determining the appropriate size and suggest:

- The use of statistical analyses with samples of less than ten is not advised.

- In multivariate research (e.g., multiple regression), the sample size should be at least ten times, or more, the number of variables being studied.
- The sample size should be larger than 30 and less than 500 in behavioural research. A sample of 500 or less ensures that sample error will not exceed 10% of standard deviation about 98% of the time.
- If researchers have more than one group, they employ more than 30 participants for each group. For instance, if comparing the responses of males and females in the sample, those two subsamples should keep to the rule of thumb.

Hair et al. (2010) stated that a suitable number for a sample size depends on the data analysis processes and Techniques. Hair et al. (2010) suggested five factors to determine the proper sample size when using the SEM technique.

I. Fifteen respondents for each parameter is an appropriate number, if the data distribution differs from the multivariate normality assumption.

II. Based on the estimation technique, the sample size should range from 150 to 400 respondents. Since SEM is based on the maximum likelihood estimation (MLE) technique, 124 respondents give an adequate result if the sample size varies from 150 to 400. In addition, if the sample size surpasses 400, then the MLE method becomes more sensitive, and goodness-of-fit results become poorer. MLE is an estimation method usually used in SEM. MLE is "a procedure that iteratively improves parameter estimates to minimise a specified fit function" (Hair et al., 2010, p. 710).

III. Model complexity: the more constructs a model has, the more parameters should be used in the analysis and consequently the bigger the sample size required to conduct analysis.

IV. In using a multi-group analysis, an adequate sample for each group is required. Moreover, in the case of missing data, a larger sample size is required.

V. Before determining the adequate sample size, the researcher should calculate communalities. Communalities refer to average error of variance of indicators and represent the average amount of variation among the measured/indicator variables explained by the measurement model. Communalities should be above 0.50, and if not, a larger sample size is required.

Therefore, based on the above discussion and since this research is based on SEM, this study decided to use a sample size of 250 participants or above.

3.6.2 Sampling Techniques

This research employs non-probabilistic sampling methods, such as purposive and snowballing sampling methods. The advantages of the virtual snowball sampling technique are that it can enlarge the geographical scope, and it enables the identification of individuals with barriers to access (Baltar and Brunet, 2012). Therefore, the use of virtual networks in non-probabilistic samples can raise the sample size and its representativeness (Baltar and Brunet, 2012).

The most eligible participants for this study were academic/administration staff in an institution where an ESN had been implemented. To recruit participants for the survey the researcher posted adverts in active groups on the current ESN platforms used in the university (i.e. Yammer, Teams). In addition adverts were also posted for over three months (from end of February 2020 to May 2020) on LinkedIn and via channels in other universities (Slack, Jive and Chatter) in order to get a broad view of responses. After a period of three months, a total of 272 responses were collected.

3.6.3 Justification for Using Five-Point Likert Scale

This study chose to use a five-point Likert scale with a midpoint of neutral to collect the data. A five-point Likert scale is generally utilised and comparatively easy for collecting the data

from respondents when using a survey (Preston and Colman, 2000). Likert-type scales represent an efficient technique for taking a wide range of variance in self-reported attitudes and behaviours (Hartley and Maclean, 2006). In recent years, some studies have been conducted on different aspects of the Likert-type scale. Matell and Jacoby (1971) studied the question of the ideal number of choices in two studies. They found that both validity and reliability are independent of the number of scale points. For instance, some scholars prefer using scales with seven, nine and sometimes 11 points over scales of two, three or four points. Using scales with seven, eight or nine points increases the reliability and validity of the research area, while using scales with two, three or four points generates lower internal consistency, validity and discriminating power (Preston and Colman, 2000). Moreover, the reliability and validity marginally change when using a seven-point Likert scale in comparison to use a five-point Likert scale. Many scholars recommend using a five-point Likert scale over other types of Likert scale in attitudinal research (Preston and Colman, 2000). Hartley and Maclean (2006) discovered that using a scale of five points often increases response rates up to 90% compared to a seven- to nine-point Likert scale. In addition, the mean produced by using a five-point Likert scale is the same as with 11-point Likert scales and a seven-point Likert scale. The correlation coefficient generated by a five-point Likert scale gives similar results to an 11-point Likert scale.

3.7 Research Instrument, Definitions and Scales

This section explains the scale items used to measure the constructs of this study: performance expectancy, effort expectancy, social influence, facilitating conditions, information value, relationship expectancy, contributive use, consumptive use, and professional benefits. The professional benefits construct scale has been developed based on the outcome of web posts and the focus group to measure the benefits gained by academic staff. The other scales were

developed from a review of the relevant literature. This study used five-point measures (1 to 5) commonly ranging from “strongly disagree” to “strongly agree”.

3.7.1 Measuring Performance Expectancy

This study uses a scale based on Venkatesh et al. (2003) and on Davis (1989) scale to measure the performance expectancy construct. According to Venkatesh et al. (2003), the five different constructs from the different models that relate to performance expectancy are perceived usefulness (TAM and C-TAM-TPB), extrinsic motivation (MM), job fit (MPCU), relative advantage (IDT) and outcome expectations (SCT). Davis (1989) suggests that two determinants, perceived usefulness and PEOU, have a particularly strong influence on system use. Performance expectancy in this thesis refers to the degree to which academics believe that using an ESN would help them access research opportunities and research accomplishments such as funding and productivity in their research. Table 3.4 presents the items before and after rewording and the source of performance expectancy.

Table 3. 4 Measuring performance expectancy

Statements before rewording	After rewording	Source (s)
Using the system in my job would enable me to accomplish tasks more quickly.	Using the platform allows me to accomplish tasks more quickly.	(Davis, 1989; Venkatesh et al., 2003)
Using the system would improve my job performance.	Using the platform improves my job performance.	(Davis, 1989; Venkatesh et al., 2003)
Using the system would increase my productivity.	Using the platform increases productivity.	(Davis, 1989; Venkatesh et al., 2003)

3.7.2 Measuring Effort Expectancy

This study uses a scale based on Davis (1989). Venkatesh et al. (2003) suggested three constructs to describe the concept of effort expectancy: PEOU (TAM-TAM2), complexity (MPCU) and EOU (IDT). Davis (1989) stated that PEOU is particularly influential on system use. The effort expectancy in this thesis refers to the ease with which academics use ESNs in their work practices. Table 3.5 presents the items before and after rewording and the sources of effort expectancy.

Table 3. 5 Measuring effort expectancy

Statements before rewording	After rewording	Source(s)
I would find the system easy to use.	The platform is easy to use	(Davis, 1989; Venkatesh et al., 2003)
The system is easily accessible (e.g., on a mobile device, iPad, laptop, etc.).	The platform is easily accessible (e.g., on a mobile device, iPad, laptop, etc.).	(Wang et al., 2014)
Learning to operate the system is easy for me.	I understand how to use the platform.	(Davis, 1989; Venkatesh et al., 2003)

3.7.3 Measuring Social Influence

To measure the social influence, this study uses a scale based on Venkatesh et al. (2003). Venkatesh et al. (2003) stated that social influence is a direct determinant of behavioural intention and social influence is represented as a subjective norm in TRA, TAM2, TPB/DTPB and C-TAM-TPB, as social factors in MPCU and as an image in IDT. In this thesis, it is mentioned that academic staff perceive that significant person influence their use of technology, including decision-makers, the Dean, the Head of Department and colleagues. Table 3.6 presents the items before and after rewording and the sources of social influence.

Table 3. 6 Measuring social influence

Statements before rewording	After rewording	Source(s)
The senior management of this business has been helpful in the use of the system.	The senior management group in my department actively participate and use the platform.	(Moore and Benbasat, 1991; Venkatesh et al., 2003)
Many people I work with in my department or college participate and use the platform.	Many people I work with in my department or college participate and use the platform.	(Moore and Benbasat, 1991; Venkatesh et al., 2003)
I use the system because of the proportion of co-workers who use the system.	A significant percentage of people in the university contribute and use the platform.	(Moore and Benbasat, 1991; Venkatesh et al., 2003)

3.7.4 Measuring Facilitating Conditions

This study uses a scale based on Venkatesh et al. (2003). This indicator portrays concepts expressed by three distinct constructs: perceived behavioural control (TPB- DTPB, C-TAM-TPB), facilitating conditions (MPCU) and compatibility (IDT). Each of these constructs is operationalised to involve aspects of the technological and/or organisational environment that are intended to remove barriers to use. In this study, the perception by staff of the resources and support available to achieve a behaviour comprises both technical and structural elements prearranged to abolish barriers to using ESNs inside higher education. Table 3.7 presents items before and after rewording and the sources of facilitating conditions.

Table 3. 7 Measuring facilitating conditions

Statements before rewording	After rewording	Sources
My organisation has a clear ESN purpose (e.g., how the platform benefits the organisation and employees).	The department I am working in has a clear purpose for using enterprise social networking at the university.	(Venkatesh et al., 2003)
Guidance was available to me in the selection of the system.	My university has established a platform usage policy and procedures for appropriate participation.	(Venkatesh et al., 2003)
A specific person (or group) is available for assistance with system difficulties.	My university provides training and education on the use of the platform.	(Venkatesh et al., 2003)
A wide range of organisations' activities and events initiated on ESN.	A wide range of research activities and events are established on the platform at the university (e.g., grant workshop).	(Venkatesh et al., 2003)

3.7.5 Measuring Information Value

This research defines information value as the degree to which the resources available in a network provide benefits for academic staff. This construct is close to information quality, defined by DeLone and Mclean (2002) and perceived output quality, defined by Bock et al. (2005). Moreover, this construct refers to the style of the content (i.e., informal conversation). This study uses a scale based on DeLone and Mclean (2002) and Bock, Sabherwal and Qian (2008) and the third item is self-constructed as found earlier in the focus group. Table 3.8 presents the items before and after rewording and the sources of information value.

Table 3. 8 Measuring information value

Statements before wording	After rewording	Source(s)
The content shared in an ESN is current and up to date.	The content shared on the platform is current and up to date.	(DeLone and McLean, 2002)
The content shared in an ESN is important and useful to my work.	The content shared on the platform is valuable and beneficial to my work.	(Bock, Sabherwal and Qian, 2008)
----------	The environment of the platform is engaging (e.g., having informal communication encourages users to participate).	(self-constructed based on the focus group findings)

3.7.6 Measuring Feature Value

Cleveland (2016) found that seven features, namely pervasiveness, brevity, knowledge source profile, subscription, reposting, directed communication and tagging, influence the use of enterprise social networking. He describes how microblogging can facilitate knowledge sharing among employees inside a common shared subject area. He goes on to state that future research should determine how new SNSs features may impact corporate knowledge creation systems. This construct is self-constructed. Table 3.9 presents the sources of feature value.

Table 3. 9 Measuring feature value

Statements before rewording	After rewording	Source(s)
----------	The content shared on the platform by high-profile users (including a picture of the user, a short biography and a stream of the user's post in a time sequence) is reliable and trustworthy.	Self-constructed
----------	Using the platform enables me to obtain needed information by easily subscribing to expert users.	Self-constructed
----------	I receive more followers when I actively get involved with questions and sharing required information on the platform.	Self-constructed
----------	I reshare posts published by other users when I find them valuable and useful.	Self-constructed

3.7.7 Measuring Relationship Expectancy

This construct uses Bock et al. (2005) scale. Bock et al. (2005) aimed to develop an integrative understanding of the factors facilitating or inhibiting individuals' knowledge-sharing intentions by employing TRA. Anticipated reciprocal relationships capture staff's desires to maintain relationships with others (Bock et al., 2005). Previous literature shows (e.g., Maican et al., 2019) that an ESN enables users to expand their relationships with other members and maintain their relationships with coexisting users. In this thesis, relationship expectancy is defined as the degree to which academic staff assume that using an ESN is beneficial in growing new relationships and maintaining existing relationships with other academic staff inside the university. Table 3.10 presents the items before and after rewording and the sources of relationship expectancy.

Table 3. 10 Measuring relationship expectancy

Statements before rewording	After rewording	Source(s)
My knowledge sharing would strengthen the ties between existing members in the organisation and myself.	Using the platform strengthens the relations between my colleagues and me.	(Bock et al., 2005)
My knowledge would expand the scope of my association with other members in the organisation.	Using the platform increases the range of my connections with other colleagues in the university (e.g., colleagues that I might not meet in person from another department).	(Bock et al., 2005)
My knowledge sharing would create strong relationships with members who have common interests in the organisation.	Using the platform creates strong relationships with individuals who have a shared interest in the university.	(Bock et al., 2005)

3.7.8 Measuring Consumptive Use

This construct uses Kügler and Smolnik's (2014) scale to measure consumptive use. Kügler and Smolnik (2014) aimed to understand factors influencing employee use of ESN platforms. In this thesis, consumptive use refers to the extent to which academic staff use an ESN for acquiring knowledge from the platform. Kankanhalli, Tan and Wei (2005) suggested that the success of KMSs requires that knowledge contributors be willing to part with their knowledge and knowledge seekers be willing to reuse the codified knowledge. Leonardi and Meyer (2015) believed that individuals are more aware, less uncertain, and subsequently satisfied with the transfer of knowledge when knowledge seekers use an ESN between locating the source of knowledge and asking about it. Knowledge flows freely when the relationship between consumptive and contributive users is strong, the knowledge is well understood, and consumptive users know how to get it (Leonardi and Meyer, 2015). Table 3.11 presents the items before and after rewording and the sources of consumptive use.

Table 3. 11 Measuring consumptive use

Statements before rewording	After rewording	Source(s)
I use the system to obtain information provided by my colleagues.	I use the platform to get information provided by other users (e.g., open calls, partner searches, events, news).	(Kügler and Smolnik, 2014)
I use the system as a way of acquiring knowledge.	I use the platform as a way of acquiring knowledge (by asking for help regarding task-related problems, accessing reports, etc.).	(Kügler and Smolnik, 2014)
I use the system to retrieve information made available on the platform.	I use the platform to retrieve information made available on the platform (e.g., using topical categorisation, #hashtag).	(Kügler and Smolnik, 2014)

3.7.9 Measuring Contributive Use

This construct uses Kügler and Smolnik's (2014) scale to measure contributive use. The study by Kügler and Smolnik (2014) aimed to understand factors affecting employee use of social media. This thesis considers the extent to which academic staff use an ESN for contributing knowledge to the platform (e.g., by posting a blog entry or uploading a document). In this research, the contribution of useful knowledge (e.g., research funding opportunities) improves the dissemination of valuable knowledge between academic staff and helps to promote them within their career path (e.g., fellowship positions). Table 3.12 presents the items before and after rewording and the sources of contributive use.

Table 3. 12 Measuring contributive use

Statements before rewording	After rewording	Source(s)
I use the system to contribute my knowledge to the platform.	I use the platform to provide information to my colleagues (e.g., open calls, partner searches, events, grant workshops, general news).	(Kügler and Smolnik, 2014)
I use the system to submit knowledge to it.	I use the platform to contribute my knowledge to the platform (e.g., posting information about the events that happened before, my experience, etc.).	(Kügler and Smolnik, 2014)
I use the system to provide my colleagues with information.	I use the platform to respond and help my colleagues' enquiry posts.	(Kügler and Smolnik, 2014)

3.7.10 Measuring Professional Benefits

Professional benefits refer to the variety of opportunities for collaboration, such as improving knowledge sharing and experiencing a feeling of connectedness among staff in academic and commercial settings, however, in this research, these opportunities refer to open calls, academic workshops, and upcoming academic news based on web chats (genre analysis) and the focus group findings. Ramayah, Yeap and Ignatius (2013) measured knowledge sharing among academic staff into four classes: publishing in open literature, participating in internal communications such as meetings or workshops, participating in informal communications, and collaborating with groups of researchers. The advantages of knowledge sharing among academic staff thus include improving performance in decision making and obtaining rewards such as funding opportunities, career promotion, improved relationships with other academics by joining conferences, workshops and brokerage events. The scale is self-constructed, based on the qualitative study in this research and Bock et al. (2005). Table 3.13 presents the items before and after rewording and the sources of professional benefits.

Table 3. 13 Measuring professional benefits

Statements before rewording	After rewording	Source(s)
I will receive monetary rewards in return for my knowledge sharing.	I have applied for a research funding opportunity from the information shared on the platform, and I have received the grant.	Self-Constructed & Bock et al. (2005)
	I have joined the events or workshops posted on the platform.	Self-Constructed
I will receive additional points for promotion in return for my knowledge sharing.	I have applied for an academic research position from the information posted on the platform (e.g., research fellowships).	Self-Constructed & Bock et al. (2005)

3.7.11 Items Generations Results

A professional benefits construct, a feature value construct and their scales have been developed by this research. The remaining scales have been modified based on well-known scales that have high reliability and validity. Moreover, each construct is multi-item, as Churchill (1979) recommends. The questionnaire contains five-point Likert-type scales, ranging from "strongly disagree" to "strongly agree". For performance expectancy and effort expectancy, this thesis used a modified version of Davis's (1989) scale with three items for each construct. To measure social influence and facilitating conditions, this thesis developed a three-item scale and four-item scale based on Venkatesh et al. (2003), respectively. For measuring information value, this research developed a three-item scale based on DeLone and Mclean (2002) and Bock, Sabherwal and Qian (2008) as well as a self-constructed one (item 3). For relationship expectancy, this thesis employed a modified version of Beck et al. (2005) scale with three items. For measuring consumptive use and contributive use, this research employs Kügler and Smolnik's (2014) scale with three items for each construct. This research could not find an existing scale to measure feature value and professional benefits, so it developed a new three-item scale and four-item scale, respectively, based on existing literature

(Cleveland, 2016), case studies and a focus group. In total, the draft of the questionnaire comprised of 32 items. Table 3.14 presents the number of items proposed for each construct. Appendix G and H present the invitation for the online survey and the study questionnaire, respectively.

Table 3. 14 The constructs and the number of initial items

Construct	Number of initial items
Performance Expectancy	3 items
Effort Expectancy	3 items
Social Influence	3 items
Facilitating Conditions	4 items
Information Value	3 items
Feature Value	4 items
Relationship Expectancy	3 items
Consumptive Use	3 items
Contributive Use	3 items
Professional Benefits	3 items

3.7.12 Pilot Testing

To resolve any concerns before data collection and define the time needed for survey completion, the author validated the questionnaire using two phases, specialist assessment and pilot testing. Therefore, prior to starting the primary data collection, it is crucial to test the questionnaire. The pilot test might be carried out by selecting a small number of volunteers who meet the requirements for the research sample. In pilot testing the readability of the questions is checked, unclear instructions are noted, and participants are asked if any questions make them uncomfortable (Blair, Czaja and Blair, 2014).

Validity is getting an expert's or specialist's assessment of how representative and appropriate the questionnaire is. Firstly, a panel of experts in the same field must critically evaluate the

questionnaire's content. Secondly, the panel creates a valid scale of four essential characteristics: content validity, structural validity, relationships with other variables, and response process (Rubio et al., 2003). Content validities refer to "the degree to which the content of [a measure] is an adequate reflection of the construct to be measured" (Mokkink et al., 2010, p. 743). In other words, the scale items should be illustrative samples of the facets of the latent variable (Sigerson and Cheng, 2018). All constructs or factors in this study involved multiple variables, and to validate the content, the researcher relied on pre-tested and pilot-tested scales.

Thus, the researcher sent the questionnaire draft to three experts in the same field to rectify any concerns. Then, after refining the survey based on the expert's feedback, a pilot test was conducted with 14 participants to check the clarity of the questionnaire. All participants completed the survey and provided feedback about questionnaire's clarity, readability, layout, and flow. First, unclear questions were addressed, while others were moved to maintain a clear flow. In conclusion, critical feedback helped to develop the revised questionnaire.

The validity and internal consistency of the items that were employed for the same concept were then examined. Using Cronbach's alpha test, internal consistency seeks to evaluate the consistency of questions. A value of 0.90 indicates very high dependability, 0.70-0.90 indicates high reliability, 0.50-0.70 indicates moderate reliability, and below 0.50 indicates low reliability (Hinton, McMurray and Brownlow, 2014) Appendix H presents a revised version of the questionnaire.

3.8 Quantitative Data Analysis

Data input and data screening are the first steps in the analysis of quantitative data. The research instrument for data entry and data screening was IBM's SPSS 23 software. To obtain clean data, missing values, normality, multicollinearity, and outliers were checked. The demographic information was then evaluated. The next step was to purify the items using EFA. The reliability test was subsequently performed to understand the internal consistency of the measurements further. Lastly, AMOS version 23 was used to do SEM. It was used in two phases: CFA and testing the structural model.

3.8.1 Exploratory Factor Analysis

Factor analysis is used as a data synthesis or data reduction technique to reduce a vast number of variables to a more acceptable, crucial, and concise set of variables (Hair et al., 2010). Clarifying the unit of analysis, data synthesis or data reduction, variable selection, and applying the outcome of factor analysis for other multivariate approaches are the four primary uses of factor analysis (Hair et al., 2010). The unit of analysis for factor analysis is either respondents or variables. Analysing the correlation between respondents or the correlation between variables may help to clarify the pattern of links between variables or respondents (Hair et al., 2010).

Factor analysis is used to clarify the potential dimensions results by the creation of appropriate parameter estimation. Also, by defining the link between variables, factor analysis provides a basis for other multivariate approaches. Reducing highly correlated variables to new variables is feasible. While conducting an EFA, a sample size of 100 or even more than 200 should be used (Hair et al., 2010).

This thesis applies the maximum likelihood factoring method, a standard factor analysis, as the primary extraction method for the following reasons (Hair et al., 2010). Firstly, in contrast to the principal factor method, the maximum likelihood factoring method generates a better value in a large sample size than the principal factor method, and the maximum likelihood has desirable asymptotic properties. Most statisticians prefer using maximum likelihood factor analysis over principal factor analysis because the former relatively involves a multivariate normal distribution (Hair et al., 2010). Secondly, in contrast to principal component analysis, which ponders the total variance (i.e., standard, unique and error variances), the maximum likelihood method explores just the common variance (Hair et al., 2010; Tabachnick and Fidell, 2013). Thirdly, the maximum likelihood factoring technique considers the correlation matrix as a sample correlation matrix. Fabrigar et al. (1999, p.277) claim that if the data are moderately customarily distributed, the maximum likelihood technique is the preferred method as "it allows for the computation of a wide range of indices of the goodness of fit of the model and permits statistical significance testing of factor loadings and correlations among factors and the computation of confidence intervals". According to Pallant (2020), scholars advise employing three tests to support the assessment relating to the number of factors to maintain or extract: Kaiser's criterion (KMO) test of sampling adequacy and, the screen test and parallel analysis.

3.8.2 Reliability and Validity

The goodness-of-fit criteria and one-dimensionality were utilised to assess the measurement model and its specification. However, one dimensionality was assessed with reliability tests (i.e., composite and Cronbach's alpha reliabilities) and factor loadings for each component separately. Reliability refers to 'an assessment of the degree of consistency between multiple measurements of the variable' (Hair et al., 2010). Testing the same measurements multiple times to ensure that the responses do not differ at different times is one technique to assess the

reliability of the data. Internal consistency reliability is the second and more used reliability metric. The correlation between different items supports an instrument's internal consistency (Ursachi, Horodnic and Zait, 2015). If several variables that are presumed to measure the same construct and produce similar scores, then internal consistency is met. Internal consistency can differ from zero to one for computing Cronbach's alpha (Ursachi, Horodnic and Zait, 2015). Convergent and discriminant validity tests were used in addition to reliability testing. Hair et al. (2010) suggests two validities, convergent validity, and discriminant validity, to assess the construct validity. Fornell and Larcker (1981) and Hair et al. (2010) explained that consistent internal validity between each construct item (i.e., high and low correlations) is called "convergent validity". This research assessed convergent validity based on the estimated coefficients of each measurement scale (including composite reliability, average variance extracted and Cronbach's alpha). On the other hand, discriminant validity refers to 'the degree to which two conceptually similar concepts are distinct' (Hair et al., 2010, p. 771). A low correlation between the measures is also predicted to assure that the scales are distinct from one another (Hair et al., 2010).

3.8.3 Structural Equation Modelling

SEM is "a statistical methodology that takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon" (Byrne, 2010). According to Byrne (2010, p. 3), the term SEM follows two important characteristics of the technique: (a) "that the causal processes under study are represented by a series of structural (i.e., regression) equations, and (b) that these structural relations can be modeled pictorially to enable a clearer conceptualization of the theory under study". Therefore, this study used SEM to test its hypotheses and validate its proposed conceptual model. The SEM technique has two different multivariate techniques: CFA and structural model (multiple regression analysis). CFA is used

when the researcher is familiar with the structure of the underlying latent variables. On the other hand, the structural model, is used to empirically test the relationship between the various factors as hypothesised in theory. The outcome shows how the theory, and the actual facts compare and fit together.

The evaluation of model fit may be done using a variety of fit indices. Byrne (2010) recommended that a scholar does not need to report a whole set of fit indices, mainly because indicators have been shown to operate somewhat differently given the sample size, estimation procedure, model complexity, and/or violation of the underlying assumptions of multivariate normality and variable independence. This research focuses on three types of goodness-of-fit criteria: absolute, incremental, and parsimony fit indicators (Byrne, 2010). Absolute fit indices are used "to measure the overall goodness of fit for both the structural and measurement models collectively" (Hair et al., 2010, p. 746). The difference between absolute fit and incremental fit is that the absolute fit indices consider a particular model's goodness of fit independently from any other model (Hu and Bentler, 1995). However, incremental fit indices are applied for "assessing how well a specified model fits relative to some alternative baseline model" (Hair et al., 2010, p. 749). Parsimony fit indices are used "to measure of overall goodness-of-fit representing the degree of model fit per estimated coefficient" (Hair et al., 2010, p. 710). These measures complement the other two types of goodness-of-fit measures (the absolute fit and incremental fit measures). Parsimony fit indices "attempts to correct for any overfitting of the model and evaluates the parsimony ration of the model compared to the goodness-of-fit" (Hair et al., 2010, p. 710). Parsimony ratio refers to the assessment of the degrees of freedom (*df*). Between a specified model and the total number of degrees of freedom available (Hair et al., 2010).

Table 3.15 summarises the main goodness-of-fit criteria that have been applied in this research.

Table 3. 15 Model fit criteria. Created from Hair et al. (2010) and Byrne (2010)

Fit Indices	**Shortening**	**Type**	**Tolerance level in this research**
Alpha Coefficient	α	One-dimensionality	α > 0.7 adequate and
Standardized Regression Weight	β		> 0.5 is acceptable
Chi-Square (with associated degrees of freedom and probability of significant difference)	χ 2(df, p)	Model fit	p > 0.05 (at α equal to 0.05 level)
Normed Chi-Square	χ2/df	Absolute fit and model parsimony	1.0<χ2/df <3.0
Normed Fit Index	NFI	Incremental fit, compare your model to baseline independence model	Values above 0.08 and close to 0.90 indicate acceptable fit
Non-Normalised Fit index	NNFI		
Comparative Fit Index	CFI		
The Goodness-of-Fit Index	GFI	Absolute fit	≥0.90
Adjusted Goodness of Fit	AGFI		≥0.90
Root Mean Square Residual	RMR		< 0.05
Root Mean Square Error of Approximation	RMSEA		< 0.08
Parsimony Normed Fit Index	PNFI	Parsimony Fit	Values above 0.08 and close to 0.90 indicate acceptable fit

Absolute Fit Measures:

From table 3.15, Chi-square (χ 2) is a "statistical measure of difference used to compare the observed and estimated covariance metrices. It is the only measure that has a direct statistical test as to its significance and it forms the basis for many other goodness-of-fit measures" (Hair et al., 2010, p. 706). Degrees of freedom (*df*) in SEM models are "the number of nonredundant

correlations or covariances in the input matrix minus the number of estimated coefficients" (Hair et al., 2010, p. 707).

Goodness-if-fit (GOF) is used to measure showing how well a specified model replicates the covariance matrix between the indicator variables. The Goodness-of-Fit Index (GFI), this statistic is indirectly sensitive to sample size because of N on sampling distributions. Values greater than 0.90 is considered goof for assessing measurement validity. An adjusted goodness-of-fit index (AGFI) aims to adjust for varying levels of model complexity. AGFI values are normally lower than GFI values in amount to model complexity (Hair, et al., 2010). Neither GFI nor AGFI is associated with any statistical test; only recommendations for fit exist.

Normed χ 2 is another absolute index. This GOF metric is a simple ratio of χ 2 to the degrees of freedom for a model. χ2/df ratios on the order of 3:1 or less are usually correlated with better-fitting models, except in situations with very large samples.

Fit may be thought of as how well each term is anticipated if a researcher considers each individual covariance or variance term as a distinct value that will be predicted. Each covariance term's prediction error produces a residual. The root mean square residual (RMR) is "the square root of the mean of these squared residuals: an average of the residuals between individual observed and estimated covariance and variance terms" (Hair et al., 2010, p. 747). When covariances are used as input, the RMR, is the mean residual covariance and is given about the scale range of the measures. Therefore, it is challenging to evaluate RMR results from one model to another unless the results are standardised.

Root mean square error of approximation (RMSEA) is a measure that seeks to adjust for bias of the χ 2 GOF test statistic to disqualify models with large samples or large number of observed variables. RMSEA value is debatable but typically values are below 0.10 for most

acceptable models. A confidence interval may be constructed based on the range of RMSEA values for a specific degree of confidence, which is one of the main benefits of RMSEA. Researchers can thus state that they have a 95% confidence level that the RMSEA is between 0.03 and 0.08 (Hair et al., 2010).

Incremental Fit indices:

Normed fit index (NFI) is one of the unique incremental fit indices. It is the ratio of the difference between the fitted model's value of χ 2 and a null model divided by the null model's value of χ 2. It spans from 0 and 1 and a model with perfect fit would result in an NFI of 1 (Hair et al., 2010).

Comparative fit index (CFI) was resulting from NFI index to include model complexity in a fit measure. The CFI is standard so that values range between 0 and 1, with higher values representing better fit.

Parsimony Fit Indices:

Parsimony normed fit index (PNFI) adjusts the normed fit index by multiplying it times the parsimony ratio. The values range between 0 and 1. High PNFI values indicate a considerably better fit. In addition to selecting simpler models, the PNFI shows certain additional traits of incremental fit indices compared to absolute fit indices. The PNFI are used to compare one model to another with the highest PNFI value.

3.9 Ethical Considerations

Ethics is defined as the moral standards or principles that serve as a code of conduct's foundation. Research ethics are concerned with how research is carried out and how the findings are presented (Collis and Hussey, 2014). Bell and Bryman (2007) highlight the significance of moral concerns when people participate in research. During the process, the researcher should be aware of and avoid ethical problems. Some ethical considerations include:

- **The well being of participants:** throughout the research process it is important to ensure the physical and mental health of both the researchers and participants.
- **Dignity**: it is important to maintain both the dignity of the study as well as that of the participants and the researchers.
- **Informed consent:** participants in the study must give their informed permission to take part in the study.
- **Privacy:** it is important to consider people's privacy and how that may effect your research.
- **Confidentiality**: when conducting research you should ensure all information gathered from participants is handled in a confidential manner, and only those with a need to view the data are given access to it.
- **Anonymity**: data should be anomonised before it is analysed in order to protect a users anonymity.
- **Deception and misrepresentation**: when talking with people it is very important not to deceive participants in terms of what will happen to the data collected. There is also a possibility that a participant may deceive a researcher in order to present themselves in a better light.

- **Affiliation**: researchers and participants should be aware of any affiliations that may effect the impartiality of a study. Such conflicts of interest should be declared early on, and mitigations put in place to address them.

- **Honesty and transparency**: the requirement for openness, honesty, and trust in the dissemination of findings to all parties interested.
- **Reciprocity:** the study should benefit the researcher and the participants, or there should be active involvement or some other type of partnership.

Many universities, according to Collis and Hussey (2014), have their own research ethics rules. The Brunel University Code of Study Ethics, Version 10, is a handbook that aims to assist staff and students in striking a balance between preserving the rights and dignity of study participants. This book also offers a welcoming ethical setting for university researchers who want to push the limits of human knowledge. All Brunel researchers are required to read Research Integrity Online Training and pass the accompanying quiz within the first or second year of their studies.

In addition, other sources, such as Brunel University London Code of Research Ethics (https://www.brunel.ac.uk/research/Research-Integrity/Research-Ethics) is available for researchers to achieve a balance between safeguarding the dignity and rights of the research participant. So, the researcher read the handbook and passed the quiz after completing the nine months review within the first year of the study and prior to the collection of data.

Appendices A, B, C, D present letters of approval for the research study.

3.9.1 Ethics Permission for Collection of Yammer Data

After completing the Brunel University Code of Ethics quiz, the researcher aimed to collect web posts from the current ESNs in two universities (University One and University Two). Before data collection from Microsoft Yammer could start, permission was needed from the Ethics team at Brunel University. This was applied for via the Brunel Research Ethics Online (BREO) website and the following details were required: details of the study, supervisors' details, and responses to human participants questions. These were then reviewed and signed by the supervisor of the research. After submission, the researcher was contacted by the Ethics team and asked to clarify a few points. This included confirmation of permissions from the Admins of the Yammer groups to use the posts, and that data collected contained no personal data (anonymised data). Evidence was provided and permission was then granted by the Ethics team to continue with the research.

In order to maintain the confidentiality/anonymity of companies and participants the researcher looked at the literature to find best practice. Collis and Hussey (2014, p. 33) show that confidentiality of organizations participating in studies can be maintain by use of "labels" rather than their trading names. For example using University One, Two, Three etc.

3.9.2 Ethics Permission for Focus Group

After completing the data collection and analysis of web posts in University One, the researcher realised there was a need for a group discussion with active Microsoft Yammer users to address the issue of low engagement on the platform and identify factors influencing the use of ESN between consumptive and contributive users. In addition, data triangulation in this research provides a more comprehensive understanding by combining knowledge gathered from many viewpoints and promoting the examination of emerging discrepancies.

Before advertising the focus group on the current ESN platform and the university home page, the researcher applied for permission via the BREO website and the following details were required: details of the study, supervisors' details, and responses to human participants questions. The researcher also prepared the documents required for obtaining permission before the data collection. These documents included an advertisement and an invitation, a low-risk study document and the participants' information sheet.

In the participant information sheet, the following information was provided: the title and purpose of the study, the invitation paragraph, the reason for participating, the type of participation, the pros and cons of participating in the focus group, and how the data collected was to be processed (confidentiality and anonymity concerns) and how the results of the focus group are shared.

According to Collis and Hussey (2014), one of the basic principles is that no one should be forced into participating in the study. In addition, it is also advised against using money or other forms of material benefit to entice participants in academic studies because doing so would produce biased results. Finally, it is essential to let people know what is expected of them and how much time it will take if they choose to participate. Consent is occasionally delayed because prospective participants need to approach their line manager for approval or because the request needs to be accepted by a committee. Therefore, in the participant information sheet for the focus group, the researcher clarified that participating in the group discussion is voluntary, and that the participants could deliver valuable information to help understand what drives academic staff to continue using ESN platforms.

All social scientists have been under growing pressure to maintain the anonymity and confidentiality of research participants to avoid negative consequences such as harassment (Bell and Waters, 2018). Therefore, all participants in the study should, by default, be given

anonymity and confidentiality. By providing the option to remain anonymous, participants are guaranteed that their identities will not be associated with any of the ideas they express.

Confidentiality means protecting the information provided by participants of the study from other parties, while anonymity applies to preserving an individual's or an organisation's reputation by hiding their names or other identifying information (Bell and Waters, 2018). By reassuring participants of both their confidentiality and anonymity they are more likely to give an open and honest response within an "interview setting" (such as a focus group) (Collis and Hussey, 20174, p. 33). However, in some studies it can be useful to record the "job role" of a participant (for example administrator or academic) in order to achieve the research aims and objectives. In such cases - as with this research - it is imperative that participants give informed consent for the "job role" information to be collected (Collis and Hussey, 20174, p. 33).

The confidentiality of participant identities and confirmation of their data security (i.e., their data would not be passed to a third party) were guaranteed by the researcher. Therefore, in the participant information sheet for the focus group, the researcher clarified that all responses would be kept confidential. As the focus group was tape-recorded, the original tape was destroyed after transcribing and removing any identifiers. After reviewing and signing the application with the supervisor, the application was reviewed and approved by the ethics community.

The researcher received 16 responses to the call for volunteers to participate in the focus group - only 12 of which were in scope for the study. On the day of the group discussion, all participants received the consent form and the participant information sheet prior to start the discussion. The participants read and signed the consent form and then the discussion started. In order to ensure the participants were comfortable (mental wellbeing) with what they had said during the discussion they were given the option to withdraw their comments from the

study. If they chose to do so, their comments would not be transcribed from the tape recording. For this study no-one felt the need to withdraw their comments from the discussion, showing that they were all comfortable in the focus group setting. This was important as it meant the integrity of the responses were likely to be honest and open with little to no deception, and therefore would mean a good "dataset" of information was gathered for analysis.

According to Charmaz (2014) the most significant ethical challenge for theory development is informed consent, which may require a researcher to go above and beyond to obtain consent or to remove non-participant comments. Informed consent should not be a one-time activity at the beginning of a project, but rather a continuous and agreed process throughout the project. After analysing the focus group discussion, the results of theoretical coding in this study were shared with the majority of participants (not all participants were interested). The researcher asked if they were satisfied with the results or had any comments. No-one objected to the way the theoretical coding was done or had any comments - allowing for all the data collected to be used in the study (i.e., no one withdrew their comments).

3.9.3 Ethics Permission for Survey

The online survey was the last stage of data collection in this study. By end of January 2020, the researcher applied for permission via the BREO website, and the following details were required: details of the study, supervisors' details, and responses to human participants questions. The researcher also prepared the documents required for obtaining permission before the data collection. These documents included an advertisement and an invitation, a low-risk study document and the participants' information sheet.

In the participant information sheet, the following information was provided: the title and purpose of the study, the invitation paragraph, the reason for participating, the type of participation, the pros and cons of participating in the survey, and how the data collected was

to be processed (confidentiality and anonymity concerns). In the participant information sheet, the researcher clarified participating in the survey is voluntary and responding to the survey does not take more than 5 minutes. The supervisor reviewed and signed the application and approval was granted for this study by ethics community in early February 2020.

Participants responded via an online survey. Online surveys challenge typical research ethics guidelines such as consent, confidentiality and anonymity, and bring on new theoretical challenges involving data collection, and sampling procedures (Buchanan and Hvizdak, 2009). Scriven and Smith-Ferrier (2003) briefly suggested that participant confidentiality, anonymity and secrecy issues, treating survey invitations as junk mail or containing viruses, and the requirements for data protection all have a potential effect on data value and rates of response. Furthermore, metrics to secure information, such as encrypting data, should be considered. Simsek and Veiga (2001) further point out that to increase both responses and data integrity (such as answers to difficult topics), scholars must create a bond with survey participants and clarify the aims of the research, how a participant is picked, how data will be used and who will have access to it, all of which can be done as the survey emerges.

The survey in this research was conducted through the web-based Survey Monkey, which has some benefits such as easier access, the avoidance of input and data coding errors, faster distribution and saving time and cost (Alessi and Martin, 2010). Survey Monkey has the ability to collect IP addresses, which helps to decrease the likelihood of multiple submissions. If duplicate responses from the same computer have been received, the address can be blocked, or the website will recognise and not allow them to resubmit the reactions. Moreover, in order to increase the anonymity of respondents, this research disables cookies on Survey Monkey. Cookies are used to record and collect personal data from website visitors (Alessi and Martin, 2010).

The introductory page of the survey explained what participation would involve and outlined the safeguards in place to protect the confidentiality/privacy of participants and the benefits of participating. The survey used informed consent, wherein answering the survey indicated consent as long as the necessary information about the study was provided. The introductory page stated that advancing to the survey meant consenting to participation, and those not wishing to participate should not proceed to the next page. All participants were also informed that their participation in this research was voluntary and that they could withdraw from the study at any time.

Once the survey finished and responses were received the IP addresses were removed from the data set. The only "personal" information kept was the age-range and job role data which as outlined above was required for this study, and informed consent had been received to collect.

3.10 Summary

This chapter explained the main methodological foundations and research design of the current thesis. This chapter discussed the main steps used in constructing the extended UTAUT model, from the data collection to analysis stage.

Three data collection methods were performed in the research design: web posts, a focus group, and a main survey. The research instruments were adopted from the existing literature (Venkatesh et al., 2003; DeLone and McLean, 2002; Bock, Sabherwal and Qian, 2008; Bock et al., 2005; Kügler and Smolnik, 2014). The sampling techniques and questionnaire design were discussed. Data analysis techniques (qualitative and quantitative) were introduced. Finally, the chapter ended with ethical considerations for three methods of data collection.

Chapter Four: Data Analysis and Results

Chapter Four: Data Analysis and Results

4.1 Introduction

This chapter presents the qualitative and quantitative data analysis of this study. Therefore, it is divided into two main parts. Firstly, the chapter explains how the qualitative data analysis has been conducted by means of web-posts conversations and focus group with academic staff in higher education in the UK. The purpose of this analysis is to identify generative mechanisms (in real domain) that produced pattens of events observed in the empirical domain. The qualitative data were analysed with the NVivo software. The initial nodes were developed with this programme and then transformed into themes and categories by applying sorting strategies proposed by Adu (2017). The conceptual model was developed based on the existing literature and qualitative data findings.

Secondly, this chapter presents the quantitative data collected and analysed using a survey. This part is organised as follows. First, the preliminary data are then examined. After that, the following section analyses the demographic profile of the respondents and the descriptive statistics. To evaluate the current scales in a different setting and to extract components for all variables, exploratory factor analysis using maximum likelihood factorising and varimax rotation methods for the extended UTAUT constructs was used. In the next section, the CFA is discussed for all constructs. Thereupon, the path analysis and hypothesis testing are presented. Finally, the chapter presents the testing for multi-group invariance analysis.

4.2 Qualitative Data Analyses and Findings

The following section presents the development of genre categories for both universities (University One and University Two). The genre repertoire presents the role of Microsoft Yammer in both universities and how this platform helped faculties to communicate about

work-related and leisure matters in universities. After that, the chapter presents focus group analysis and the relationships between major categories and subcategories.

4.2.1 The Development of Genre Categories within the University One

The qualitative analysis software NVivo was used for coding and studying for two years of web posts. The coding process included sorting data in line with the genre. A group discussion is a sequence of communication paragraphs among individuals (Krippendorff, 1980). Each user's reply or post signifies a unit. An evolving coding method was then implemented, by which groups formed a preliminary unbiased view of the web conversations. Two coders developed a set of specific coding plan instructions to confirm the reliability of the data. A third coder prepared these instructions until the reliability requirement was met. The steps in the evaluation procedure initially included creating a set of elements as a parts of a worksheet. The coders then assessed notes, and resolved any disagreements that appeared on their list. Each coder assessed and coded the posts. This established excellent reliability in a pretest. There were many training sessions for the two leading raters, who also engaged in numerous training coding meetings.

Coder one is the researcher in this study, and coder two is an academic staff member who collaborates with researchers across management and engineering disciplines in the global supply chain management field. Coding these data into related genres involved a logical procedure of reviewing the coding schemes utilised. Two coders were engaged in separately coding the posts, with the third coder being employed to code problematic posts independently. Any alterations to the checklist and directions were received through the pilot test. For instance, accurately classifying the analysis component is a vital first phase of rules necessary for the logical review of qualitative data (Holsti, 1969 cited in Srnka and Koeszegi, 2007, p. 36). The analysis component evolves tacitly rather than being established explicitly (Srnka and

Koeszegi, 2007). Which coders act as the source for coding and the subsequent analysis depends on the data and the research objectives. As mentioned in the literature chapter, one of the features of Microsoft Yammer is contrary to the limits enforced by Twitter: messages are not length constricted. Many of the posts on Yammer have a long text. However, there was a discrepancy between the two main coders.

Coder one believed that each comment or response would represent one unit for analysis. In contrast, Coder two chose "thought units" (a chunk of text) (Srnka and Koeszegi, 2007, P. 36). Srnka and Koeszegi (2007) defined "thought units" as each thought element expresses one concept spoken by the author. Coder two considered all responses (threads) to each post as one unit despite the fact that if there were more than one answers to a post, the response's content represented the job's topic. Therefore, two coders were trained to break up the text notes independently. Following the earliest turn of unitising, the coders calculated the intercoder reliability measures. After the first analysis in University One, Gentzkow's U equalled 0.06172, which was not satisfactory. Thus, two main coders applied a "negotiated agreement" approach for assessing intercoder reliability and resolving any discrepancies. A third coder unitised the posts and compared them with other coders. Any disagreements were discussed and reconciled. After running the second round of unitising in University One, Gentzkow's U score reached 0.95. Coder one and coder two set about developing genre forms just as the following rule. While nearly all posts have one goal and are thus considered an illustration of one genre, many of the extended posts spoke for different communicative incidents and therefore included more than one, sometimes several, cases of various genres. In following this, two main coders discussed any differences or commonalities in groups, and disagreements were settled by either adding a new genre, dividing the remaining one or merging two classes, or recoding earlier coded posts.

Furthermore, the kappa coefficient was utilised to determine the coding agreement between the two coders who coded and rated the messages (Srnka and Koeszegi, 2007). Many researchers consider qualitative methods to be unsystematic and not rigorous enough to deliver consistent outcomes (Scott-Parker et al., 2012). Qualitative processes require innovative practices that are genuinely tricky to measure, and the value of the product alters to a great extent how methodical the researcher is in analysing qualitative material (Scott-Parker et al., 2012). Wide-ranging attempts have been made to build valid and reliable processes for qualitative study (Srnka and Koeszegi, 2007), and different standards for the assessment of qualitative research have been suggested (e.g., Caracelli and Riggin, 1994).

Gentzkow's U and Cohen's kappa are cases of such standards that have been frequently employed and have proved helpful for establishing intercoder consistency (Caracelli and Riggin, 1994). Cohen's kappa applies consistency metrics that determine consistency based on observable agreement versus chance agreement to assume full application of codes (Scott-Parker et al., 2012). If the consistency was not considered acceptable, the former steps were repeated until coders established reliability. Firstly, the two raters independently allocated a code to each component using these genre types. However, some units represented more than one single genre category. Following this initial major coding round, two main coders estimated Cohen's kappa to verify intercoder consistency. The simple story of Cohen's kappa suggested by Brennan and Prediger, (1981) was applied and is illustrated below:

Equation 1 Cohen's kappa

$$\kappa = (\Sigma \text{ Pii} - \Sigma \text{ Pi x Pi}) / (1 - \Sigma \text{ Pi x Pi})$$

Source: Brennan and Prediger (1981)

Σ Pii is the studied percentage of the arrangement, and Σ Pi x Pi signifies the possible agreement percentage (Holsti, 1969). Two main coders found a relatively low coding correspondence level and two main coders credited this disappointing value to the considerable number of classifications and revealed that the early edition of the coding scheme could be improved. Two main coders systematically compared the two coders' initial coding results to establish the classes' theoretical incisiveness and detect possible concerns for improvement in the coding procedure. For this reason, two main coders created the intercoder reliability matrix and employed it in both the genre categories. Table 4.1 presents the results for intercoder consistency matrix of University One. Therefore, two main coders calculated Cohen's kappa using Microsoft Excel is a statistic that evaluates inter-rater reliability, and it can be used with nominal and ordinal levels of measurement. Thus, in a second round of calculating kappa, two main coders reached an excellent rate. A value above 0.5 is a moderate agreement between the raters, but any amount above 0.8 is remarkable (Srnka and Koeszegi, 2007). The rate was exactly 95.16%, so coder one and coder two could argue this is an excellent inter-rater agreement. Thus, after developing the intercoder consistency matrix to 81.08% of the agreement, two main coders calculated the kappa, an excellent rate.

Table 4. 1 Results for intercoder consistency matrix (University One)

Coder 1 / Coder 2	Call	Call info	Updated info	Join	Event	Brokerage	Report access	Threads	Agreement	
Call	148	10	3	0	0	1	0	0		162
Call info	1	84	0	0	0	0	0	0		85
Updated info	3	4	59	0	0	0	0	0		66
Join	0	0	0	147	0	0	0	0		147
Event	0	0	0	0	68	0	0	0		68
Brokerage	0	0	0	0	0	4	0	0		4
Report access	0	0	0	0	0	0	27	0		27
Threads	0	0	0	0	0	0	0	9		9
Agreement									546	568
	152	98	62	147	68	5	27	9		

Agreement
Disagreement
Totals

4.2.2 The Development of Genre Categories within the University Two

Following that, this thesis applied the same procedure for developing genre categories for the university two. Two coders created specific coding plan guidelines to confirm the reliability. A third coder prepared these instructions until the reliability requirement was met. Two coders were involved individually in coding the posts, with the third coder being used to code problematic posts alone. Any changes to the checklist and directions were accepted through the pilot test. However, there was no discrepancy in classifying the analysis component between the two main coders. The posts and replies were short, and each coder believed that each post or response would represent one unit for analysis. Furthermore, all posts had one goal and were considered an illustration of one genre. Subsequently, two main coders discussed differences in groups and disputes by either adding a new genre, dividing the remaining one or merging two classes, or recoding earlier coded posts. For instance, the coder one coded threads as discussion genre categories and divided them into two subcategories: opinions and contents. However, coder two grouped all replies relating to "call for opinion" as one category and the rest of the replies into the "discussion" category. Two main coders created the intercoder reliability matrix following the first coding round and applied it to the genre categories. Two main coders estimated Cohen's kappa to verify intercoder consistency. Two main coders found a moderate agreement (82.25%). Table 4.2 presents the results for intercoder consistency matrix of University Two. Therefore, coder one and coder two applied a "negotiated agreement" approach for assessing intercoder reliability and resolving any discrepancies. A third coder coded the problematic posts and compared them with other coders. A third coder agreed to group all replies into the "Discussion" category and divided them into "opinions" and "contents". Finally, an intention-orientated genre arrangement was created around seven key genres from posts over two years within the university two

Table 4. 2 Results for intercoder consistency matrix (University Two)

Coder 1	News	News-Meet ups	News-Updates	Discussion- Opinions	Discussion-Content	P-A Selling	P-A. Sports	P-A Asking for a Specific Info	P-A Societies	P-A polls	Call for Opinion	Social & Praise	Personal Offer	Informal Talk	Total
Coder 2															
News Info	218	0	0	0	0	0	0	0	0	0	0	0	0	0	218
News Meetups	0	113	0	0	0	0	0	0	0	0	0	0	0	0	113
News Updates	0	0	29	0	0	0	0	0	0	0	0	0	0	0	29
Discussion – Opinions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discussion – Contents	0	0	0	0	62	0	0	0	0	0	0	0	0	0	62
P-A Selling	0	0	0	0	0	135	0	0	0	0	0	0	0	0	135
P-A Sports & Other Activities	0	0	0	0	0	0	43	0	0	0	0	0	0	0	43
P-A Asking for Specific Info	0	0	0	0	0	0	0	82	0	0	0	0	0	0	82
P-A Societies	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7
P-A Polls	0	0	0	0	0	0	0	0	0	11	0	0	0	0	11
Call for Opinion	0	0	0	189	0	0	0	0	0	0	17	0	0	0	206
Social & Praise	0	0	0	0	0	0	0	0	0	0	0	33	0	0	33
Personal Offer	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50
Informal Talk	0	0	0	0	0	0	0	0	0	0	0	0	0	191	191
Agreement	218	113	29	0	62	135	43	82	7	11	17	33	50	191	991
															1180

Agreement
Disagreement
Totals

4.2.3 Findings: Genre Repertoire - What Do Users Do in Yammer? (University One)

For genre grouping, an intention-orientated genre arrangement was created around eight key genres that appeared from posts over two years within the University One. The arrangement is intended to show how and why Yammer participants employed the platform and which types were most productive. Table 4.3 illustrates an outline of the intention-oriented categorisation arrangement from the University One.

- **Call**

This genre is undoubtedly the most widespread (accounting for 27% of genre appearances); it signifies the user's intention to invite applicants to submit their proposal for different work programmes. The 'Call' category includes an invitation to apply for various funded working programmes, information about schemes aims, requirement criteria, eligibility, budget, and the closing date for submission of proposals. Furthermore, the author calls for fellowships/studentships or other research staff interested in collaborating with other researchers to get a grant or award. The results show that members use Yammer to share open calls, partner searches and general news from different independent research organizations, businesses, and charities for funded projects.

- **Join**

The second-biggest category relates to the group "Join" and represents 26% of genre appearances. Join is an automatic Yammer post to welcome a newcomer to Yammer. Since Yammer was launched in 2014, the platform still gets new members daily, which reflects its initial slow take-up but growing awareness across the university.

- **Call Information**

Seventeen per cent of all genre appearances reflect the unique scheme's information to audiences. The contributor provides primarily information about the proposal draft, advice about research activities and opportunities, rewards, and financial information about the call. One of the distinctions between Yammer and Twitter is that Yammer messages are not length restricted. Thus, many posts shared by the users were too long, and most of the professional opportunities contained information about the call. As mentioned earlier, some posts fit into two or more categories; many posts represented a call and the call information. The evidence demonstrates that university users have adopted a social networking tool to promote forthcoming research calls and research activities. Table 4.4 displays a typical example of a call and call information post.

- **Updated Information**

This category represents 11% of genre attendances and considers genres that aim to deliver others with work-related updates about work programme updates and changes to different scheme topics. Most messages in this category refer to changes in forthcoming work programmes in different research interests and improve the descriptive texts for some calls. Also, contributors updated their audiences about general news for researchers, such as the Researchfish tool and ResearchGate updates.

- **Event**

This genre category represents 12% of all genre appearances. This category contains upcoming seminars, conferences, webinars and meet-ups for researchers, and these messages can be linked to the Call group. The contributor shares the date, time, and location for events and provides a link to register for them. Furthermore, the university offers many training sessions

on writing successful proposals for researchers to promote these meet-ups through Yammer for academic staff and researchers. Table 4.5 is an example for an upcoming event for finding partnerships.

- **Report Access**

The category "Report Access" accounted for 5% of all genre appearances. The contributor provides a link to get a report or proceedings, such as research statistics and conference proceedings. For instance, a user shares a link to get news about proposals accepted by sponsors and grants awarded during a year.

- **Brokerage**

Here 1% of genre appearances captured Brokerage posts related to the Open Info Day that they offer to help with funded research opportunities. All Brokerage posts are linked to upcoming events. The user intends to invite researchers to register the event to obtain funding for their project, get the latest news on the specific work programme, discuss it with the community, find a suitable partner for their application and be informed about the application process.

- **Threads**

The last category, "Threads", represents 1% of all genre appearances, and the posts take part in interactive discussions in which users ask about work-related matters or engage in clarifying various issues of interest. This category represents 1% of genre appearances, showing the low engagement between members and the barriers to freely expressing their opinions or enquiries on the platform. The following chart indicates the number of posts categorized by genres.

Figure 4.1 presents indication of full genre selection, with proportion dissemination in University One.

Table 4. 3 An overview of genre categories (University One)

Main categories	Definitions
Call	The author invites applications to be submitted and shares information about deadlines and criteria for proposals.
Join	An automatic Yammer post to welcome a newcomer to Yammer.
Call info	The author primarily advises about research activities and opportunities, rewards and financial information.
Updated Info	The author shares an update about the work programme scheme, an event that already happened, and general research news such as new systems and policies.
Event	The author shares the location and time of events (meet-ups, conferences and webinars), and they can be linked to Call.
Brokerage	The author offers to help with the call.
Threads	A series of messages were sent between one or more users about the specific topic under a post.
Report Access	The author shares a link to get a report/proceeding (research statistics, conference proceedings).

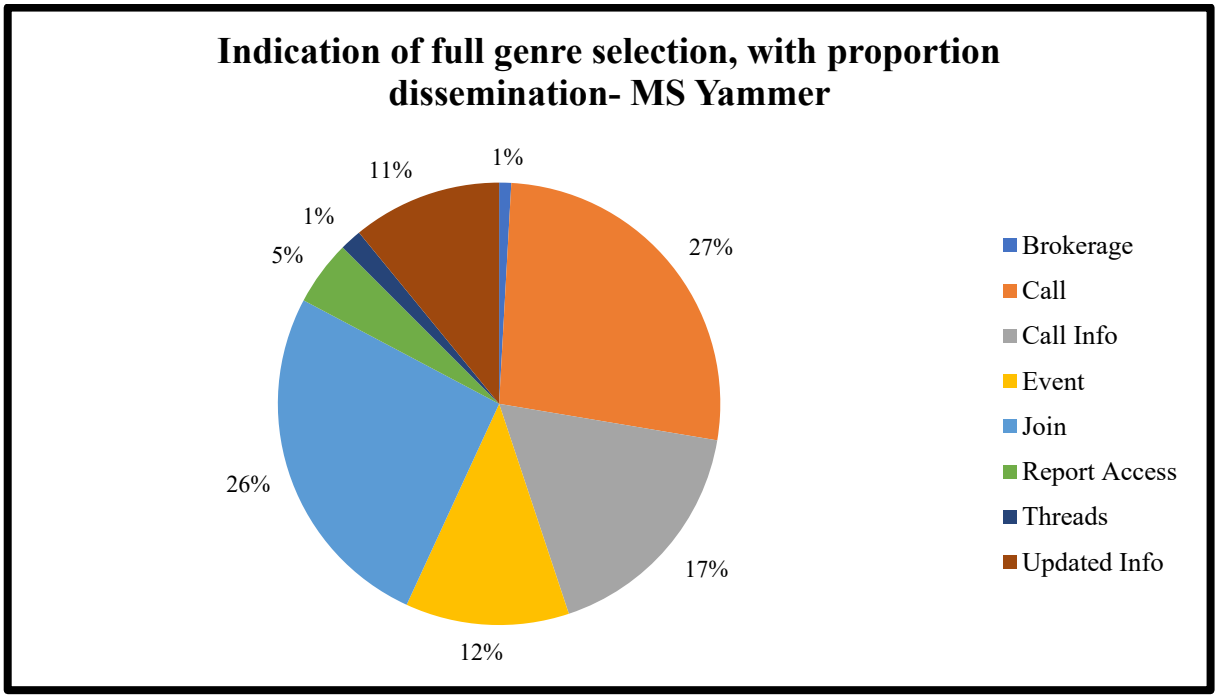

Figure 4. 1 Indication of full genre selection, with proportion dissemination- MS Yammer (University One)

Table 4. 4 An example of web posts for upcoming calls (University One)

A Post from MS Yammer	Genre Categories
Research administrator – July 12 at 12:10 PM The British Academy: Knowledge Frontiers – International Interdisciplinary Research 2020 The British Academy is inviting proposals from UK-based researchers in the humanities and social sciences wishing to develop international interdisciplinary projects in collaboration with colleagues from the natural, engineering and/or medical sciences, with a focus on hazard and risk, cultures of forecasting and the meaning of resilience. The purpose of each project will be to develop new international research ideas. Projects will need to also demonstrate an innovative and interdisciplinary partnership (between researchers in the social sciences or the humanities on the one hand and counterparts in the natural, engineering and/or medical sciences on the other). The academy is looking to fund applications that break new ground in the collaborations – international and interdisciplinary – they support and the research they aim to undertake. The Academy particularly encourages applications led by scholars in the humanities. The deadline for submissions and UK in imitational approval is 23 October 2019 at 17.00 (UK time). Value and duration awards of 24 months in duration and up to 200,000 pounds are available. Funding can be used to support research expenses and consumables; travel and subsistence; networking, meeting and conference costs; and research and/or clerical assistance (postdoctoral or equivalent). Awards are offered on a 100% full economic costing basis. Projects must begin on 1 April 2020. https: // www.thebritishacademiy.ac.uk/ Seen by 3	Call Call Information

Table 4. 5 An example of web posts for upcoming events (University One)

A Post from MS Yammer	Genre Categories
Research administrator -June 26 at 11:04 AM Societal Challenge 5 Information Days – Registration Open Registration is now open for the Information Days on H2020 Societal Challenge five: "Climate Action, Environment, Resource Efficiency & Raw Materials", which will take place on 16 and 17 September 2019 in Brussels. The session itself, organized by EASME, targets applicants for the 2020 calls for project proposals and participation is limited to two individuals per organization. Registration closes on 8 September 2019. Once registered, attendees have the opportunity to design their own programme agenda as well as utilizing a match-making facility that will enable them to schedule bilateral meetings and to present their interests, expertise and/or project ideas to possible project partners. Further information is available on the Information Days website. Please contact us if you wish to attend this event.- Hhttps://h2020-SC5-info-day.b2match.io	Event

4.2.4 Findings: Genre Repertoire - What Do Users Do in Yammer? (University Two)

For genre grouping, an intention-orientated genre arrangement was created around seven key genres that appeared from posts over two years within University Two. The perceived genres present profound perceptions of the university's use of Yammer for "communication". In addition, the genres offer insight into why and how the academic staff use Yammer and the character of enterprise social networking in the university. Table 4.6 outlines the intention-oriented categorisation arrangement from University Two. Figure 4.2 and Figure 4.3 review the various genres counted for seven top classifications that reflect the types of posts and communication generated on the platform.

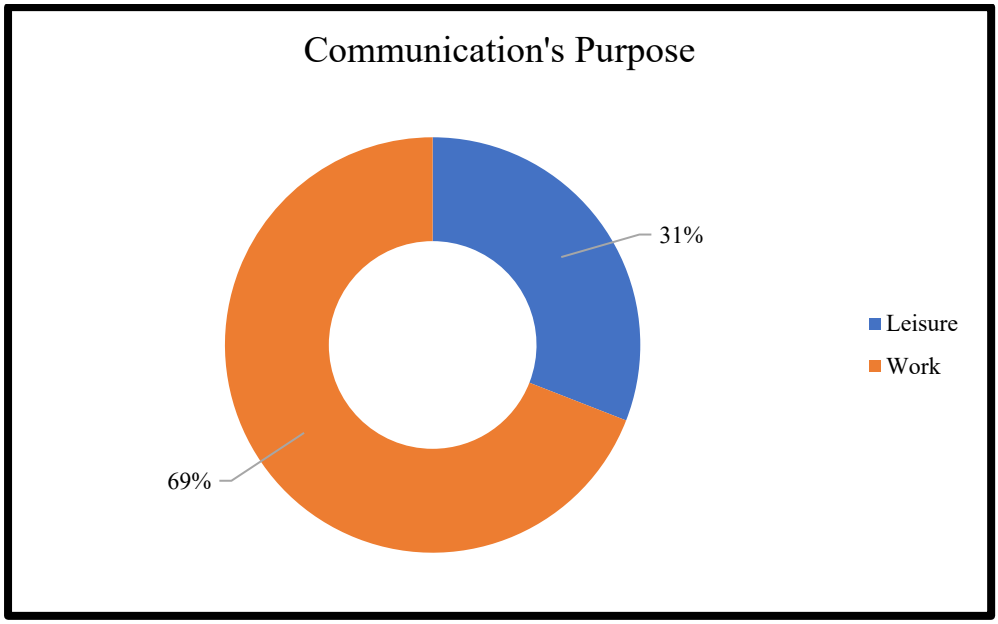

Figure 4. 2 Types of communication purposes within University Two

Table 4. 6 An overview of genre categories (University Two)

Genre Categories	Subgenres	Definitions
News	Information	The author provides general news about activities that happen inside of the university. In some cases, the author tries to promote different opportunities such as job vacancies, services, and useful links for staff's career.
	Meet-ups	The author shares time and location for upcoming meetings, gatherings, and events, inside or outside the university's campus. They might seek a response.
	Updates	The author shares an update about an event or a meeting that has already happened inside or outside the university's campus.
Discussion	Opinions	The author offers their opinion or judgment on various matters during discussion (this category finds threads where users are discussing and suggesting their opinions).
	Content	The author provides facts to a discussion (this genre is less about personal assessments and more about contributing facts to a discussion).
Personal Enquiries and advice	Selling, borrowing, donating, discussing issues and lost items	The author asks a question for specific information and seeks a response: in some cases, such as a request for selling, borrowing, or donating items; in other cases, such as a call for specific information about issues or discussing problems inside the university's campus.
	Sports and other activities	The author asks a question about planning activity and seeks a response.
	Asking for specific information, procedure, guidelines, a person to contact/teaching	The author asks about specific information, procedures or looks for connecting. In some cases, the author asks a question about learning, such as new technology, new language, etc., and seeks a response.
	Societies	The author asks about upcoming dates for different societies and seeks a response.
	Polls	The author takes a vote and seeks answers.
Call for opinion		The author asks for some advice about things she/he is doing.
Social and praise		This category consists of messages where users thank somebody for their contributions, or in many cases, the author thanks the person who organised an event before.
Informal talk		This genre includes informal communication about clearly non-work-related matters. This type of conversation happens in leisure group activities.
Personal offer		The author offers prizes for competitions, free or discounted tickets, etc.

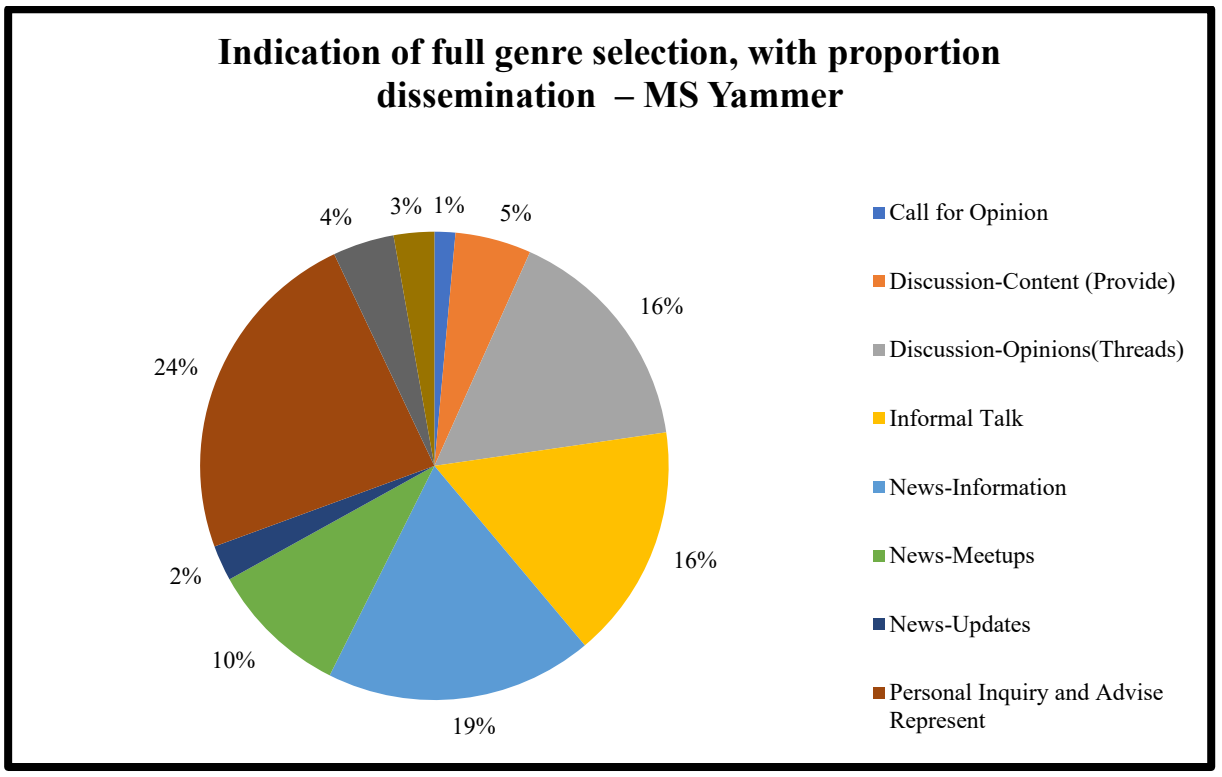

Figure 4. 3 Indication of full genre selection, with proportion dissemination- MS Yammer (University Two)

- **Personal Enquiry and Advice**

The most common genre (category) was termed "personal enquiry and advice". The category makes up 24% of all assigned genre codes and includes five subgenres. The biggest subgenre, representing 8.59% of genre instances, is called "personal enquiry and advice (sale, donate, borrow, lost items and issues)", assigned when an author asks for specific information and seeks a response: in some cases, such as a request for selling, borrowing or donating items; in other cases, such as reporting issues or discussing problems inside the university's campus, and always a lot of advice and help were given by other users. The many posts included a user raising an issue they had with the temperature in the laboratory, and another who wanted to borrow a lab device for her lab test; following those posts, other users were happy to help them with their requests.

Users use Yammer for sharing and discussing general departmental matters and information. Another 2.78% were coded in the same category, representing personal enquiries asked by staff, and there was no reply to them. Another type of personal enquiry was asking for specific information such as a procedure, guidelines or looking for a person to contact, and advice was always given by specialists or authorities who covered 5.81% of genre occurrences. Although 1.52% were coded in the same category, those posts were left without responses. Usually, this category is dedicated to work-related topics. For instance, users from the Chemical and Molecular Science group asked questions about a person's need to make contact regarding some issues in the lab or a procedure for transporting samples across departments. Another category, "other activities", comprised 3.62% of the genre appearances. These activities are more recreational and related to non-work matters such as planning to go somewhere to eat or visiting a museum, which covers 1.85% with responses to the posts and 1.77% without response. Other types of enquiries made by users were asking questions about upcoming dates

for different societies and seeking a response, which includes 0.34% with replies and 0.25% without replies. In the last category of personal enquiries, members take a vote and seek a response consisting of 0.93% of genres instances.

- **News-Information**

The second-most common category is sharing information with a proportion of 19% that can be both work-related and non-work-related matters. The author gives general news about activities that happen inside of the university. In some cases, the author tries to promote different opportunities such as job vacancies, services (food catering) and useful links for staff's career. Some 81.1% of the information shared by the users was about work-related matters, and 18.9% of the information shared by the users was about leisure topics. The fundamental notion is that users tend to provide information that they believe might be useful for others. For instance, in the Office 365 tips and tricks group, users share general news and information about integrating Microsoft Teams and Yammer or the importance of information governance and data protection in the university.

- **News- meet ups**

Another category of news is about upcoming meetings, gatherings, seminars, or workshops at the university, with a proportion of 10% of all genre instances. The author aims to provide the time and location for events inside or outside of the university's campus, and they usually look for a response. Thirty-seven per cent of posts and messages were dedicated to recreational meet-ups, and 63% of posts were about work-related meet-ups such as seminars, workshops, and events inside or outside the university. Table 4.7 presents an upcoming training programme about an information asset owner role for staff at the university. It provides times and locations for the training events.

- **News- updates**

The last category is "news updates" about events or meetings that have already happened inside or outside the university's campus, making up 2% of all assigned genre instances. All 30 posts address updates about work-related topics.

- **Informal talk**

The third-largest category, with 16%, is “informal talk”. This genre includes informal communication about clearly non-work-related matters. This kind of conversation happens in leisure group activities in threads. Typically, those comments are embedded in non-work-related conversations. For instance, people talked about joining the evening events, crafting events, finding a mate, learning a new language, or collecting fossils at the seacoast and other activities.

- **Call for opinion**

The category “call for opinion” represents 2% of all genre instances. This category comprises posts where users ask for an opinion and seek a response. Therefore, users offer their opinions or judgments on various matters during the discussion. Table 4.8 presents a call for opinion and discussion- opinion categories, a user, seeks some advice about a webinar application.

- **Discussion – opinion**

This category is related to the comments given under requesting opinion posts. All opinions are embedded in work-related conversations. For example, one of the users requested opinions about building a long-term catering strategy for food and drink at the university. The user listed all changes and explained the current plan about food and drink offerings at the campus, but to improve and provide more healthy food options, the user asked people's opinions and many

other users suggested their ideas about food and drinks offered at the campus. This category comprises 16% of comments or opinions given to the posts.

- **Discussion – content (provide)**

The category "discussion – content (Provide)" represents 5% of all genre instances. Here, messages are about providing facts to a discussion. This genre is less about personal assessments and more about contributing facts to a discussion, such as providing links or references or adding more information to the topic.

- **Personal offer**

The category "personal offer" makes up 4% of all genre instances. In this category, the author offers prizes for competitions, free or discounted tickets, etc. Usually, this category consists of sharing non-work-related information. Seventy per cent of this category is related to leisure activities such as discounted or free theatre tickets, etc. Thirty per cent of this category is related to work topics such as offering spare old keyboards or monitors, cupboards or prizes for competitions.

- **Social and praise**

The category “social and praise” represents 3% of all genre instances. This category consists of messages where users thank somebody for their contributions. For instance, one of the users who held a gathering for staff shared some updates about the event, and other users who attended the gathering appreciate and thank her for organising that event.

Table 4. 7 An example of news meet-ups (University Two)

A Post from MS Yammer	Genre Categories
User A April 26 at 11:25 AM. Announcement: **Information Asset Owner Training Course** Want to know what's expected of the Information Asset Owner role? Need to perform a Data Privacy Impact Assessment? Have a requirement to use the Information Asset Register? Then you should attend the IAO training courses being run in ICT Training Room 204, Central Library, at the following times: Tuesday 1st May at 0930 – 1130 Thursday 3rd May at 1430 – 1630 Thursday 17th May at 1430 – 1630 Tuesday 5th June at 1200 – 1400 To reserve your place at one of these training events please email us. Comments: **User B** April 26 at 11:26 AM How long is a session? **User A April** 26 at 11:26 AM Apologies – all sessions are scheduled for 2 hours	New-meet ups Personal Enquiry

Table 4. 8 An example of call for opinion and discussion – opinion (University Two)

A Post from MS Yammer	Genre Categories
User D March 9 at 8:59 AM. Hi – Can anyone recommend a good webinar application? Two main coders have a service request where the client is looking for an application for a webinar where both the speaker and most attendees are external to ICL. Due to this, Skype for Business and Panopto are out of the question. With minimum of 30 people attending and probably more as she would like it to be open to the public. Thanks. **Comments:** **User E** March 9 at 9:23 AM Hi user D, I have personally used gotomeeting.com many years ago with 10 people without any problems and some areas of college use this website: go to meeting. Com **User F** March 9 at 9:23 AM Hi user D, In Business School two main coders also use GotoWebinar, and I can assure you that all Business School teams regularly praise it. Present to hundreds with confidence and attend a webinar from anywhere. See why Got Webinar platform is rated #1 in customer satisfaction. www.gotomeeting.com **User G** March 9 at 10:57 Hi, in the Graduate School two main coders have used GotoWebinar which was great very flexible, however, two main coders have just switched to running our webinars through Adobe Connect which is a different approach but is great too. **User H** March 10 at 11:06 AM Every webinar I've attended in the last year has been through GotoWebinar as well – it has been very reliable and very accessible from a user's point of view. As a side note, recommendations from a recent seminar: zoom.us (a flexible competitor to Skype for business) and Chromacam from Personify (allows the presenter to be on screen with their slides while broadcasting, like a green screen). I have not tested it, but it may be useful to people looking to engage in new webinar styles. **User D** March 12 at 11:55 AM Thanks for all the replies. They were all very helpful. **User E** March 12 at 12:03 AM Welcome :-) btw maybe worth chatting to ICT's Microsoft guru to see whether this could be a use case for Office 365 Teams now access to it is being opened up to guests (i.e., not just those with a college Office 365 (Azure Active Directory) account.	Call for opinions Discussion-opinion

In summary, Yammer is used within University Two to provide a range of services to support staff with their enquiries, sharing and updating general departmental information. The topics that users share and discuss on the platform are safe, and they learn valuable and exciting things besides their main task in the university. These everyday activities include learning about how to control and keep their information asset at the universities, learning new features of digital

apps (e.g., Yammer, Teams) and webinar apps, discussing and raising awareness about vehicle security, raising their issues and enquiries about lab facilities or getting guidance about their work. Furthermore, people use Yammer for planning recreational activities such as crafting and sports classes, networking, advertising, or promoting leisure events and competitions inside or outside of the university.

4.2.5 Focus Group Analysis and Findings

Factors affecting ESN use are mainly obtained through the focus group discussions. Relevant data on critical factors influencing ESN use were collected from the focus group discussion. The second question asks:

- What are the motivators for, and barriers to, using ESNs among academic staff in higher education?

The data were collected, and the two main coders refined the focus group plan according to the analysis result and built principles by following the tag on-demand design without infinite refining until no more new themes could be found in the focus group (Charmaz, 2014). Text data were analysed and sorted via NVivo 11, a professional qualitative research software.

4.2.5.1 Open Coding

At this stage, researchers remain open to exploring whatever theoretical opportunities they can identify in the data. The openness of initial coding should spark thinking and allow new ideas to emerge. Initial coding should stick closely to the data. It is essential to look closely at which coding actions reduce tendencies to code for types of people. In this study, coder one and coder two coded the data separately and then compared and combined the codes to evaluate their fit and usefulness. Glaser and Strauss (1999, cited in Charmaz, 2014, p. 120) showed how coding with gerunds helps scholars detect processes and stick to the data. Open coding is a method of

"breaking", "training" and reblending data files and abstracted concepts that aims to regularly theorize and categorize data sets (Charmaz, 2014).

The size of the unit of data used to code matters. There are two types of coding at this stage: word-by-word coding and line-by-line coding. Scholars with interests in phenomenology may find word-by-word coding a complementary coding strategy. Word-by-word coding forces a scholar to attend to images and meanings. Other grounded theorists employ line-by-line coding. Line-by-line coding means naming each line of your written data (Charmaz, 2014). Coder one and coder two aimed to scrutinise persuasive events and analysed what caused them and how they happened. Coder one used line-by-line coding, allowing the coder to take compelling events apart and analyse what constitutes them and how they occurred. While coder two was coding (segment by segment) the focus group data, coder one took a close look at what participants said and seemed to struggle with and the third coder was employed to code problematic posts independently.

In this study, all focus group "content" was organised and analysed according to a grounded theory process, which involved continuously developing core concepts and extracting influencing factors through three stages initial coding, focused coding, and theoretical coding. First, by forming and analysing the original data on twelve respondents, the two main coders combined initial thoughts just as the frequency of responses to questions and the thoughts from focus group discussions, continuously proposed tags, extracted concepts and shaped categories, which finally led to the extraction of 217 initial codes.

Next, this research further identified the following categories: developing the common ground, building person perception, timely knowledge sharing, building a friendship, open calls, emotional anxiety, disbenefits-diving behaviour, resisting engagement on the platform, lack of knowledge, lack of time, low quality of content, feature value, information value, continuous

awareness programme, top-down management pressure, students' influence on staff use behaviour, praising and the age matter. Finally, table 4.9 presents some responses about how Microsoft Yammer helped them in knowledge sharing and research opportunities (Initial coding).

4.2.5.2 Focused Coding

This phase means simply selecting and going forward with the codes that most interest the scholar and it is straightforward and proceeds quickly. Focus coding requires decisions about which initial codes make the most analytic sense for categorising the data incisively and completely. Comparing codes with codes heightens the sense of the direction in which the analysis is going and clarifies the theoretical centrality of certain ideas (Charmaz, 2014). Strauss and Corbin (1997) presented a third type of coding, axial coding, to relate categories to subcategories or generate themes. The aim of axial coding is to sort, synthesise and organise large amounts of data and reassemble them in new ways after coding (Tashakkori and Creswell, 2007). This research has employed the axial coding procedure for generating themes by using a sorting strategy to generate themes. It followed the coding procedures by Charmaz (2014), and Adu (2017), which significantly helped with some difficulties in sorting and synthesising data.

These two coding processes required constant deliberation and comparison of concepts and categories established based on open coding to do a further summary, where essential concepts were associated, and the most important categories were summarised according to their connotations and relationships. These selected factors were more significant than other codes or more frequent among initial codes. Moreover, this thesis employed a sorting strategy (Adu, 2017) to find the selected codes. During the process of generating categorisations, this study

assessed the characteristics of each code in terms of its meaning, its frequency, its generality, and its representation (Adu, 2017).

Before agreeing on the developed themes, there was a discrepancy in some categories. During the focus group discussion, research administrations stated that academic staff avoid exchanging information about research calls on the platform. Instead, they contacted via private channels, including email, message or in person. Therefore, coder one categorised them into " resisting engagement on the platform". However, coder two stated this behaviour refers to their figurative culture. Dutch (2013) used the term "figurative," as it relates to culture, to describe the process through which societies anticipate the future and adjust to change. To solve the discrepancies, coder three coded agreed and categorised them as "resisting engagement on the platform". In addition to the sorting strategy, contrary to coder two, which counted that theme twenty-four times, coder one found that "resisting engagement to the platform" counted for twenty-seven.

Another disagreement between the two main coders was "the lack of organisational pressure". According to Venkatesh et al. (2003, p. 453), facilitating conditions are defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system. Coder one categorised the data into low facilitating conditions, and coder two categorised them into " the lack of organisational pressure". Coder three agreed with coder two categorisation because the use of ESNs was voluntary in the organisation; there was no pressure to use ESNs. Therefore, the researcher changed it to " the lack of organisational pressure".

Finally, coder one coded fear of giving opinions, being nervous, having no experience, working environment, worrying about expressing ideas, and low engagement into "disbenefits- diving behaviour". According to Zhang et al. (2020), diving behaviour as "users reduce their social

participation to only browsing and checking of relevant messages without making responses or with reluctance in expressing their personal opinions or views in public due to their higher degree of concerns for their values and privacy". Although it did not sound familiar coder two, after negotiating with coder three, all coders agreed to categorise them into "diving behaviour".

In order to test the reliability between the two main coders' agreements, Holsti suggested coefficient reliability which is the ratio of coding agreements to the total number of coding decisions (1969, p. 136).

The formula is: *Equation 2 Coefficient reliability*

$$C.R. = \frac{2M}{N1 + N2}$$

In this formula, M is the number of coding decisions the two coders agree on, and N refers to the number of coding decisions made by coders 1 and 2, respectively. Following that, two main coders estimated the coefficient reliability in Microsoft Excel that evaluated inter-rater reliability, and two main coders found a moderate agreement (88.24 %). Therefore, coder one and coder two applied a "negotiated agreement" approach to assessing intercoder reliability and resolving discrepancies. Next, a third coder coded the problematic statements and compared them with other coders (e.g., resisting engagement to the platform, the lack of organisational pressure and diving behaviour).

As mentioned above, coder three agreed and coded fear of giving opinions, being nervous, having no experience, working environment, worrying about expressing ideas, and low engagement into "disbenefits- diving behaviour". Then, two main coders estimated the inter-rater reliability, an excellent rate (94.12%).

This research extracted factors from the focus group discussion following that principle and acquired 14 categories or themes. By exploring connections between those 14 themes and through further summarisation and combination, this research obtained four significant categories or theoretical codings – motivator, barrier, outcome, and strategy. The following tables (table 4.10 table 4.11, table 4.12) present the sorting strategy to develop themes.

Appendix L presents the complete analyses of focus group data through initial coding and focused coding to develop themes and categories. The negotiation between the main coders is attached in appendices M and N. Appendix O presents the calculation of reliability test for coding the focus group discussion.

4.2.5.3 Theoritical Coding

This stage shows how the substantive codes may connect as hypotheses to be integrated. At this stage, the researcher organised the relationships among selected categories by further summarising and refining theoretical coding, focusing on selected categories to reach a maximum analysis, and defining the relationships between selected categories and theoretical codes. This thesis conducted an additional constant study on 14 categories formed through focused and axial coding and determined significant influencing relationships between motivator, barrier, outcome and strategy through the coding. The relationship between major categories and subcategories are illustrated in Table 4.13. The relationship structures of major categories are illustrated in Table 4.14. Furthermore, the procedure of coding for all the focus group data can be found in Appendix L. Coder's two notes and Analyses are in Appendices M and N. Figure 4.4 presents the blueprint for the qualitative study of this research. It is built from the blueprint for the qualitative study of Srnka and Koeszegi (2007).

Table 4. 9 An example of initial coding and focused coding to extract factors influencing the use of enterprise social networking (focus group)

How has Microsoft Yammer helped you today?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
1	For me, Yammer is not necessarily about today but specifically my collective experience using Yammer at the university; it helped in disseminating and sharing timely information with the audiences in research and the development support office worked with. That is one of our keys uses and two main coders found out that it is a helpful platform to communicate information in a timely way, knowing that it is safe and secure, that it can be viewed only by members of our community within the university.	My collective experience, Used the platform for a long time Disseminating and sharing timely information, Sharing research calls and news, Communicating in a timely way Safe and secure platform, Viewed only by university members	Sharing timely information (3) Safe and secure platform (2) Promoting funding opportunities and news (5)
2	So today, I have not particularly used it. But since I started university in November, I found from Yammer myself that two research academic audiences are using the platform. I started using Yammer 10 days ago and created a group "Project Management and Change Management across the university" 10 days ago. Two main coders have got 45 members now. People are really scared about putting opinions on the platform, because they are never about what they say.	Heard about Yammer from academics Recently joined, Created own group with my colleagues	Communicating promptly (3) Collaboration (4) Building a friendship (4)

Table 4.9 An Example of Initial Coding and Focused Coding to Extract Factors Influencing the Use of Enterprise Social Networking (Focus group) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	But my experience about using Yammer is that it has already started to help the group to collaborate and connect people from different sides or areas of the university, because I am quite good at Yammer and I know how to work well with Yammer and I will be chatting about one of my projects. How it helps me is in collaboration, because basically you can share files, you can do polls, you can do more social interaction, so you can keep it more casual in the forms of communication. So, in terms of collaboration in a group, it really does help people to meet each other and coexist with a regular in-person network… running… So, if you do not meet a person, in person, it helps you to build a friendship with them.	Being scared to contribute on the platform, no experience of using Yammer Being experienced with using Yammer, Training my colleagues Collaboration and building relationships Being professional Collaboration in a group, Meeting new people, Building a friendship	Being scared to contribute on the platform (1) Stop using Yammer (1)
3	To create research awareness: funding opportunities, funder policy, intelligence, university policy, etc....	Creating research awareness ,promoting funding calls, updating funder policy news	Promoting funding opportunities and news (5)
4	Make them aware of research funding opportunities and news from the funder that I manage.	Disseminating information, promoting funding calls	Sharing timely information (3), Promoting funding opportunities and news (5)

Table 4.9 An Example of Initial Coding and Focused Coding to Extract Factors Influencing the Use of Enterprise Social Networking (Focus group) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
5	I use Yammer to disseminate information about funding calls.	Disseminating information, promoting funding calls	Sharing timely information (3), Promoting funding opportunities and news (5)
6	It has not helped me much in my career, just allows me to communicate with colleagues, socializing (recreational activities).	Not help me in my career progression, having communication, Socializing	Building a friendship (4) Socialising (3)
7	I have not used it recently, I used it before (at early stages). Communicating with colleagues and socializing. Then I stopped using it because there wasn't a lot of activity there.	Having communication, socializing, low engagement, left the platform	Socialising (3), Low engagement (1) Stop using Yammer (1)
8	Allows me to communicate with colleagues, social events, etc. (funding opportunities).	Finding funding calls	Funding opportunities and news (5)
9	It helped me find information regarding research funding.	Finding funding calls	Funding opportunities and news (5)

Table 4.9 An Example of Initial Coding and Focused Coding to Extract Factors Influencing the Use of Enterprise Social Networking (Focus group) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
10	It helped me find information regarding research funding. Also, many networking events take in universities. So I can meet new people which help me in my career progression.	Participating in networking events Building a relationship, Future collaboration, Career progression	Funding opportunities and news (5)
11	Find out about H2020 programme, which means I will join the programme to find out more about calls.	Finding funding calls, Joining the work programme	Networking (3) Joining workshops (2) Collaboration (4)
12	It helped me to find out more about upcoming research opportunities, Also, research administrators provide many "writing a successful proposal" workshops, which helps me as a junior researcher applying for grants. Also, many networking (brokerage) events are held in the university. So I can be notified and take part in these events.	Finding funding calls, Attending workshops, Networking events Collaboration	Funding opportunities and news (5) Collaboration (4) Building a friendship (4)

Step Two: Using Sorting Strategy to Develop Themes (Moving from Codes to Categories and Themes)

Table 4. 10 Using sorting strategy to develop themes

Codes	Generality (out of 16 participants)	Frequency
Sharing timely information	3	3
Promoting funding opportunities and news	4	5
Finding funding opportunities	4	4
Communicating promptly	5	4
Safe and secure platform	1	2
Collaboration	5	4
Building a friendship	5	4
Socialising	4	2
Networking	3	3
Joining workshops	2	2
Being professional	1	2
Training staff	1	1
Being scared to contribute on the platform	1	1
Inexperienced	1	1
Low engagement	1	1
Stop using Yammer	1	1

Step Three: Identifying the Dominant Codes + Generating Categories/Themes to Address the Research Questions

Table 4. 11 Identifying the dominant codes

Identifying the dominant codes	Codes
Cluster 1: Funding opportunities and funder policy news	Promoting funding opportunities and news (5) Finding funding opportunities (4) Sharing timely information (3)
Cluster 2: Building a friendship	Socialising (2) Networking (3) Building a friendship (4)
Cluster 3: Collaboration	Joining workshops (2) Collaboration (5)
Cluster 4: Developing common ground	Sharing timely information (3) Communicating promptly (4)
Cluster 5: A confidential platform	Safe and secure platform (2)
Cluster 6: Low engagement	Low engagement (1) Being scared to contribute to the platform (1) Inexperienced (1) Stop using Yammer (1)
Cluster 7: Training staff by professionals	Being professional with Yammer (2) Training Yammer (1)

Step Four: Generated Themes and Categories for the Question "How has Yammer Helped you Today?"

Table 4. 12 Generating themes

Outcome (the key usage of ESN)
1 Funding opportunities and funder policy news- open calls
1.2 Building a friendship
1.3 Developing a common ground
1.4 Collaboration

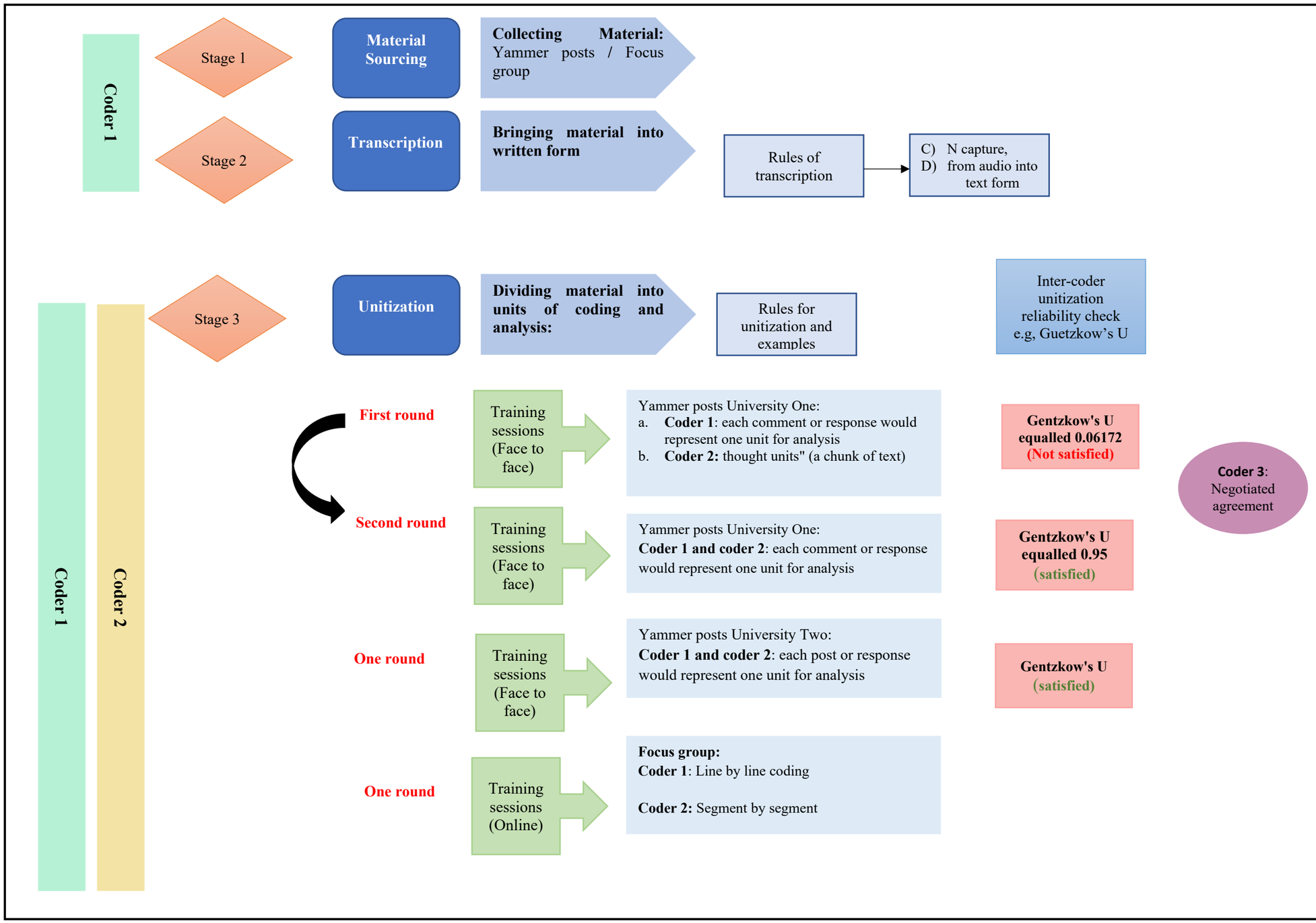

Figure 4. 4 A blueprint developed by two coders for systematic qualitative analysis (genre analysis and grounded theory)- It is built from the blueprint for the qualitative study of Srnka and Koeszegi's (2007).

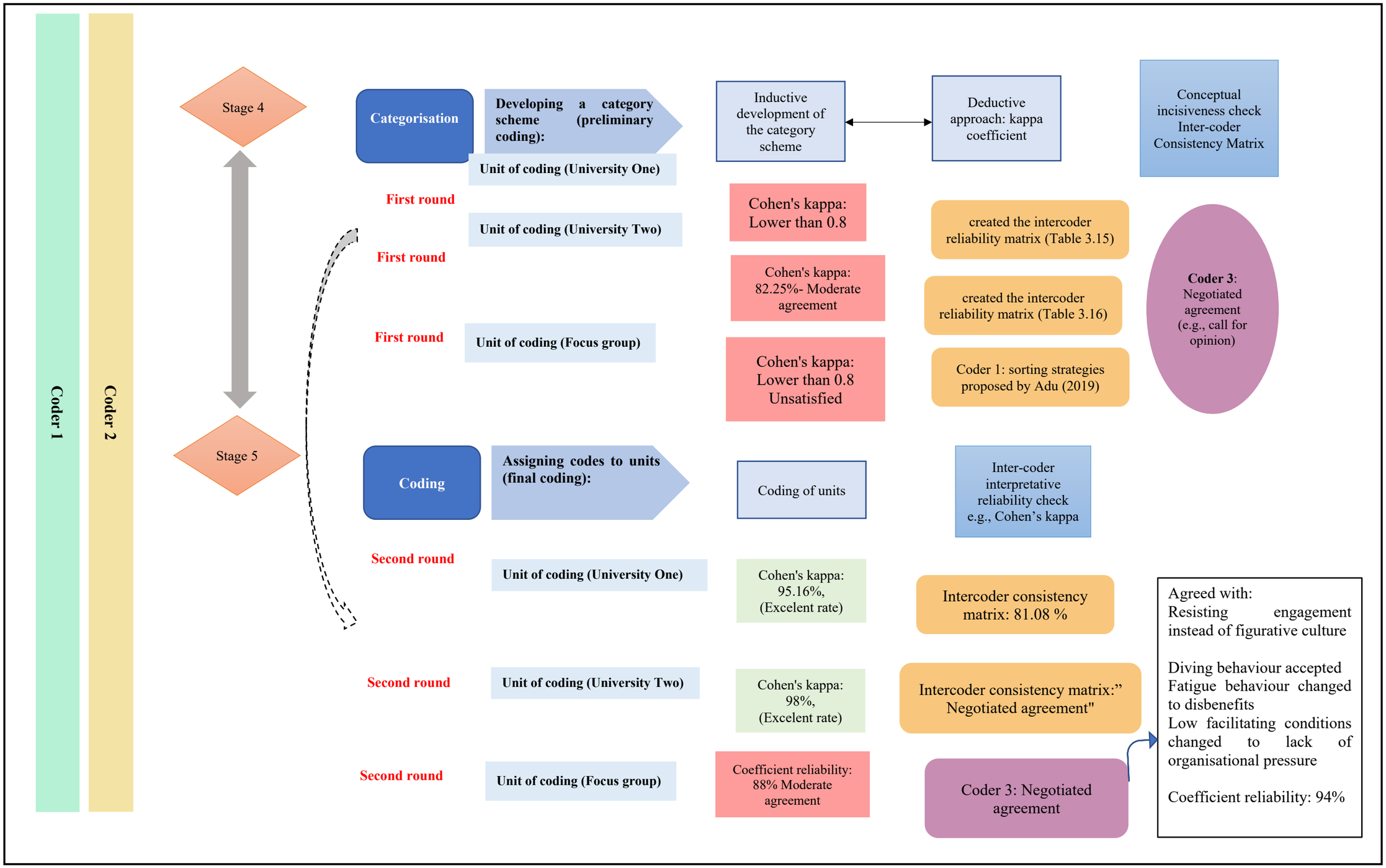

Figure 4. 4 A blueprint developed by two coders for systematic qualitative analysis (genre analysis and grounded theory) It is built from the blueprint for the qualitative study of Srnka and Koeszegi's (2007) (cont.)

Table 4. 13 Relationships between Major Categories and Subcategories

Major Category	Category/Themes	Codes	Connotation
Motivators	**Feature value**	Ease of use	Seen By social tagging, searching stuff by using hashtag, tracing audiences, accessing the group insights, analytics graphs, seeing behind the scenes, storing and sharing files, doing polls, different virtual background playing as a supplement tool, private and secure platform.
	Information value	Information value	Easy to use, instant communication, sharing files, doing teamwork, recording, doing videoconferencing, sharing screen.
	Organizational requirement	Institutional demand	Making bold announcements, keeping short, adding links to it, sharing interesting and relevant topics.
	Adequate organizational and technical support	Adequate organizational and technical support (MS Teams)	Outside collaboration, collaborating with your department, collaborating with whole university, working on projects with Teams, doing big web conferencing, webinars, storing and sharing files, work-related tool.
Barriers	**Resisting engagement on the online platform**	Contacting via private channel	Having a different approach to chatting online, coming in person, a noticeboard, getting a lot of correspondence from outside Yammer, a strong underpinning culture of picking up the phone, walking in or emailing, being comfortable with their habits.
	Emotional anxiety	Emotional anxiety	Feeling scared, low engagement on the platform, nervous, no experience before.
	Loss of knowledge (i.e., intellectual property)	Privacy concern	In the working environment, people are even more scared. Disagree with somebody in a post and upsetting somebody else, maintaining relationships with colleagues in remote working.
	The lack of organizational pressure	The lack of organizational and technical support	No support received from marketing communication, independent training, not being promoted officially, short presentation, small group training, internal event notice, invited interested people, word-of-mouth sharing, invited people with no prior experience. Managing new features (MS Teams), managing IT settings, lack of use, lack of setting some ground rules, self-learning, lack of training, lack of IT support.
	Low content quality	Low quality of content	Low quality of content, large bulk of information, formal language, overwhelmed with information.
	Lack of time	Lack of time	Lack of time to use Yammer, too busy to participate in training (MS Teams), taking time to learn ESN tools.
Outcome	**Benefits**	Developing a common ground	Informal communication, conversation, interactive tool.
		Building a person perception	Getting to know somebody online and meeting them in person.
		Timely knowledge sharing	Sharing ideas, getting feedback, sharing experiences, giving assignments
		Building a friendship	Social interaction, meeting new people, networking.
		Open calls	Looking for an academic position, collaborating on research projects.
	Disbenefits	Diving behaviour and emotional anxiety	Fear of giving opinions, being nervous, having no experience, working environment, worrying about expressing ideas, low engagement.
Strategies	**Improving user engagement**	Training and educating (e.g., continuous awareness programme and producing good content)	Organizing events, getting internal and external speakers, official events for academic staff, continuous awareness training, staff development training courses, individual IT support.
		Top-down management pressure	Managers' support, senior leaders' support, lots of training, giving a clear purpose to using ESN tools, having a target, IS support.
		Students' influence on academic staff use behaviour	A reverse mentoring, giving training to staff by students.
		Praising	Find champions in the University Onend praise, recognition of effort, recruiting influential people.

Table 4. 14 Relationship structure of major categories

Relationship Structure	Definition of Relationship Structure	Typical Statements by Respondents
Motivator- Outcome- Strategy	Feature value (ease of use), information value, adequate organizational and technical support and institutional demand can all directly affect ESN use among academic staff, which leads to sharing information in a timely manner, developing informal communication, building a friendship and finding academic partners for collaboration without geographical limitation. To reinforce, top-down management pressure, constant training, awareness programme and social rewards directly impact academic staff's use behaviour.	**Ex:** I think it does help with searching stuff on Yammer. That is why two main coders encourage using the #hashtag. Because two main coders have used Yammer for many years at the university, and two main coders have many contents and lots of cites. Sometimes with searching some stuff on Yammer, you just have to know what kind of tags you think two main coders would use at University Two and then search for it. **Ex:** I think internal social media tools could be massively beneficial with some sort of training pushed. Also, you know top-down leadership you know, using it, and it would be a real cultural change, it would be a "game changer". **Ex:** The way I am seeing the future is that Yammer eventually becomes internal conversation and is used more for social media in the university, a collaboration between different colleges and different groups of people with interest as a social media type thing. **Ex:** Teams is more…...mm…. so, you could have a team with your department; you can have a team with the whole university. It is more about the department, specifically the projects you are working on and specific collaboration things, academics, and people outside of the university for a certain amount of time.
Barrier- Outcome -Strategy	The lack of institutional pressure, resisting engagement on the online platform, emotional anxiety and loss of knowledge can directly affect ESN use among academic staff, which causes social media diving behaviour. To improve, continuous awareness programme (e.g., safe and secure platform to use), top-down management pressure and social rewards directly impact academic staff's use behaviour.	**Ex:** But in a working environment, people are even more scared because they worry, "Have I said the wrong thing?" or if they just disagree with somebody in a post and they upset somebody else and see then. You just need to encourage people that this is a safe environment that they are in and there are no consequences of an opponent with different opinions. How does it help them? Set some ground rules about the types of things that will not be accepted, e.g., types of language, incidents of cyberbullying or something like that. Just making some expectations about how they expect people to behave in a group and help make some boundaries. **Ex:** People don't know about the system and don't know how to use it. Some people might think social media is not what they are doing at the edge of their work. **Ex:** RESEARCH ADMINISTRATOR has always been a soft open-door policy with the kind of culture where academics are encouraged to come in person because of the relationship and the nature of the work they are doing. **Ex:** At the beginning at Yammer, two main coders had many stupid things, "when you press end, you need to start a new line, you need to post it".

4.3 Quantitative Data Analysis

4.3.1 Preliminary Data Analysis

SPSS has been utilised in this research for several purposes: first, data screening including coding, editing and checking missing data; second, checking the assumptions of normality, multicollinearity and outliers. In doing so, this thesis used the following tests: skewness-kurtosis, normal probability plot, and univariate and multivariate outliers; third, analysing frequencies and mean and standard deviations for this thesis's constructs; fourth, this research conducts one-way ANOVA analysis (Analysis of Variance) to test the effect of the level of consumption of ESN use on the dependent variable (i.e., professional benefits).

4.3.1.1 Data Coding and Editing

A total of 272 responses were collected over three months; then, the next step was to decide how to code or give numerical values to each question before entering the data into SPSS. Therefore, this research created a survey booklet, so all codes were written on the questionnaire. The booklet consisted of seven questions about the background of ESN use within organisations and participants' demographics. These questions produced nominal data, and these values were not ranked. Thus, a different code was needed for all options. For instance, in question one, regarding the participant's gender, male gender was assigned to zero, and female gender was assigned to one. However, question eight uses a Likert scale in which participants were asked to select the response closest to their opinion. This question consisted of 32 statements, and the responses were ranked. The responses range from "strongly disagree" to "strongly agree" with a neutral category in the middle. After coding, all data were entered into SPSS. After data coding, this research conducted data editing to ensure that the coding

process was done correctly. Furthermore, the research double-checked the value by going back to the original questionnaire in case of any out-of-range values.

4.3.1.2 Data Screening

To ensure that all the data were entered correctly and that all the variables were normally distributed. This research conducted data screening to identify any missing data, normality and outliers. The following sections in this chapter explain the preliminary analysis. Furthermore, while reviewing the data, some irrelevant responses were found. Three people outside of the population target (i.e., a businessman, an undergraduate student and a postgraduate student) answered the questions. Therefore, all three rows were deleted from the list. Moreover, ten participants answered “irrelevant” to ESN type, and they chose "other tools" and specified PSNSs (e.g., Facebook, LinkedIn, and Gmail). Therefore, the researcher also deleted these ten respondents out of the list.

4.3.1.3 Treatment of Missing Data

Tabachnick and Fidell (2013) highlight two methods for evaluating missing data when respondents fail to respond to one or more questions in a survey. The first method is related to pattern missing data in which the researcher verifies the source of the missing data founded on random or non-random (i.e., related to specific items) incidence. Therefore, there is no bias, as the missing data are randomly distributed among the questionnaires. On the other hand, the generalidsability of results might be influenced, as the missing data are non-randomly distributed among the questionnaires. However, they highlight that the missing data pattern is more crucial than the missing data.

Data screening of the results of this research, revealed that three rows had incomplete responses, which showed 25% of missing values for each construct of questions. This fell below the 80% threshold, and so these responses were deleted from the data set. This study identified an unengaged answer by calculating the standard deviation among the latent construct of questions. "Be liner" refers to someone who answers the same value for every question. After estimation, there was zero variance on those questions. This study deleted those rows due to unengaged responses. After removing these erroneous data from the data set, the data screening was re-run. The new data set contained less that 5% of missing values for each construct of questions, a percentage that Churchill (1979) considered to be tolerable. Consequently, there was no problem with the data, and the researcher proceeded with further analysis. This research replaced the missing values with the variable mean. Replacing missing data is a best practice based on valid responses (Hair et al., 2010).

4.3.1.4 Assessment of Normality

After coding and screening the data, a normality test was conducted to ensure that the data had not disrupted the normality assumption. The technique for assessing the nature of a data distribution comprised of two tests (Hair et al., 2010): skewness and kurtosis. Skewness is the degree of asymmetry of distribution: how much it is skewed to the left or right (Cain, Zhang and Yuan, 2017). For instance, if the distribution has positively skewed values, the values are clustered to the left of the distribution; this implies a positive skew (Hair et al., 2010). Kurtosis refers to " a measure of peakedness or of heavy tails or of some kind of combination of the two " (Cain, Zhang and Yuan, 2017, p. 416). Positive kurtosis values imply a peaked distribution, and negative kurtosis values indicate a flatter distribution (Cain, Zhang and Yuan, 2017). Table 4.15 presents the research constructs' mean, standard deviation, variance, and skewness. As explained in Table 4.15, the constructs' skewness values were lower than the

cut-off values of +3 and -3. All kurtosis values were also within the cut-off values of +7 and -7 (Curran, West and Finch, 1996). Mardia's coefficient of 114.850 was lower than P*(p+2), p=29. Therefore, the sample data met the standards for univariate and multivariate normality. Furthermore, this research conducted normal probability plots for each construct alone, and the findings still showed no severe deviation from normality.

Table 4. 15 The research constructs' mean, standard deviation, variance and skewness source: Analysis of survey data (SPSS file)

Construct	Mean	Std Deviation	Variance	Skewness		Kurtosis	
				Statistic	Std error	Statistic	Std error
PE1	3.52	.870	.757	-0.376	.153	.043	.304
PE2	3.44	.921	.848	-0.559	.153	-0.035	.304
PE3	3.39	.916	.839	-0.530	.153	.121	.304
EE1	4.02	.800	.640	-0.930	.153	1.402	.304
EE2	4.06	.832	.693	-1.016	.153	1.733	.304
EE3	3.97	.891	.794	-1.298	.153	2.404	.304
SI1	3.50	1.113	1.293	-0.598	.153	-0.334	.304
SI2	3.58	1.085	1.178	-0.691	.153	-0.186	.304
SI3	3.53	1	1.001	-0.672	.153	-0.004	.304
FC1	3.39	1.104	1.220	-0.473	.153	-0.569	.304
FC2	3.33	0.962	.926	-0.249	.153	-0.322	.304
FC3	2.93	1.114	1.241	.064	.153	-0.762	.304
FC4	3.22	.937	.878	-0.143	.153	-0.194	.304
FV1	3.42	.790	.624	-0.307	.153	-0.071	.304
FV2	3.29	.925	.855	-0.309	.153	-0.218	.304
FV3	3.01	.970	.941	-0.199	.153	-0.130	.304
FV4	2.99	1.059	1.122	-.165	.153	-0.703	.304
IV1	3.76	.750	.563	-0.424	.153	.694	.304
IV2	3.63	.860	.740	-0.596	.153	.559	.304
IV3	3.53	.847	.717	-0.422	.153	-0.158	.304
RE1	3.48	1.017	1.033	-0.674	.153	.039	.304
RE2	3.45	.959	.920	-0.814	.153	.139	.304
RE3	3.43	.954	.909	-0.611	.153	.157	.304
CSU1	3.35	1.063	1.131	-0.608	.153	-0.344	.304
CSU2	3.21	1.167	1.362	-0.422	.153	-0.737	.304
CSU3	3.22	.926	.858	-0.384	.153	-0.036	.304
CTU1	3.37	1.113	1.239	-0.555	.153	-0.452	.304
CTU2	3.15	1.069	1.142	-0.369	.153	-0.581	.304
CTU3	3.34	1.039	1.080	-0.703	.153	-0.265	.304
PB1	2.39	1.176	1.384	.416	.153	-0.807	.304
PB2	3.10	1.153	1.330	-0.334	.153	-0.899	.304
PB3	2.29	1.143	1.306	.563	.153	-0.625	.304

4.3.1.5 Assessment of Multicollinearity

Based on the research questions, this research examined two sets of data. The first relates to consumptive ESN use and contributive ESN use. This research has used a correlation coefficient to test the multicollinearity of the relationships among variables . Multicollinearity is defined as an "approximate linear relationship among independent variables" (Liu et al., 2003, p. 141). The collinearity exists once a simple correlation coefficient between two independent variables is significant. SPSS provides collinearity statistics as well as a simple correlation coefficient. Tolerance (t) and variance inflation factor (VIF) are two indications of collinearity among variables (Van Der Kooij, Meulman and Heiser, 2006). Tables 4.16 and 4.17 present the collinearity statistics for consumptive use and contributive use, t = 1-, where is "squared multiple correlations of the variable with other independent variables" (Liu et al., 2003, p. 141). Table 4.16 shows that the t value is small (close to 0); the consumptive use construct is almost a linear combination of the other independent variables. The VIF values are less than three thresholds, which means that these independent variables do not overlap in a portion of variance to explain the dependent variable. Therefore, the results indicate that multicollinearity among extended UTAUT constructs is unlikely. Table 4.17 then indicates that the t value is above 0.1; the contributive use construct is almost a linear combination of the other independent variables. The VIF values are less than three thresholds, which means that these independent variables do not overlap in the amount of variance to explain the dependent variable. Therefore, multicollinearity between extended UTAUT constructs is unlikely.

Table 4. 16 Collinearity tests for consumptive ESN use (dependent variable)

Coefficients								
Model				**Standardised Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
				Beta			**Tolerance**	**VIF**
1	(Constant)	-0.882	0.294		-3.002	0.003		
	PE – - mean	0.093	0.076	0.076	1.230	0.220	0.481	2.079
	EE – mean	0.070	0.067	0.052	1.043	0.298	0.739	1.353
	SI – mean	0.087	0.059	0.092	1.474	0.142	0.466	2.145
	FC – mean	0.049	0.077	0.038	0.633	0.527	0.506	1.975
	IV – mean	0.160	0.103	0.099	1.564	0.119	0.458	2.182
	FV – mean	0.283	0.077	0.207	3.679	0.000	0.575	1.739
	RE – mean	0.474	0.069	0.396	6.862	0.000	0.547	1.829
a. Dependent Variable: CSU – mean								

Table 4. 17 Collinearity tests for contributive ESN use (dependent variable)

Coefficients								
Model				**Standardised Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
				Beta			**Tolerance**	**VIF**
1	(Constant)	-0.830	0.276		-3.005	0.003		
	PE – mean	0.259	0.071	0.222	3.630	0.000	0.481	2.079
	EE – mean	0.104	0.063	0.081	1.644	0.101	0.739	1.353
	SI – mean	0.120	0.056	0.134	2.156	0.032	0.466	2.145
	FC – mean	-0.063	0.073	-0.051	-0.864	0.388	0.506	1.975
	IV – mean	0.261	0.096	0.170	2.708	0.007	0.458	2.182
	FV – mean	0.226	0.072	0.175	3.123	0.002	0.575	1.739
	RE – mean	0.274	0.065	0.242	4.222	0.000	0.547	1.829
a. Dependent Variable: CTU – mean								

4.3.1.6 Outliers and Influential Cases

In examining the constructs, this research identified multivariate outliers concerning the effects of consumptive ESN use and contributive ESN use, as well as the outliers and influential points using Cook's distance test (Cook, 1977). Influential cases can happen because of recording errors. Consequently, the data editing step is a crucial part of the analysis (Cook, 1977). Figures 4.5 and 4.6 illustrate the plotting of those respondents' distances. Although there seems to be some outliers on both graphs, Cook's distance does not declare these points as influential records because Cook's distance < 1. The reason is Cook's distance is influenced by points being outliers on both Y and the predictor, and these points are not outliers on Y.

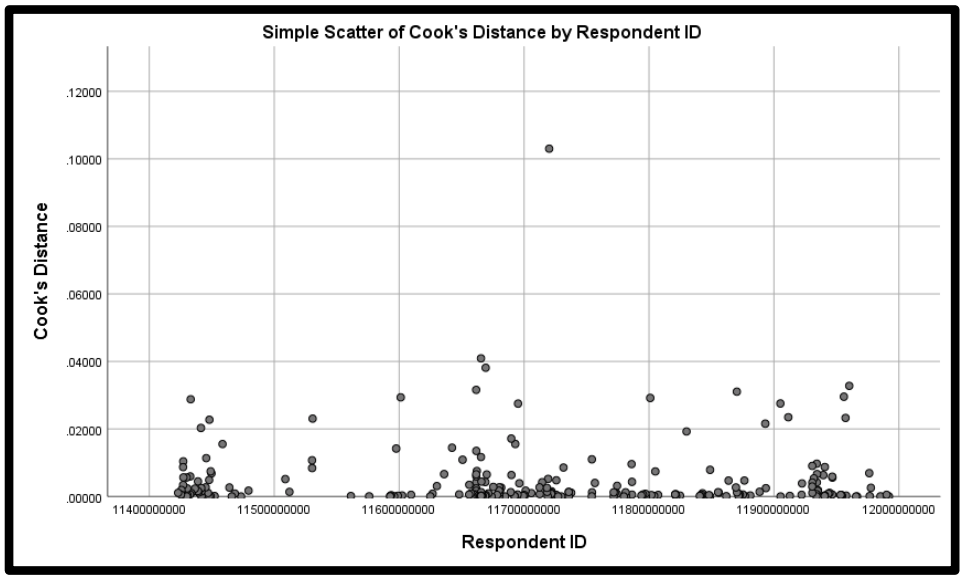

Figure 4. 5 Simple scatters of Cook's distance by respondent ID (consumptive use)

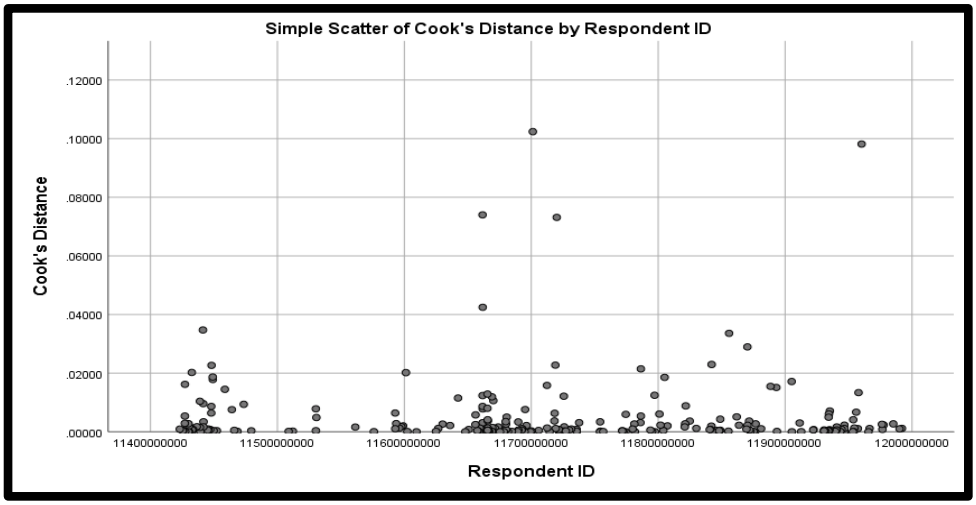

Figure 4. 6 Simple scatters of Cook's distance by respondent ID (contributive use)

4.4 Quantitative Findings

4.4.1 Response Rate

Two hundred and seventy-two responses were received during the data collection, which started on 14th February 2020 and ran until 30th May 2020. Eighteen responses were excluded due to incompleteness or unengagement answers. Two hundred and fifty-four responses were recorded as valid.

4.4.2 Sample Characteristics

Table 4.18 shows the demographics of respondents, including gender, age, academic position, academic background experience, type of ESN tools, number of years using ESN tools and number of times using the tools in a week. Table 4.18 shows the gender balance: male 61% to female 39%. The sample ages ranged as follows: 20 to 34, 57.7%; 35 to 49, 36.6%; and 50 above, 5.9%. As regards academic position, 48% of the sample were doctoral researchers, 11.8% were postdoctoral researchers, 12.2% were lecturers, 5.9% were research

administrators, 2.8% were readers, 3.9% were senior lecturers, 2.8% were professors and associate professors, and 12.6% were other academic staff (e.g., administrators, academic directors, etc.). In terms of academic background experience, 53.1% of the sample had worked at a university for less than five years, and 16.9% and 14.6% had worked at a university for less than ten years and more than ten years, respectively. Academic staff utilised Microsoft Teams and Yammer as the leading ESN platforms (52.4% and 35.8%, respectively). Since ESNs are a new phenomenon, the results revealed that 59.4% of academic staff had used ESNs for less than one year, and 24.4% of them had used ESNs for less than three years. In general, the academic staff role includes teaching, researching, consulting and publishing, as well as knowledge disseminators within universities (Jolaee et al., 2014). Therefore, the majority of communication with others was in person, and 39% of academic staff had occasionally employed these platforms. More than half of the academic staff in the sample utilised these platforms as a part of their work practices weekly and daily (21.7% and 33%, respectively).

Table 4. 18 Demographic profile of participants (source: SPSS)

Demographic Profile of Participants		Frequency	Per Cent	Valid Per Cent	Cumulative Per Cent
Gender	Male	155	61.0	61.0	61.0
	Female	99	39.0	39.0	100.0
	Total	254	100.0	100.0	
Age Group	20–34	146	57.5	57.5	57.5
	35–49	93	36.6	36.6	94.1
	50 or over	15	5.9	5.9	100.0
	Total	254	100.0	100.0	
Professional Position	Doctoral Researcher	122	48.0	48.0	48.0
	Postdoctoral Researcher Fellowship	30	11.8	11.8	59.8
	Research administrators	15	5.9	5.9	65.7
	Other (e.g., Academic Director, etc.)	32	12.6	12.6	78.3
	Lecturer	31	12.2	12.2	90.6
	Reader	7	2.8	2.8	93.3
	Senior Lecturer	10	3.9	3.9	97.2
	Associate Professor	5	2.0	2.0	99.2
	Professor	2	0.8	0.8	100.0
	Total	254	100.0	100.0	
Working at University (years)	Less than one year	39	15.4	15.4	15.4
	More than one year but less than five years	135	53.1	53.1	68.5
	More than five years but less than ten years	43	16.9	16.9	85.4
	Ten years or more	37	14.6	14.6	100.0
	Total	254	100.0	100.0	
Type of ESN Tool	Yammer	91	35.8	35.8	35.8
	Chatter	2	0.8	0.8	36.6
	Slack	22	8.7	8.7	45.3
	Microsoft Teams	133	52.4	52.4	97.6
	Other tools (Zoom)	6	2.4	2.4	100.0
	Total	254	100.0	100.0	
Using the Platform (Years)	Less than one year	151	59.4	59.4	59.4
	More than one year but less than three years	62	24.4	24.4	83.9
	More than three years but less than five years	24	9.4	9.4	93.3
	Five years or more	17	6.7	6.7	100.0
	Total	254	100.0	100.0	
How Often Using the platform	Never	16	6.3	6.3	6.3
	Occasionally	99	39.0	39.0	45.3
	Weekly	55	21.7	21.7	66.9
	Consistently Daily	28	11.0	11.0	78.0
	Frequently Daily	56	22.0	22.0	100.0
	Total	254	100.0	100.0	

4.4.3 Factor Analysis (Exploratory Factor Analysis)

This thesis applied the maximum likelihood factoring method, a standard factor analysis, as the primary extraction method. This research used three tests to support the assessment relating to the number of factors to maintain or extract: Kaiser's criterion (KMO) test of sampling adequacy, the screen test and parallel analysis.

4.4.3.1 Kaiser's Criterion

One of the most broadly utilized methods is Kaiser's criterion, or the eigenvalue rule. Using this law, only factors with an eigenvalue of 1.0 or more are maintained for further examination. The eigenvalue of a factor is the volume of the total variance supported by that factor. In some situations, Kaiser's criterion has been blamed for retaining many factors (Pallant, 2020).

4.4.3.2 Scree Test

Another method that can be applied is Cattell's scree test. This includes plotting each of the eigenvalues of the components and examining the plot to discover a point at which the structure of the curve gives way and becomes flat (Cattell, 1966). Cattell advises keeping all components above the break in the plot, as these components contribute most to the justification of the variance in the data set.

4.4.3.3 Parallel Analysis

An additional method gaining renown, especially in the social science literature (e.g., Choi, Fuqua and Griffin, 2001), is Horn's parallel analysis (Horn, 1965). Parallel analysis compares the size of the eigenvalues with those found from an accidentally produced data set of equal size. Only those eigenvalues that surpass the reciprocal values from the random data set are kept. This approach is considered the most correct in identifying the correct number of

components to keep, and the other two approaches (Kaiser's criterion and screen test) are likely to overestimate the number of factors. Only factors with an eigenvalue of 1.0 or more are maintained for further examination (Pallant, 2020). Field (2005) states that if the number of variables used in factor analysis is less than 30, the sample size is above 250, the average communality is greater than or equal to 0.6 and Bartlett's test of sphericity is significant, then the factor analysis extraction method is acceptable. All the above conditions applied to this research despite the sample size being 254; the KMO of sampling adequacy is 0.911 (i.e., .6 and above is acceptable, according to Kaiser, 1974), and Bartlett's test of sphericity is significant ($p < 0.001$). However, the average commonalities in this research were 0.58, which is a bit lower than Field's (2005) advice as an appropriate ratio. Table 4.19 illustrates the KMO and Bartlett's test. Table 4.20 illustrates the goodness-of-fit test.

Table 4. 19 KMO and Bartlett's test (source: SPSS)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.911
Bartlett's Test of Sphericity	Approx. Chi-Square	4908.280
	df	496
	Sig.	0.000

Table 4. 20 Goodness-of-fit test (source: SPSS)

Goodness-of-Fit Test		
Chi-Square	df	Sig.
454.222	293	.000

4.4.3.4 Factor Loading

This study looked at the previous academic literature to find the appropriate loading between variables and their factors (e.g., Tabachnick and Fidell, 2013; Pallant, 2020). Following previous scholarly literature, the appropriate factor loading between a variable should surpass 0.3 at the 0.05 significance level, based on the sample size. The result of the rotation method showed that SPSS rotated seven factors, all loading above 0.3. The seven factors explained 66.58% of the total variance, with this coverage being more than the recommended minimum of 60%, as suggested by Hair et al. (2010). The most commonly used orthogonal method is the varimax method, which attempts to minimise the number of variables that have high loadings on each factor, and this research used the Varimax method.

However, the extended UTAUT is a hierarchical model, and factor analysis must be done separately. Therefore, after running factor analysis with the maximum likelihood extraction method and varimax rotation while defining seven eigenvalues, the pattern matrix revealed that some variables were not loaded on parental variables. For instance, facilitating condition item one was closely correlated with the social influence component, so the researcher removed it from the rest. Moreover, information value items were loaded low on several different components, so information value items one, two and three were removed from the rest. It is common in EFA to apply rule-of-thumb cut-offs to choose if an item "significantly" weighs on a respective factor, with estimated standardised factor loadings of 0.30 to 0.40 frequently showing a meaningful or essentially significant factor loading (Cudeck and O'Dell, 1994).

Since a scholar usually does not select these cut-offs subjectively, they are often random (Ford, MacCallum and Tait, 1986). Schmitt and Sass (2011, p. 100) state that these rule-of-thumb values are also built on two vital concepts: "(a) the estimated factor loading standard errors are

essentially equivalent between factors and among variables within a factor, and (b) the estimated factor loading standard errors are relatively small".

However, past research has shown that using these rule-of-thumb values ignores numerous factors such as sample size, estimation method, and the total amount of variance explained by the individual factor loadings. These can affect the loading stability and accuracy, and demonstrate that these assumptions are often violated. (Cliff and Hamburger, 1967; Cudeck and O'Dell, 1994). Table 4.21 presents rotated component matrixes with the varimax rotation method and maximum likelihood extraction method. The pattern matrix (Table 4.22) shows the following percentages of the total variance:

- 23.59% due to social influence
- 18.6% due to the feature value
- 6.96% due to the effort expectancy
- 4.91% due to performance expectancy
- 5.32% due to the relationship expectancy; and
- 2.087% due to the facilitating construct

Table 4.23 presents rotated component matrixes with varimax rotation method and maximum likelihood extraction method. The pattern matrix (table 4.24) shows the following percentages of the total variance:

- 42.228% due to the contributive use
- 11.580% due to professional benefits
- 3.457% due to consumptive use

Table 4. 21 Rotated component matrixes: pattern matrix. Source: analysis of survey data (SPSS file)

Rotated Factor Matrix						
	Factor					
	1	2	3	4	5	6
PE1				.540		
PE2				.724		
PE3				.786		
EE1			.821			
EE2			.730			
EE3			.664			
SI1	.751					
SI2	.871					
SI3	.931					
RE1					.557	
RE2					.621	
RE3		.			.727	
FC2						.566
FC3						.718
FC4						.516
FV1		.590				
FV2		.635				
FV3		.642				
FV4		.431				
Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.[a]						

Table 4. 22 Total variance explained. Source: analysis of survey data (SPSS file)

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.880	36.212	36.212	4.484	23.598	23.598	2.686	14.135	14.135
2	2.073	10.912	47.124	3.542	18.643	42.240	2.069	10.889	25.024
3	1.645	8.658	55.782	1.324	6.967	49.208	1.991	10.481	35.505
4	1.443	7.594	63.376	.933	4.913	54.121	1.958	10.304	45.809
5	.999	5.259	68.635	1.011	5.322	59.442	1.539	8.099	53.908
6	.810	4.264	72.898	.396	2.087	61.529	1.448	7.621	61.529
7	.735	3.869	76.767						
8	.645	3.393	80.160						
9	.600	3.158	83.318						
10	.517	2.723	86.041						
11	.456	2.398	88.439						
12	.402	2.117	90.556						
13	.371	1.955	92.511						
14	.352	1.855	94.366						
15	.315	1.659	96.025						
16	.261	1.372	97.397						
17	.252	1.327	98.724						
18	.208	1.096	99.820						
19	.034	.180	100.000						
Extraction Method: Maximum Likelihood.									

Table 4. 23 Rotated component matrixes: pattern matrix. Source: analysis of survey data (SPSS file)

Rotated Factor Matrix			
	Factor		
	1	2	3
CSU1			.588
CSU2			.588
CSU3			.406
CTU1	.856		
CTU2	.694		
CTU3	.624		
PB1		.713	
PB2		.416	
PB3		.882	
Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.			

Table 4. 24 Total variance explained. Source: analysis of survey data (SPSS file)

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.227	46.971	46.971	3.801	42.228	42.228	2.229	24.764	24.764
2	1.333	14.811	61.782	1.042	11.580	53.808	1.637	18.193	42.957
3	.859	9.542	71.325	.311	3.457	57.265	1.288	14.308	57.265
4	.635	7.052	78.377						
5	.570	6.336	84.712						
6	.429	4.765	89.477						
7	.381	4.231	93.708						
8	.308	3.424	97.133						
9	.258	2.867	100.000						
Extraction Method: Maximum Likelihood.									

4.4.4 Analysis and Results of Structural Equation Modelling (SEM)

This section aims to answer the fourth and fifth research questions. This research applied SEM to test the proposed hypotheses between the latent constructs within the Extended UTAUT. Byrne (2010) proposes using two phases to test a proposed model using SEM. This study tested the measurement model in the first stage, which clarifies the relationships between the observed items and the latent (unobserved) constructs. Moreover, this phase demonstrated the CFA results. This research tested the structural (i.e., regression path) model in the second phase, clarifying the causal relationships among the observed constructs. The analyses and results of the measurement and structural model are clarified in the following sections.

4.4.4.1 Measurement Model

The measurement model consists of 23 indicators. Table 4.25 presents the results of the measurement model, including standardised factor loadings (λ), standard errors (SE), critical ratio (CR), squared multiple correlations, average variance extracted (AVE), composite and Cronbach's alpha reliabilities for each construct. The table reveals the following:

- In the factor loadings most of the construct indicators are significant. In other words, confirmatory factor analysis for most of the constructs is significant and sufficient for doing the structural equation modelling. The standardised factor loadings (λ) almost all have a value greater than 0.70, indicating a strong association between the factors and their parental construct. However, some indicators (e.g., facilitating conditions item two, three and four; feature value item three and four; professional benefit two, and consumptive use one) shows a loading of below 0.70; these values show a moderate strength. Even though some scholars (Hair et al., 2010; Henseler, Ringle and Sinkovics, 2009; Tabachnick and Fidell, 2013) recommend factor loadings in the range of 0.5 to

0.7 is acceptable, item reliability is attained if factor loading values are ≥ 0.4, as long as the sample size ≥ 200 (Hair et al., 2010). Therefore, this research kept them for further analysis since Churchill (1979) recommends that factor loadings values above 0.5 are acceptable.

- The critical ratios (or t-values) are above 1.96 for all of the factor loadings, indicating that the factor loadings are statistically significant (Byrne, 2010).
- The AVE refers to "the amount of variance that is captured by the construct concerning the amount of variance due to measurement error" (Fornell and Larcker, 1981, p. 8). Compared to composite reliability, AVE embodies a more robust indicator of the factor reliability (Fornell and Larcker, 1981). With the exception of facilitating conditions (0.377), the results suggest that the average variance extracted value of all the proposed model factors exceed the threshold value of 0.50. However the researcher kept the facilitating conditions value as it was still above the level that Fornell and Larcker (1981) suggest. This was because the average variance extracted may be a more conservative (traditional) estimate of the validity of the measurement model, and "on the basis of *pn* (composite reliability) alone, the researcher may conclude that the convergent validity of the construct is adequate, even though more than 50% of the variance is due to error" (Fornell and Larcker, 1981).
- Composite reliabilities for the factors vary from 0.725 to 0.963, exceeding the threshold value of 0.70 that Hair et al. (2010) advise. However, the composite reliability for facilitating conditions was 0.640, lower than what they advise. Moreover, the facilitating conditions' Cronbach's alpha reliability is 0.719 (above the 0.70 advised by Field (2005). Therefore, it presents acceptable levels of reliability.
- The correlation between different items supports an internal consistency, which this correlation shows if several variables presumed to measure the same construct produce

similar scores. Internal consistency can differ from zero to one for computing Cronbach's alpha (Ursachi, Horodnic and Zait, 2015). Cronbach's alpha reliabilities for all factors exceed the threshold value of 0.70 suggested by Field (2005), except for feature value, which is slightly lower than what Field (2005) recommends (0.679). Ursachi, Horodnic and Zait (2015, p. 681) said that "[a] general accepted rule is that Į of 0.6–0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good level". On the other hand, the composite reliability for the feature value construct exceeds 0.7, as advised by Field (2005). Thus, it represents the acceptable reliability level. Some other scholars such as Iacobucci and Duhachek (2003) advise scientists to calculate standard errors and decide on Cronbach's alpha with a confidence interval to enhance Cronbach's statistical power. In addition, Peterson (1994) contributed hugely to consumer behaviour research by studying the quality of alpha from hundreds of articles in these areas and explained a predictable level of 0.77.

Table 4. 25 The measurement of goodness of fit, including all criteria for the extended UTAUT model

Reliability Cronbach's Alpha = 0.852				**Composite Reliability = 0.881**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Performance Expectancy Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.665
PE3	<---	PE	0.85	1.000				0.731	
PE2	<---	PE	0.84	0.995	0.064	15.45	***	0.715	
PE1	<---	PE	0.74	0.825	0.063	13.11	***	0.551	
Reliability Cronbach's Alpha = 0.816				**Composite Reliability = 0.865**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Effort Expectancy Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.604
EE3	<---	EE	0.75	1.000				0.568	
EE2	<---	EE	0.75	0.940	0.085	11.018	***	0.575	
EE1	<---	EE	0.81	0.974	0.085	11.503	***	0.668	
Reliability Cronbach's Alpha = 0.916				**Composite Reliability = 0.909**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Social Influence Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.850
SI3	<---	SI	0.93	1.000				0.864	
SI1	<---	SI	0.91	1.094	0.06	18.156	***	0.836	
Reliability Cronbach's Alpha = 0.719				**Composite Reliability = 0.698**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Facilitating Conditions Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.436
FC3	<---	FC	0.69	1.000				0.482	
FC2	<---	FC	0.67	0.845	0.103	8.173	***	0.461	
FC4	<---	FC	0.60	0.732	0.097	7.575	***	0.365	
Reliability Cronbach's Alpha = 0.679				**Composite Reliability = 0.745**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Feature Value Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.493
FV4	<---	FV	0.64	1.000				0.420	
FV3	<---	FV	0.64	0.914	0.118	7.73	***	0.419	
FV2	<---	FV	0.80	1.08	0.133	8.12	***	0.642	
Reliability Cronbach's Alpha = 0.791				**Composite Reliability = 0.808**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Relationship Expectancy Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.659
RE3	<---	RE	0.75	1.000				0.727	
RE2	<---	RE	0.76	0.905	0.076	11.94	***	0.589	
Reliability Cronbach's Alpha = 0.716				**Composite Reliability = 0.679**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Consumptive Use Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.565
CSU2	<---	CSU	0.79	1.000				0.636	
CSU1	<---	CSU	0.70	0.802	0.07	11.47	***	0.493	
Reliability Cronbach's Alpha = 0.811				**Composite Reliability = 0.824**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Contributive Use Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.640
CTU3	<---	CTU	0.74	1.000				.556	
CTU2	<---	CTU	0.78	1.079	0.088	12.20	***	.612	
CTU1	<---	CTU	0.86	1.246	0.093	13.44	***	.753	
Reliability Cronbach's Alpha = 0.750				**Composite Reliability = 0.745**				**Squared Multiple Correlations**	**Average Variance Extracted**
η1 Professional Benefits Standard Factor Loading (λ)				Estimate	SE	CR	P	Value	0.663
PB3	<---	PB	0.81	1.000				0.656	
PB1	<---	PB	0.81	1.04	0.102	10.15	***	0.670	

4.4.4.2 Reliability and Validity of Constructs

a) Convergent Validity

This research assessed convergent validity based on the estimated coefficients of each measurement scale (including composite reliability, average variance extracted and Cronbach's alpha). Table 4.26 indicates that the composite reliability for all constructs is above 0.70, except for the consumptive use construct. The average variance extracted is equal to or above 0.5, except for the facilitating condition construct. Cronbach's alpha is above 0.7 for all constructs. Therefore, almost all constructs are good indicators of convergent validity (Fornell and Larcker, 1981).

Table 4. 26 Reliability and convergent validity for all constructs

Construct	AVE	CR	Cronbach's alpha
PE	0.665	0.881	0.852
EE	0.604	0.865	0.816
SI	0.85	0.909	0.916
FC	0.436	0.698	0.719
FV	0.493	0.745	0.679
RE	0.659	0.808	0.791
PB	0.663	0.745	0.75
CSU	0.565	0.679	0.716
CTU	0.64	0.824	0.811

b) Discriminant Validity

This research conducted discriminant validity to ascertain whether each construct and its indicators are different from any other construct and its indicators in the proposed model. The table below shows the discriminant validity of all constructs used in the proposed model. Moreover, the square root of average variance extracted (SRAVE) for each construct is shown by the diagonal line. The square root of average variance extracted for each construct is higher

than any correlation value below it, revealing an adequate degree of discriminant validity (Fornell and Larcker, 1981). Table 4.27 presents the discriminant validity for all constructs.

Table 4. 27 Discriminant validity for all constructs

	FC	EE	SI	RE	FV	CSU	CTU	PB	PE
FC	**0.66**								
EE	0.372	**0.777**							
SI	0.591	0.41	**0.922**						
RE	0.385	0.387	0.346	**0.812**					
FV	0.476	0.314	0.361	0.705	**0.702**				
CSU	0.451	0.479	0.528	0.832	0.714	**0.752**			
CTU	0.37	0.483	0.531	0.637	0.644	0.874	**0.8**		
PB	0.444	0.043	0.223	0.365	0.598	0.466	0.388	**0.814**	
PE	0.461	0.456	0.61	0.511	0.589	0.685	0.718	0.32	**0.816**

4.4.4.3 Test of the Structural Model

SEM analysis is the preferred statistical tool for studying relationships among constructs. The model, depicted in Figure 4.7, was tested using structural equation modelling with AMOS Graphics and SPSS Version 25.0 software. Prior to the proposed model's path analysis, it is essential to confirm the structural model's satisfactory model fit indices. Structural model fit indicators estimation uncovered satisfactory results, with a $\chi 2$ value of 275.804 and 193 degrees of freedom. The remaining fit indices, including AGFI= 0.879 GFI= 0.915, CFI= 0.971, RMSEA= 0.041, RMR= 0.046 and PNFI = 0.695, are well within their expected threshold values. It is appropriate to conduct path analysis after establishing adequate structural model fit indices.

Table 4.28 shows the results of testing the hypotheses. Performance expectancy significantly impacts consumptive ESN use ($p < 0.05$ and β=.179), confirming H1a. The results also confirm H1b about the positive impact of performance expectancy on contributive ESN use ($p < 0.01$

and β=.357). Effort expectancy (EE) does not play a significant role in the prediction of consumptive use ($p > 0.05$ and β=.086), rejecting H2a. However, effort expectancy positively impacts contributive ESN use, and the results show that the regression weight for effort expectancy in the prediction of contributive use is significant ($P < 0.05$ and β=.137), confirming H2b. The global tests of model fit are the first essential for a local test to have a meaning or validity. The researcher found that effort expectancy ought to impact professional benefits during the model fit. Effort expectancy impacts negatively on professional benefits ($P < 0.01$ and β=-0.405). Greater social influence would result in greater contributive use of the ESN; the coefficient obtained is significant, supporting H3a ($p < 0.01$ and β=0.179). Furthermore, the previous study by Chin et al. (2020) strongly supports the notion that social influence is more associated with contributive use than consumptive use, and they mention that social influence has a relatively slight impact on consumptive use. However, social influence does not significantly impact the consumptive ESN use among academic staff ($p > 0.05$ and β=.105). The facilitating condition has been found to have a non-significant impact on consumptive and contributive ESN use, thus not confirming H4a and H4b ($p > 0.05$ and β=.056; $p > 0.05$ and β=-.150). Facilitating conditions emerged as a negative predictor of contributive ESN use in higher education. The features of ESNs (e.g., subscribing, tagging, followers and high-profile users) empower academic staff to share and consume knowledge on ESN platforms considerably ($p < 0.05$ and β=.259; $p < 0.05$ and β=.240). These results confirm H5a and H5b, respectively. Relationship expectancy has also been found to exert a direct influence on consumptive and contributive ESN use ($p < 0.01$ and β=.467; $p < 0.05$ and β=.228), thus confirming H6a and H6b. Finally, the more academic staff use ESNs for obtaining information and knowledge from the platform, the greater the benefits the knowledge seekers will receive. Thus, the result is significant and confirms H7 ($p < 0.01$ and β=0.709).

*Table 4. 28 Hypotheses testing, *** p < 0.00*

Hypotheses	Independent Construct		Dependent Construct	Path Coefficient	P-values	Hypothesis Support
H1a	PE	--->	CSU	0.179	.039	Supported
H1b	PE	--->	CTU	.357	***	Supported
H2a	EE	--->	CSU	. 086	.211	Not Supported
H2b	EE	--->	CTU	.142	.031	Supported
H3a	SI	--->	CSU	.105	.190	Not supported
H3b	SI	--->	CTU	.179	.027	Supported
H4a	FC	--->	CSU	.056	.512	Not supported
H4b	FC	--->	CTU	-.150	.084	Not supported
H5a	FV	--->	CSU	.259	.017	Supported
H5b	FV	--->	CTU	.240	.025	Supported
H6a	RE	--->	CSU	.467	***	Supported
H6b	RE	--->	CTU	.228	.015	Supported
H7	CSU	--->	PB	.709	***	Supported
H8	EE	--->	PB	-.405	***	Supported

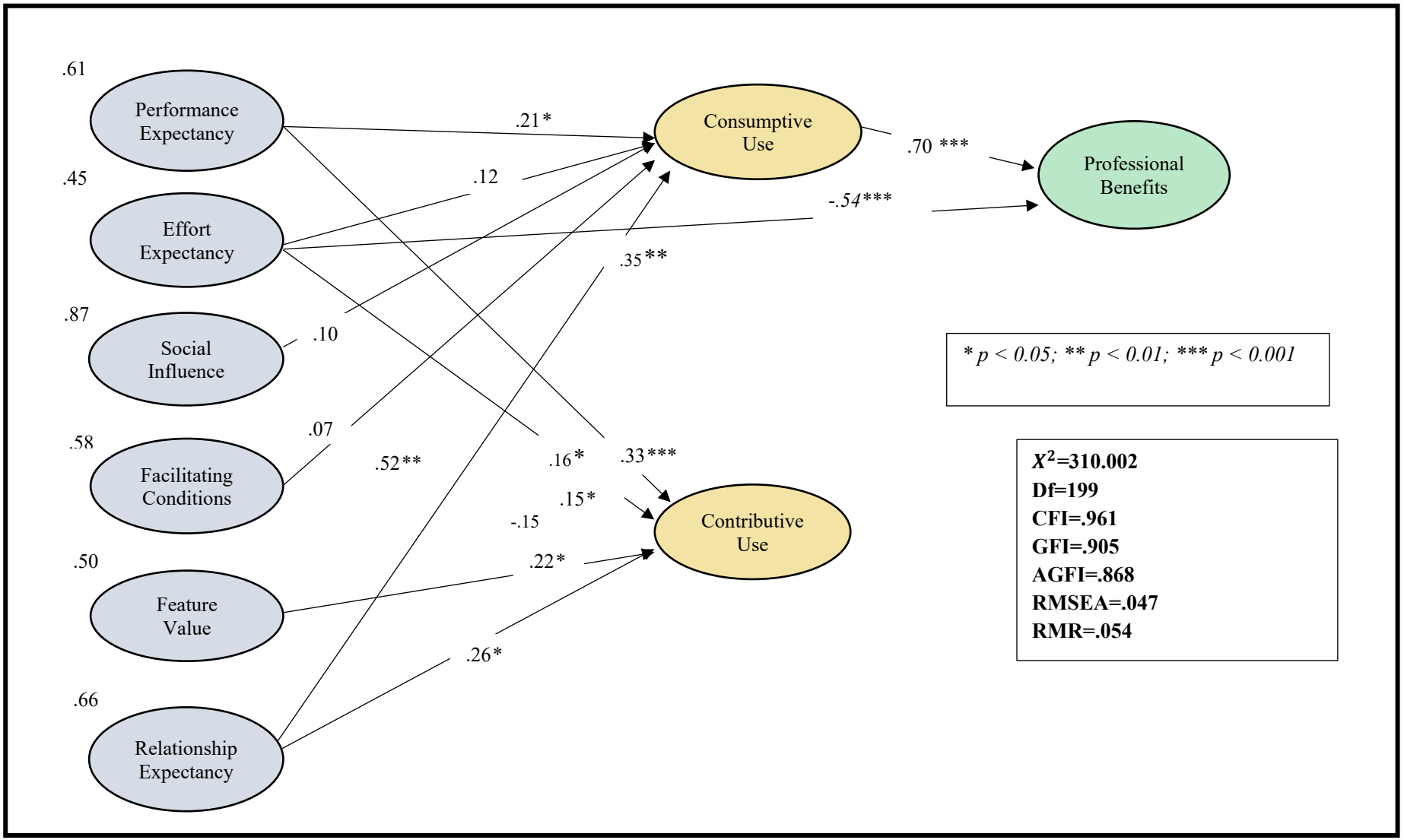

Figure 4. 7 The results of the structural model and the standardised path coefficient

4.4.5 Individual Differences in Gaining Benefits Through Consuming Information via an Enterprise Social Network

To determine who is likely to use an ESN platform to gain benefits (e.g., receiving research grants, attending workshops and applying for an academic position), this research tested potential differences in gender, age and experience. The independent t-test is a parametric statistical test that was used to compare the means of two groups (e.g., male and female). In addition, a one-way ANOVA was used to compare means of more than two groups (i.e., age groups, years of experience).

4.4.5.1 Procedure for Calculating Percentage of Professional Benefits for Each Individual

Before estimating the user differences in getting benefits, this research calculated the benefits for everyone (254 cases). The following figure shows how this research calculated the benefits gained by individuals. There were three statements designed for professional benefits, each of which was measured using a five-point Linkert scale, with scores ranging from 3 to 15. The gap between the lowest value and the higher value is 12. To get the percentage for everyone, the researcher totalled the scores given for benefits and divided them by 12. Figure 4.8 illustrates the procedure for calculating the percentage of benefits for an individual. Appendix K presents the calculations for professional percentages for each participant.

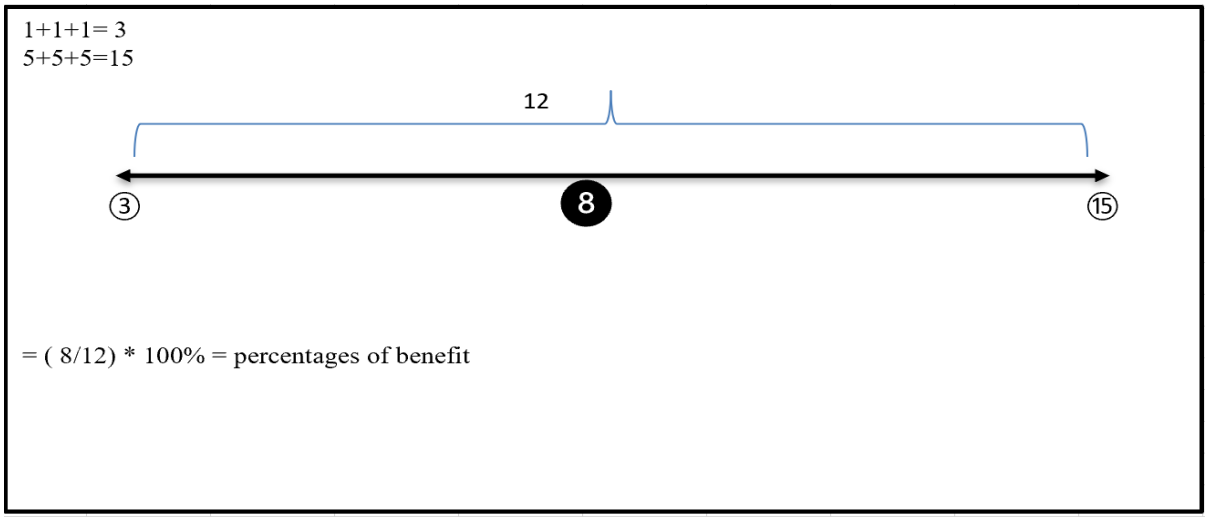

Figure 4. 8 Procedure for calculating the percentage of benefits for everyone

4.4.5.2 Gender

An independent t-test was conducted to determine whether gender differences exist in gaining benefits (e.g., receiving research grants, attending workshops and academic events, and applying for academic positions) through consuming information via ESNs. Table 4.29 provides a summary of statistics based on comparing two groups (i.e., males and females).

Section 1.3.5.10 of the Engineering statistics handbook describes the Levene test as a test for k samples to check for equal variances. "Equal variances across samples is called homogeneity of variance. Some statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The Levene test can be used to verify that assumption." (National Institute of Standards and Technology, 2012).

Table 4.30 shows the results from Levene's test. The p-value is more significant than 0.05, therefore, this means variances are not significantly different. The t-test results reveal that the difference between males and females in gaining benefits is insignificant ($t = 1.126$, $p > 0.05$). In other words, males and females are not significantly different.

Table 4. 29 Group statistics for gender (individuals gaining benefits)

Group Statistics					
	Gender	N	Mean	Std Deviation	Std Error Mean
PB-PER CENT	Male	155	41.1330	24.57988	1.97430
	Female	99	37.7113	22.02969	2.21407

Table 4. 30 T-test for gender (individuals gaining benefits). Source: analysis of survey data (SPSS)

Independent Samples Test										
		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PB-PER CENT	Equal variances assumed	3.781	.053	1.126	252	.261	3.42169	3.03899	-2.56337	9.40674
	Equal variances not assumed			1.153	225.201	.250	3.42169	2.96647	-2.42391	9.26728

4.4.5.3 Age

Analysis of variance (ANOVA) are "techniques for comparing means of normal populations generally assume the populations have the same variance" (National Institute of Standards and Technology, 2012, Section 7.4.2). A one-way ANOVA was performed to analyse how different age groups impact on receiving research grants, attending workshops and academic events, and getting fellowship positions. ANOVA and descriptive results (Tables 4.31 and 4.32, respectively) reveal insignificant effects of different age groups on benefits received ($F= 1.143$, $p > 0.05$). In other words, there are no significant differences in receiving benefits across different age groups. Figure 4.9 illustrates the means plot for age groups based on gaining benefits.

Table 4. 31 ANOVA analysis for age group

ANOVA					
PB-PER CENT					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1275.740	2	637.870	1.143	.320
Within Groups	140033.945	251	557.904		
Total	141309.685	253			

Table 4. 32 Descriptive statistics: comparing mean for different age groups

Descriptive								
PB-PER CENT								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20- 34	146	39.0983	24.51920	2.02922	35.0877	43.1090	.00	100.00
35-49	93	42.0329	21.77702	2.25817	37.5479	46.5178	.00	100.00
50 or over	15	32.7753	25.67833	6.63012	18.5551	46.9955	.00	83.33
Total	254	39.7994	23.63337	1.48289	36.8790	42.7198	.00	100.00

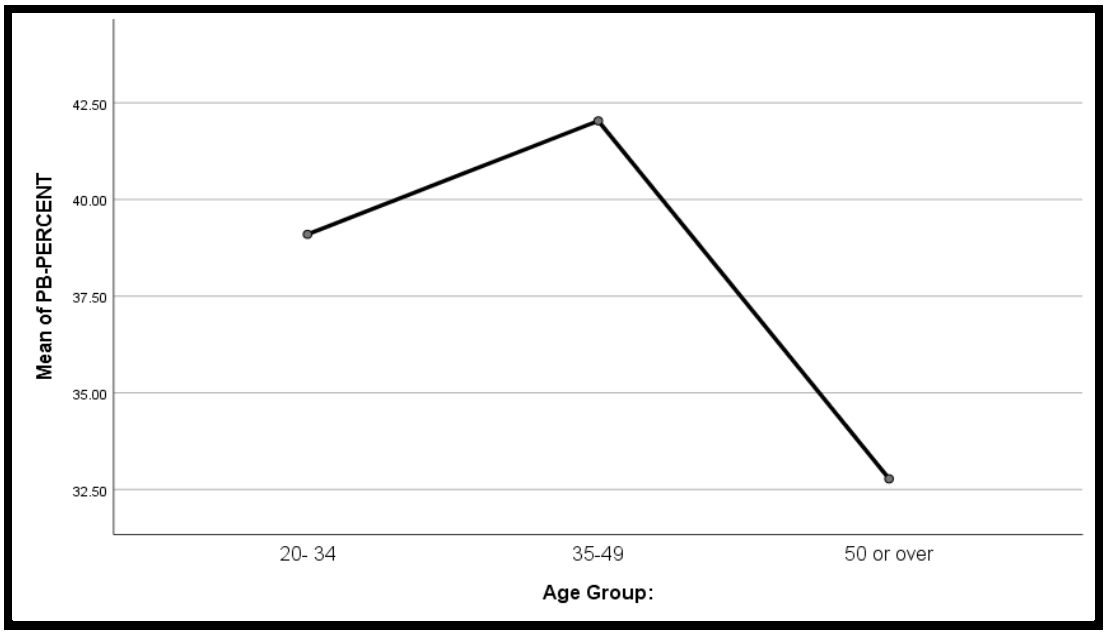

Figure 4. 9 Means plot: age groups depending on benefit

4.4.5.4 Experience in Using Enterprise Social Network

A one-way ANOVA was performed to examine how the years of experience in using ESNs impact gaining benefits (e.g., receiving research grants, attending workshops and academic events, and getting fellowship positions). ANOVA and descriptive results (Tables 4.33 and 4.34, respectively) reveal a significant impact of years of experience on benefits received *(*F= 5.013, $p > 0.05$). In other words, the more years of experience individuals have, the more benefits they will obtain (e.g., updating on academic events, workshops, updating on upcoming research projects and applying for research fellowships). Figure 4.10 illustrates the means plot for years of experience based on gaining benefits.

Table 4. 33 Descriptive statistics: comparing mean for years of experience (source: analysis of survey data, SPSS)

Descriptive								
Professional benefits percent								
	N	Mean	Std Deviation	Std Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than 1 year	151	35.9843	23.16545	1.88518	32.2594	39.7093	.00	100.00
More than 1 year but less than 3 years	62	41.6701	23.81400	3.02438	35.6224	47.7177	.00	100.00
More than 3 years but less than 5 years	24	48.2601	22.65245	4.62391	38.6948	57.8254	8.33	91.66
5 years or more	17	54.9188	19.99925	4.85053	44.6362	65.2015	16.66	83.33
Total	254	39.7994	23.63337	1.48289	36.8790	42.7198	.00	100.00

Table 4. 34 ANOVA analysis for experience (source: analysis of survey data, SPSS)

ANOVA					
Professional benefits percent					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8018.873	3	2672.958	5.013	.002
Within Groups	133290.812	250	533.163		
Total	141309.685	253			

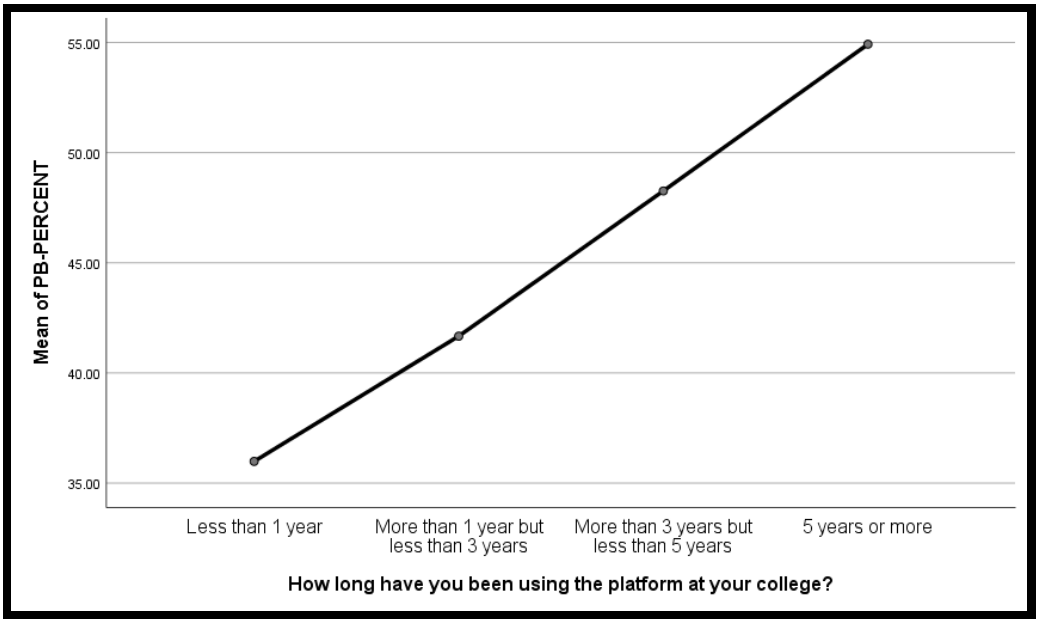

Figure 4. 10 Mean plot: years of experience using ESN depending on benefit

4.4.6 Testing for Multi-Group Invariance

This thesis applied invariance analyses to determine the effect of gender, age, and academic position on the extended UTAUT framework constructs. Figure 4.11 explains the steps employed in the variance analyses. This research was initiated by conducting a separate configural invariance test for gender, age and academic position. The initial step in testing for invariance requires only that the number of factors and factor-loading pattern be the same across groups (i.e., no equality constraints are enforced on any parameters) (Byrne, 2010). In

methodological literature, the first model is commonly termed the "configure model" (Byrne, 2010, p. 239). The multi-group model serves two essential functions. First, it permits invariance tests to be conducted across the two groups at the same time (i.e., estimating parameters for both groups simultaneously). Then, in analysing for invariance, the fit of this configural model offers the baseline value versus all consequently specified invariance models are compared. After that, the interest in performing a measurement and structural invariance test is focused more specifically on exchange for which parameters in the measurement and structural components of the model are equivalent across the two groups where the process is accomplished by assigning equality constraints on parameters. The measurement invariance analysis (measurement weight) for gender, age and academic positions separately determines if different groups would use the same pattern in measuring the observed items (Byrne, 2010). If the result is invariant, the data for each specific group are appropriate for structural invariance analysis. However, if the two groups have understood the items differently (non-invariance), this thesis identifies the source of the non-invariance and the observed item(s) that caused the non-invariance. After that, if the measurement model's result is invariant, then this thesis goes to the next step. However, if the results are still non-invariant, this study stops the analysis.

In the second part of the analysis, the invariance structural model analysis has been conducted to determine if gender, age and academic position are variant or invariant to understand the relationships between the unobserved constructs. In conducting a structural invariance test, this thesis follows two steps. Firstly, if group members (i.e., male and female groups) understand the relationships between the constructs similarly (invariant), then the data for each group are suitable for latent mean invariance analysis. However, if group members understand the relationship between the constructs differently (non-invariance), this research determines the

source of non-invariance. This thesis reports $\Delta\chi 2$ and Δdf and fit indices (CFI and RMSEA) models for comparison purposes in all previous steps.

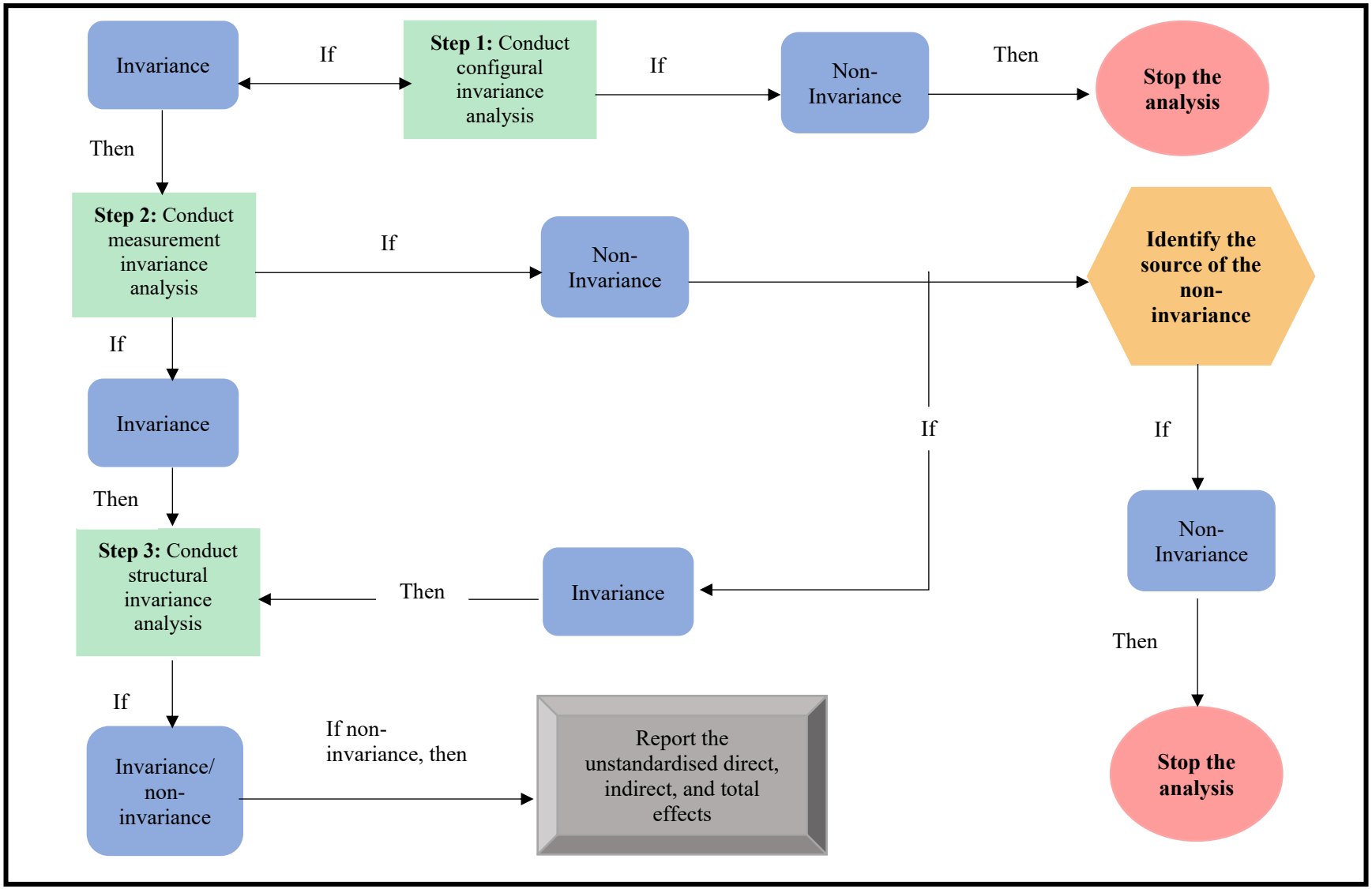

Figure 4. 11 Invariance analysis steps: developed for this research from Byrne (2010)

4.4.6.1 Gender

The first invariance analyses classified the participants into two groups according to the participants' gender (i.e., males or females). Table 4.35 presents the gender invariance results. Results related to this first multi-group model testing for configural invariance reveal the value to be 597.855 with 398 degrees of freedom. The CFI and RMSEA values, as expected, are 0.933 and 0.045, respectively. From this information, this thesis can conclude that the hypothesised multi-group model fits quite well across males and females.

Table 4. 35 Results of configural invariance analysis for gender

Gender (n=254)	P		df	CFI	RMSEA
Measurement model	0.000	597.855	398	0.933	0.045

Table 4.36 presents the measurement model for gender. The measurement model results reveal significant differences between males and females in understanding the questions of each latent construct. In other words, males and females understood the questions differently. This research determines the source of non-invariance.

Table 4. 36 Results of factorial invariance analysis for gender (assuming unconstrained model is correct)

Gender (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	0.032	597.855	398	25.259	14	0.933	0.045

This research determined the source of non-invariance. This study found that facilitating condition item two was a source of non-invariance and therefore deleted the item. After running the measurement model invariance test, the results show insignificant differences for gender (table 4.37). Consequently, the data for each group move to the second stage for a structural testing model.

Table 4. 37 Results of factorial invariance analysis for gender (assuming unconstrained model is correct)

Gender (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	0.292	535.347	356	15.246	13	0.937	0.045

The structural model results revealed insignificant differences between the male and female groups in determining the relationships between the proposed constructs. In other words, both males and females perceived the importance of the relationships between the constructs similarly (table 4.38).

Table 4. 38 Results of structural invariance analysis for gender (assuming model measurement weight is correct)

Gender (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	.446	535.347	356	27.327	27	.937	.045

4.4.6.2 Age

The second invariance analyses classified the participants into two groups according to the participants' age (i.e., 20–34 and 35 above). Table 4.39 explains the age invariance results. Results related to this first multi-group model testing for configural invariance reveal the value to be 597.801 with 398 degrees of freedom. The CFI and RMSEA values, as expected, are 0.932 and 0.045, respectively. From this information, this thesis can conclude that the hypothesised multi-group model fits quite well across age groups.

Table 4. 39 Results of configural invariance analysis for age

Age group (n=254)	P		df	CFI	RMSEA
Measurement model	.000	597.801	398	.932	.045

The measurement model results revealed insignificant differences between the 20 to 34 years age group and the 35 years and above group in understanding the latent construct questions. Therefore, both age groups understood the questions similarly. Table 4.40 shows the results of factorial invariance analysis for age.

Table 4. 40 Results of factorial invariance analysis for age (assuming unconstrained model is correct)

Age group (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	0.766	597.801	398	9.942	14	0.932	0.045

Second, the structural model results revealed significant (non-invariance) differences between the 20 to 34 years age group and the 35 years and above group in determining the relationships between the proposed constructs. The source of the non-invariance can be attributed to the relationship of the effect of

- effort expectancy on consumptive use
- relationship expectancy on consumptive use
- effort expectancy on contributive use
- performance expectancy on contributive use
- consumptive used on professional benefits, and
- effort expectancy on professional benefits

In other words, the two age groups understood the importance of consumptive use and contributive use differently. Therefore, age moderates the influence of extended UTAUT on consumptive and contributive enterprise social network use and the effect of consumptive use on professional benefits. Table 4.41 shows the structural invariance analysis for age group.

Table 4. 41 Results of structural invariance analysis for age (assuming model measurement weight is correct)

Age group (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	0.016	597.801	398	46.28	28	0.932	0.045

4.4.6.3 Academic Position

The final invariance analyses classified participants into two groups according to the participants' academic position, including doctoral researchers and others (e.g., postdocs, lecturers, readers, Research administrators, professors, and administrators). Table 4.42 explains the academic position invariance results. Results related to this first multi-group model testing for configural invariance reveal the value to be 608.058 with 398 degrees of freedom. The CFI and RMSEA values, as expected, are 0.928 and 0.046, respectively. From this information, this thesis can conclude that the hypothesised multi-group model fits moderately well across academic positions.

Table 4. 42 Results of configural invariance analysis for academic position

Academic position (n=254)	P		df	CFI	RMSEA
Measurement model	.000	608.058	398	.928	.046

The measurement model results revealed invariance (insignificance) differences between doctoral researchers and other academic position groups in understanding the question of each latent construct. Table 4.43 shows the factorial invariance analysis for an academic position.

Table 4. 43 Results of factorial invariance analysis for an academic position (assuming unconstrained model is correct)

Academic position (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	.704	608.058	398	19.771	14	.928	.046

Table 4.44 shows the structural model results and reveals invariance differences between doctoral researchers and other academic position groups in determining the relationships among the proposed constructs.

Table 4. 44 Results of structural invariance analysis for academic position (assuming model measurement weight is correct)

Academic position (n=254)	P		df	Δ	Δdf	CFI	RMSEA
Measurement model	.498	608.058	398	27.379	28	.928	.046

4.5 Summary

This chapter reported the data analysis of this study. First, a genre analysis method was used to identify specific genre conventions on a series of electronic posts generated on Microsoft Yammer over two years in university one and university two. Second, a grounded theory approach was used to determine the factors influencing ESN use among academic staff. A grounded theory approach identified four main themes: motivators, barriers, outcomes, and strategies. Third, this research carried out the preliminary analysis including exploratory factor analysis. Fourth, using AMOS, this research evaluated the measurement model and structural model of the proposed extended UTAUT model between the two groups of consumptive and contributive academic staff use. After that, a series of one-way ANOVA and a t-test were employed to determine the effects of gender, age and experience of using an ESN on the benefits received by individuals (e.g., receiving research grants, attending academic workshops, attending showcasing events and applying for academic positions). Finally, this research conducted invariance analyses to determine how different groups (e.g., regarding gender, age, and academic position) perceived the model's items, paths and means. Overall, the proposed hypotheses were confirmed using SEM (measurement and structural analysis). A discussion, conclusions and implications will be presented in the next chapters.

Chapter Five: Discussion

Chapter Five: Discussion

5.1 Introduction

This chapter seeks to discuss the analysis in detail and fulfill the objectives of this research by addressing the study questions (shown below) and evaluating the relationships in the proposed conceptual framework.

RQ.1 How do academic staff use ESNs in higher education?

RQ.2 What are the motivators for, and barriers to, using ESNs among academic staff in higher education?

RQ.3 How and to what extent does the modified UTAUT factors influence ESN consumptive and contributive use?

RQ.4 To what extent do knowledge seekers gain benefits (e.g., research grants, attending events and showcasing, applying for an academic position) from using ESNs?

Finally, the chapter presents the theoretical, practical, and methodological contributions of this research to the scientific literature.

5.2 Evaluation on the Qualitative Findings

The qualitative study was conducted to improve the conceptual framework of this research and to increase its validity as well as to identify factors (i.e., generative mechanisms) influencing online knowledge sharing - with the aim of developing appropriate measures of constructs for HEIs. Therefore, an analysis on Microsoft Yammer posts, and a focus group have been conducted in order to gain a deeper insight into the motivators for and barriers to using ESNs among academic staff in higher education in order to develop the quantitative instrument.

RQ.1 How do academic staff use ESNs in higher education?

From the genre analysis of Yammer posts in university one, Yammer was used as (a) an information-sharing channel, (b) a space for sharing upcoming academic events or gatherings (e.g., showcasing for professional careers, workshops), (c) a place for receiving open calls, fellowships and collaborating with other research staff, and (d) a collaborative platform to share information and discuss funding opportunities for current research and innovation programmes.

Universities collaborate with a variety of external partners on innovative and entrepreneurial projects such as joint research, contract research, consultant research, services and logistics (Guerrero, Cunningham and Urbano, 2015). As a result, the university uses Yammer to promote future research funding sources and assist academic employees in writing bids (e.g., research calls, workshops, brokerage events). The administration staff used Yammer as a new noticeboard channel to assist academic staff with funding opportunities and applications. Knowledge seekers (academic staff) continually checked Yammer for upcoming research opportunities while remaining anonymous and without contributing to the site. This consumptive only behaviour is due to the highly competitive nature of academics in seeking funding sources for their research and their desire not to compete for funding with academic colleagues. In summary, the research indicated that Microsoft Yammer is a potentially helpful first stage of the research collaboration process (i.e., a notice board facility) rather than a full-blown collaboration tool.

From genre analysis of web posts in university two, Yammer is employed to provide a variety of services to assist staff with their enquiries, and to share and update general departmental information. In contrast to university one, university two rarely used Yammer to promote funding opportunities. Instead, they discussed more generic issues which did not require anonymity such as learning how to control and maintain their information assets at universities,

learning new features of digital apps (e.g., Microsoft Yammer, Microsoft Teams and webinar apps), discussing and increasing their awareness about driving safety, raising issues and inquiries about lab facilities, and receiving guidance about their work. Therefore, there was more evidence of both contributive and consumptive use of the Yammer platform by academic staff.

Furthermore, university two used Yammer for non-work activities such as handicraft and sports courses, networking, advertising or promoting leisure events and local events within and outside of the university. These recreational activities help staff escape from work quickly and build friendships with others with similar interests across the departments. Such activities are essential to the platform's long-term viability because these recreational groups involve staff who may not then have had the motivation to use the platform.

Microsoft Yammer takes on the following roles: building a common ground, providing input and harnessing existing knowledge. Zhao and Rosson (2009) defined common ground as a shared awareness of a topic among individuals. Most of the communication on the platform serves these purposes: individuals get to know each other, discover what is going on inside the institution, and how people talk about and explain exciting topics or concerns through conversations (opinions, content), casual talk and exchanging information. Posting contents, files and data that users believe will be entertaining and important to their peers is observed as new information input.

Therefore, the results showed that Yammer is a valuable tool for asking questions and being answered by experts, but also for learning about other users' knowledge (e.g., experience) in university two. The findings indicate that there is a greater amount of contributive and consumptive use of Yammer in university two when compared with university one.

RQ.2 What are the motivators for, and barriers to, using ESNs among academic staff in higher education?

From the focus group at university one, the discussion was transcribed, and then, grounded theory was performed. The constructs and items were developed according to the insight that was gained from the grounded theory process and the scientific literature. During the data analysis of the focus group discussion, four major categories were defined, motivators, barriers, outcome and strategies. These four categories are comprised of 14 influencing elements based on the focus group results:

5.2.1 Motivators

The critical motivators for using ESNs among academic staff were feature value, information value, institutional demand, and appropriate organisational and technical support. The feature value and information value are congruent with the conclusions of predecessors' studies (Cleveland, 2016; Elkaseh, Wong and Fung, 2016; Fosso Wamba et al., 2019; Matikiti, Mpinganjira and Roberts-Lombard, 2018; Dumpit and Fernandez, 2017; Sarwar et al., 2019). The institutional demand is consistent with the findings of Waizenegger et al. (2020) and Gilstrap, Schall and Gilstrap (2019). The value and sustainability of a social network are undoubtedly dependent on the quality of content generated by communication activities (Aladwani, 2017) and the creation of an informal environment on the network (e.g., informal communication) (Chin, Evans and Choo, 2015). Participants remarked throughout the conversation that we educated individuals to create useful content for the platform (e.g., making bold titles, keeping it short, adding links to the posts, sharing interesting and work-related topics).

In addition, ESN capabilities (such as viewed by hashtags and see insight groups) help people trace audiences, search and filter for certain subjects, and observe groups behind the scenes. According to the findings, academic staff communicate upcoming research events and work programmes on a daily basis, thanks to a tagging function that allows knowledge seekers to access needed material more quickly. The informal setting of an ESN might increase academic staff involvement. According to one of the participants, Microsoft Yammer will become an internal communication channel in the future. Yammer will become more of a collaboration tool among employees and less of a work-related tool between departments. This incident may be discovered on the platform at this point. One participant, on the other hand, emphasised that Microsoft Teams will become the institutional necessity. In the future, academic staff might cooperate with their departments and the entire university on projects, webinars, and file storage and sharing. This research confirms that the use of Yammer is currently optional, but the rising awareness of Yammer as an internal departmental tool in higher education will increase its use.

5.2.2 Barriers

The main obstacles to adopting ESNs were resistance to engagement on the online platform, emotional anxiety, loss of knowledge, a lack of organisational pressure, poor content quality and a lack of time. The findings, such as emotional anxiety, are consistent with the study of Zhang *et al.*, (2020). The research indicate that emotional anxiety has a detrimental impact on ESNs (Bright, Kleiser and Grau, 2015). As a result, people are increasingly lowering and even discontinuing their usage of social media. Social media fatigue is a manifestation of consumers' negative emotions when engaging in social network activity (Swar and Hameed, 2017; Luqman *et al.*, 2017). Emotional anxiety is defined as being worried and anxious about utilising the platform, because academic staff have no prior experience with employing ESNs in the

workplace (inadequate knowledge). People, on the other hand, are afraid to voice their thoughts, disagree with someone's posts and disrupt the workplace.

According to prior studies (e.g., genre analysis), academic staff resist exchanging knowledge on intra-organisational platforms for fear of losing valuable information; they want to remain anonymous. They would rather contact the person directly (e.g., telephone conversation, email or F2F). As a result, this study discovered that knowledge seekers are less willing to disclose information on ESNs that might jeopardise their competitive advantage.

According to Chatenier et al. (2009) and Nonaka, Toyama and Konno (2002) knowledge is a critical asset and a key source of innovation, and conserving knowledge is even more critical. Knowledge sharing is influence by two factors: sharing privately and sharing openly (Haeussler et al., 2014). According to Haeussler et al. (2014), academic scholars share information about their work privately in response to a specific request. The advantages of a private response include the exchange of knowledge for mutual benefit, but this is potentially offset by the perceived degree of rivalry between the academics (Haeussler et al, 2014). Consumptive users, as a result, contact administrative employees regarding award competitions and prepare applications through private channels (e.g., phone call, email or walk-in).

Another barrier to the engagement of users on the platform is a lack of organisational pressure. This finding is congruent with those of Koch, Leidner and Gonzalez (2013) and Chin, Evans and Choo (2015). Several participants highlighted the absence of organisational assistance during the session. There was no official training offered after Yammer was launched at the institution. During the early stages of platform development, the research administrative staff described a lack of help from marketing communication. The administrative staff conducted a series of minor training sessions via internal event notification. One of administration staff

complained about the platform's poor facilitating conditions and the staff would expect a bit more from marketing communication department to advertise in the university.

Although deploying new technology is difficult, such obstacles to using social media tools have been consistently observed in previous research (Maican et al. 2019). The organisational and technological infrastructure facilitates the utilization of technology (Venkatesh et al., 2003). According to Venkatesh et al. (2003), if the institution does not give resources (such as technical assistance, education, training, or social benefits) to support the technology, the individual's desire to utilise the technology will be negatively impacted.

5.2.3 Outcomes

The critical use of ESNs in a user's professional life was one of the most important topics raised during the focus group discussion. In terms of how ESNs might serve academic staff in higher education, the findings indicate that the platform can help users communicate timely information, debate current research and innovation programme possibilities, make connections, and develop "dialogue" among academic staff. Because of the presence of these limitations (e.g., emotional anxiety, a lack of institutional pressure, low content quality and resisting engagement on the platform), these benefits are minimal. According to Zhang et al. (2020, p. 99), “users reduce their social participation by only browsing and checking relevant messages without making responses or reluctantly express their personal opinions or views in public due to their higher level of concern about their values and privacy”. This kind of behaviour may be due to a fear of compromising valuable information (e.g., research possibilities). In addition, the lack of training in how to use Yammer is also a barrier to engagement with the platform. As a result of this reluctance to contribute to the platform, the user's intention will progressively degrade, as will their passion and interest in utilising social

media. Active individuals that post regularly will discontinue utilising the site on a regular basis.

5.2.4 Strategies

This category reflects the academic staff opinion of the Yammer organisational and technological infrastructure. This category includes the steps that must be taken to improve the interaction between consumptive and contributive users on the platform. As previously stated, before in this research, university one did not give adequate support for the platform's introduction, and just one group began to market it through internal university event notices. The participants suggested that the institution undertake ongoing official awareness programmes.

Upper management is a crucial influence in the use and measurement of new technologies at the university (Tsai and Beverton, 2007). Tsai and Beverton (2007) define top-down management as the top's power to build mutual commitment and clarify logic and strategies for transformation. Top-down management is frequently regarded as the most effective method of promoting critical and complex systems comprised of various individuals and components (Tsai and Beverton, 2007). The importance of top-down management in education is mostly due to upper management's considerable role for university operations (Vandenberghe, 1999; Sayed, 2002).

Several participants said throughout the discussion that staff development is critical to instructive change. Overall, the university failed to adopt and execute an ESN (e.g., Yammer) among academic employees due to the poor facilitating condition. As a result, facilitating factors for ESNs, such as a designed organisational, social networking platform purpose (Aral, Dellarocas and Godes, 2013), training and awareness events, praising and reverse mentoring, are identified as drivers for motivating academic staff to utilise the platform and gain

information. This finding is challenged by Gruzd, Staves and Wilk (2012), who discovered that supportive conditions had a beneficial influence on researcher decisions to use social media technologies. Most researchers regard social media as a communication tool for promoting work that has been published or presented at conferences (Gruzd, Staves and Wilk, 2012). The contradictory conclusion in Gruzd, Staves and Wilk (2012) demonstrates that in order to obtain popularity, researchers' market or promote their works (publications, conferences, technical reports) on PSNSs. However, organisational, and technological support for employees should be available for practical usage.

5.3 Evaluation on the Quantitative Results: Factors Influencing ESNs use for Knowledge Sharing

This research examines factors influencing the use of ESNs on knowledge sharing and research opportunities among academic staff. This section discusses the research hypotheses based on the existing literature.

Following sections will discuss the answers for research question 3 and 4.

RQ.3 How and to what extent did the modified UTAUT factors influence ESN consumptive and contributive use?

RQ.4 To what extent did knowledge seekers gain benefits (e.g., research grants, attending events and showcasing, applying for an academic position) from using ESNs?

5.3.1 Performance Expectancy and Relationship Expectancy

According to the findings, performance expectancy and relationship expectancy are the strongest determinants of ESN use (consumptive use and contributive use). Other research that uses the original UTAUT model (Puriwat and Tripopsakul, 2021; Chandran and Alammari, 2021; Etemadi *et al.*, 2020; Donelan, 2016; Nassuora, 2013; Wang et al., 2014; Mosunmola et

al., 2018) has shown similar results (i.e., higher education, commercial context). According to Kalra and Baral, (2020), performance expectancy is critical for workplace social networking adoption for knowledge sharing. Performance expectancy improve the user's performance, rewards, identification and admiration (Van der Heijden, 2004). Contradicting our findings, Birch and Irvine (2009), Attuquayefio and Addo (2014), Mandal and McQueen (2012) found performance expectancy to be statistically insignificant with behavioural intention in small business use. Chin et al. (2020) and Wang et al. (2014) demonstrated that if a user has a more significant performance expectancy, they are more inclined to consume rather than contribute to workplace social networks. Chin et al.'s findings also contradict the findings from this research. This thesis shows that performance expectancy has a more significant influence on contributive ESN use than consumptive ESN use. This may be described as follows: the more a user feels that other users understand and validate his/her self-view, the less anxious and the more positive the relationship dialogue is (Thomas-Hunt, Ogden and Neale, 2003). As a result, the leading individual is encouraged to continue the collaboration and contribute information. According to Venkatesh et al. (2003) and Etemadi et al. (2020), users ignore anticipated challenges associated with technology adoption and want to utilise it if they find the technology beneficial for their work-related advantages. Baker and Delpechitre (2013) defines performance expectancy as how an academic staff feel the platform will help them execute their work better. According to Venkatesh et al. (2003), the expected outcome is divided into job-focused expectations and individual objectives. Gruzd, Staves and Wilk (2012) discovered that performance expectancy is connected with intention to use, and usage of, social media among academics in their exploratory study examining the influence of social media knowledge sharing among academic staff. However, due to the highly competitive academic research atmosphere, performance expectancy may be the critical reason why academic staff use any information technology. According to the findings in this research, 36% of academic

staff utilised Yammer in their work and employed Yammer to communicate and get information about planned research activities (i.e., events, workshops, funding opportunities). Consequently, community groups will intensify competition for getting grants from community resource systems.

Furthermore, Gruzd, Staves and Wilk (2012), Rapp et al. (2013) and Alotaibi, Crowder and Wills (2017) describe two major advantages of consumptive use when utilizing social media applications: building new relationships and reinforcing current ties among academic employees. This thesis contradicts prior research by Chin et al. (2020) in terms of the relationship expectancy. According to the findings of this study, relationship expectation influences both consumptive and contributive ESN use. According to Chin et al. (2020), relationship expectancy is more connected with contributive use as a result of developing a favourable reputation. However, the findings from this research revealed that consumptive usage is a more successful way of engaging in relationships than contributive use. Regardless, consumptive use is typically more passive and is not directly observed by other corporate members (Nguyen and Malik, 2020). Because academic staff compete with one another to obtain the necessary information (e.g., grant chances), they must establish a relationship and connection with people who contribute to the platform. As a result, knowledge seekers think that adopting ESNs will give benefits by allowing community organisations to prioritise their research efforts and resource allocations, allowing them to compete effectively for funds.

5.3.2 Effort Expectancy

The results suggest that effort expectancy seemed to have a substantial influence on contributive use but not on consumptive use. This discovery is interesting, as it has not been demonstrated in the literature before. This finding illustrates that consumptive use and contributive use are separate corporate social network uses that are influenced by a variety of

factors. However, Chandran and Alammari (2021), Etemadi et al. (2020), Nassuora (2013), Thomas-Hunt, Ogden and Neale (2003), Wang, Wu and Wang (2009) and Mosunmola et al. (2018) found a significant positive effort expectancy impact on the intention to use social media platforms. Chin et al. (2020) discovered that effort expectancy had no significant influence on the utilisation of beneficial ESNs. They argued that consumptive use necessitated additional expertise-required tasks such as finding, filtering, and digesting the material uploaded on the workplace social network. As a result, they discovered that reduced effort expectation led to greater consumption than productive ESN use. The contradictory finding in this study and those by Baptista and Oliveira (2015) and Trier and Richter (2013) might be attributed to the motivation to utilise the platform in higher education, which still necessitates significant learning and the ongoing adjustment of expected effort.

The conclusion might also be attributed to the recent introduction of these platforms (i.e., Microsoft Teams and Slack) throughout the institutions, which could have served as a cause, limiting the user's exposure and understanding of its potential (Kalra and Baral, 2020). When compared to other types of users, academics may have a rather strong feeling of knowledge and adaptability when it comes to new tools (Wang, Wu and Wang, 2009). Although the majority of our participants have been utilising ESNs for less than three years at a university, academic employees have long used public social networking platforms (e.g., Facebook, Twitter and LinkedIn). As a result, they may conclude that effort expectancy is not a significant factor influencing intention and ESN consumption.

5.3.3 Social Influence

The findings reveal that social influence has no significant impact on consumptive use; however, it is a significant factor on contributive ESN use. This finding is consistent with Wang et al. (2014), Kim and Lee (2006) who observed social influence may be less significant for

voluntary behaviours. Kelman (1958, p. 53) said that pioneering users have an impact on technology adoption by others through three procedures: "compliance, internalisation and identification". Kelman defines “compliance” as that behaviour observed when a pioneering user requires a particular behaviour (e.g., use of a communication platform) and they then reward or penalise said behaviour accordingly. The insignificant result for compliance in this research’s findings is not surprising because participation on ESNs is voluntary, and consumptive users can remain anonymous. Thus, most users may not feel the need to conform to other people’s expectations (Grant and Preston, 2019).

Bagozzi and Dholakia's (2012) study supports this study’s findings, in terms of “identification” and “internalisation” as prominent social influences of the virtual community on user participation. Kelman (1958) goes on to show that users develop “adoptive behaviour” due the perceived expectation of a specific reward or approval. Users develop satisfaction derived from their compliance behaviour because they become socially acceptable. The study by Grant (2016), exploring the early adoption of social media tools across the supply chain in the UK home insurance market, reveals that the upstream supply chain will tender for repair work with the insurer who can decide which supplier to utilise for renovations. A buyer or supplier plays a contributive role in the market and opposing vendors should compete against each other to show off their buyer's ability to win bids. Consequently, the studies of Grant (2016) and Bagozzi and Dholakia (2012) are consistent and support the belief that “identification” and “internalisation” are leading social influences of the simulated community.

In contrast in this study, academic staff who consume or acquire knowledge or information from the platform are more inactive and needs-based. In addition, the participation on ESNs is voluntary, and consumptive users can remain anonymous. thus, social influence has a minus effect. Early in this study a one-way exchange of knowledge was observed and only 36% of

users were providing knowledge to the platform. Because the competition between academic staff is high when opportunities (e.g., funding work programmes) arise, they avoid contributing on the platform for fear of losing this valuable knowledge and/or letting others know they are after said opportunities.

5.3.4 Facilitating Conditions

The findings show that facilitating conditions are an insignificant predictor for both consumptive use and contributive use and have a reverse impact on contributive use. This finding contradicts the findings of Workman, 2014, Morosan and DeFranco, 2016, Bullinger, Renken and Moeslein (2011), Lallmahomed et al. (2013), Aral, Dellarocas and Godes (2013) and Beck, Pahlke and Seebach, (2014) and is consistent with the findings of Mandal and McQueen (2012) who found insignificant impact for small corporate holders. Bullinger, Renken and Moeslein (2011), Lallmahomed et al. (2013), Aral, Dellarocas and Godes (2013) and Beck, Pahlke and Seebach, (2014) found that facilitating conditions (e.g., educating, guidelines, training and awareness events) were identified as predictors for motivating workers to use the platform to acquire and collect knowledge.

Nevertheless, the focus group revealed several events and awareness programmes conducted by administration staff to enhance collaboration on Yammer. Because participating in this training was voluntary, academic staff believe that investing in this kind of platform is useless and ineffective. Another explanation is that this finding might be attributed to the element of competency among scholars in getting research grants, which refers to the mentality of consumptive users where they refuse to exchange knowledge and avoid conversing (and thus have their comments recorded) on an open platform like Yammer.

5.3.5 Feature Value

The new conceptualised relationships among feature value, consumptive use and contributive use are significant. This finding is congruent with Hacker et al. (2020), Favale et al. (2020) and Slaughter and Kirsch (2006), who discovered that higher credibility leads to better knowledge sharing between knowledge contributors and knowledge seekers. The earlier findings in this research (i.e., genre analysis) indicate that consumptive users could obtain needed information by quickly following up with experts (contributors). In addition, this research observed that administration staff reshared the posts several times in order to keep the posts at the top of the page. This ensured that the relevant and valuable posts remained visible to the academic staff. Therefore, reposting reduced response time to consumer demands, and decrease the time needed for new employee preparation, improving overall customer service (Kankanhalli, Lee and Lim, 2011).

In agreement with previous studies (Hacker et al., 2020; Panahi, Watson and Partridge, 2016 a, 2016 b; Beck, Pahlke and Seebach, 2014) who showed that tagging posts increases users' chances of discovering and retrieving new knowledge, this research observed that the use of tagging and “seen by” improved the ability of contributors to organise and find relevant posts and trace their engagement. Therefore, the features of ESNs enable academic staff to carry out activities associated with individual interests.

Several tools, such as Slack, Microsoft Teams and Zoom, provide the same or even more features that enable videoconferencing and instant messaging with co-workers. These features set them apart from earlier workplace social networks like Microsoft Yammer. Knowledge seekers and knowledge contributors can make use of virtual events, online meetings, and shared channels (Favale et al., 2020). Therefore, academic staff were able to attend events virtually, that they would otherwise not have been able to attend in person.

5.3.6 Professional Benefits

The significance of the newly understood links between professional advantages and consumptive use cannot be overstated. The findings from platform's usage show increases in usage as more users are kept up to date on the newest academic work programme options, participate in academic workshops, and apply for, and receive, research funding. This is consistent with the findings of Gruzd, Staves and Wilk (2012), Ortbach and Recker (2014) and Ramayah, Yeap and Ignatius (2013), similarly found that usage increases as academic staff utilise social media to update and promote scholarly work. Additionally, they observed that these advantages relate indirectly to scholars' work performance.

Communication benefits refer to technical capabilities for online collaboration, which helps users share information in a timely manner and build a person perception simultaneously (Rad et al., 2019). Previous research (Bullinger, Renken and Moeslein, 2011; Schöndienst and Dang-Xuan, 2011; Brown, Dennis and Venkatesh, 2010; and Rad et al., 2019), shows communication benefits have a considerable influence on performance expectancy. Other factors, such as the idea of self-image expression, might contribute to the professional benefits of utilising social media. This is an area that will require further investigation in the future.

5.3.7 Discussion on Individual Differences in Gaining Benefits Through Consuming Information via an Enterprise Social Network

Collected data in this research were examined by applying inferential statistics. T-tests and ANOVA were used to assess the relationship between knowledge seekers' characteristics and the benefits of using ESNs. This research found that gender and age are insignificant in determining individuals' benefits. These findings are consistent with Kang, Johnson and Wu (2014), Khechine et al. (2014), Beck and Halloin (2017), Marsh, Ketter and Rasgon (2009),

Ceci et al. (2014) and Volker and Steenbeek (2015), and inconsistent with Orji (2010), van den Besselaar and Sandström (2016), Van Der Lee, Ellemers and Fiske (2015), Höylä et al. (2016) and Rørstad and Aksnes (2015). Höylä et al. (2016) explained that young researchers spent more time researching and writing grant proposals. In contrast, professors spend almost 30% of their time on reviewing or administrating grants and advising students and are paid to consult.

It was believed that young scholars needed more help with writing proposals and research contracts, and research support staff could help more junior researchers with these basics. Similarly, Freeman et al. (2001) said that young researchers are in competition against one another for desirable professional opportunities that are increasingly limited. Contrary to the expected outcome from this study, it was found that age was not a significant factor in gaining benefits from ESN use.

This insignificant result is associated with the difficulty in getting research funds for mid-or lower-ranked universities since Brexit (Highman, 2019). Highman (2019) warned that the percentage of research revenue in mid- or low-ranked universities received from the EU is a worry post-Brexit. High-ranked universities receive a net benefit in terms of EU funding, due to their varied research and branding. However lower ranked universities are far more reliant on EU funding to support their research programmes. Moreover, the European Commission has made it apparent that higher education institutions will not get funds from the exit date until the end of Horizon 2020 (Highman, 2019). Fortunately, this fear was not realised. In January 2021 the UK government "confirmed that previously successful Horizon Europe applicants will receive funding from the UKRI regardless of the outcome of the UK's efforts to associate with Horizon Europe" (UKRI, 2023).

This study found more benefits for those academic staff in the 35 to 49 years age group. This is due to the different academic positions that exist for that age range along with career advancement opportunities. This result is consistent with Bloch, Graversen and Pedersen's (2014) Van den Besselaar and Sandström (2016) findings that showing acceptance of a research grant has a positive impact on both the likelihood of achieving a full professorship and career advancement in general.

Finally, this thesis found that the years of experience of using ESNs significantly affect individuals' benefits. In other words, the more comfortable a user is with using an ESN platform the more benefits they will realise from its use. This is aligned with Munzel, Galan and Meyer-Waarden (2018) and Leftheriotis and Giannakos (2014).

5.3.8 Discussion on Invariance Investigation across User Characteristics

Invariance analysis offers a greater understanding of the conceptual model of this study and the invariance validity of its components. Furthermore, the invariance test emphasises the significance of the expanded UTAUT model's applicability in higher education. Following a series of invariance investigations, it was possible to determine that the conceptual framework was invariant across academic positions in terms of measurement model and structural model. This finding implies that various academic positions perceive model structures and variables in a comparable way. However, the other two invariance tests (gender and age) did not. These findings support the validity of the model in the information systems domain, which is influenced by gender and age group and is consistent with other studies (Krasnova et al., 2017; Khechine et al., 2014).

5.3.8.1 Gender

Following a series of invariance analyses, this thesis may conclude that the research model is non-invariant across gender in terms of measurement model and structural model. Gender appears to be a moderator for the extended UTAUT model, based on this finding. The measurement model's non-invariance finding between male and female groups was considerably different from the two types of workplace social network use (consumptive use and contributive use). This disparity shows that both groups (males and females) understood the constructs and their connection differently. This shows that UTAUT factors impact on female groups' usage of ESNs more than male groups. Previous research has demonstrated that gender is a major attribute of IT users and also a significant element on an individual user level (Baptista and Oliveira, 2015; Venkatesh, Thong and Xu, 2016; Trauth, 2011).

In terms of the relationship between performance expectancy and gender, females engage on ESNs more than males to perform tasks quickly and increase job performance. This finding might be explained by the fact that females prioritised achievement needs (Venkatesh et al., 2003; Garber, Hyatt and Boya, 2017). The findings contrast with the findings of Martins et al. (2014), who found no substantial moderating impact by either gender. For gender groups, the effect of effort expectancy on both consumptive and contributive usage was negligible (male and female). Nevertheless, the research by Venkatesh et al. (2003) and Venkatesh and Davis (2000) reveal that males were less concerned about using the system than females. The results, on the other hand, reveal that social influence is a substantial driver among females. This conclusion might be explained by the fact that men are less sensitive to other people comments than females. The finding, though, contradicts Suki and Suki's (2017) results on social influence.

Furthermore, this study found that facilitating conditions are a key influencer among females, which is similar to the findings of Venkatesh et al. (2003), Venkatesh and Davis (2000) and Suki and Suki (2017). In terms of relationship expectancy, females are more likely to employ an ESN to make friends. Females, according to Baumeister and Sommer (1997), identify themselves in terms of their connectivity to others, develop a more visible desire for relationships and trust people with whom they have a relational bond (Maddux and Brewer, 2005). The findings might be explained by the uses and gratification theory that females are more likely to use social networks to retain connections with current co-workers, thereby showing their loyalty (Krasnova et al., 2017). Females are strongly influenced by feature value. The findings indicate that females are more likely than males to use social network features like reposting, tagging, high-profile users and subscribing.

5.3.8.2 Academic Position and Age

The measurement, structural and latent mean models reveal consistency across academic positions in the invariance studies. The structural weight level's insignificance suggests that academic positions are not a moderator for the extended UTAUT model.

The invariance analysis across ages shows that the measurement model is consistent. The structural model results, on the other hand, show non-invariance (significant) differences between the 20–34 years age group and the 35+ age group. Therefore, age is a substantial moderator of the influence of performance expectancy, effort expectancy, relationship expectancy and feature value on both consumptive use and contributive use. Performance expectancy is a significant predictor of older people's performance (35 years and above). The latter finding is consistent with Warsame, and Ireri's (2018) finding and concurs with Venkatesh et al. (2003), who found that the moderation effect was stronger in younger people.

According to assessments, age has a moderating influence in the association between effort expectancy and academics' intention to use ESNs.

For younger people, the effect of effort expectancy was substantially more significant (20–34 years old). In contradiction to previous studies (Warsame and Ireri, 2018; and Khechine et al., 2014), but in agreement with Yu (2012) study, this study found a substantial moderating influence between effort expectancy and age on consumptive use and contributive use of ESNs for knowledge sharing.

According to the result in this research, age has no role in the association between social influence, facilitating conditions and academic usage of ESNs. This discovery is consistent with the findings of Al-Gahtani, Hubona and Wang (2007) and Warsame and Ireri (2018), who found that there was no moderation influence on the relationship between social influence and behavioural intention, and the relationship between facilitating condition and behavioural intention. However, studies by Warsame and Ireri (2018), Arenas-Gaitán, Peral-Peral and Ramón-Jerónimo (2015) and Martins, Oliveira and Popovič, (2014) discovered that age moderates the link between facilitating conditions and the intention to use technology.

In terms of relationship expectancy, older individuals (35+ years), as compared to younger people (20-34 years), utilise technology to establish and maintain connections with other academic staff inside the university. This might be explained by the fact that older individuals utilise communication to achieve their emotional goals in relationships (Carstensen, Gottman and Levenson, 1995). Furthermore, among younger employees, age has a moderating influence in the relationship between feature value and consumptive use (20–34 years old). This might be attributable to younger employees retrieving the necessary knowledge by using hashtags and subscribing.

5.4 Theoretical Implications and Contributions

This research adds to the information system literature and introduces a valid scale to measure factors that influence the use of ESNs within higher education. In addition, this research has extended UTAUT to include ESN usage from a theoretical perspective. Venkatesh et al. (2003) formulated UTAUT by reviewing and analysing eight information system models. They used data from four organisations in different industries (e.g., entertainment, telecommunication services, banking, and public administration) over six months with three points of measurement (a longitude study). The original UTAUT proposed by Venkatesh et al. (2003) explained 69% of the variance in intention to use new technology.

However, the new extended UTAUT model proposed in this research could reach a better acceptable fit and explain 84 and 66 per cent of the consumptive and contributive ESN variance, respectively, which is higher than the original UTAUT. The expanded UTAUT model in this research highlights predictors that impact consumptive and contributive behaviour using ESNs and the relative significance of these factors. The findings suggest that the underlying factors of the model impact contributive use more than consumptive use. For example, knowledge providers are involved in more straightforward tasks (e.g., posting/sharing information) and they require less assistance and organisational facilitation; thus, these factors were believed to lead to more consumptive use than contributive use. In contrast to Chin et al.'s (2020) and Wang et al.'s (2014) assumptions about the nature of contributive use, this research found that these factors lead to more contributive use than consumptive use and, consequently, make a new contribution to the higher education research context.

More specifically, the findings revealed that contributive use was significantly affected by performance expectancy, effort expectancy, social influence, feature value and relationship

expectancy. With the development of increasingly powerful ESN platforms and collaborative systems for exchanging information, new factors such as building new and maintaining friendships, features values and information values become increasingly significant. The research confirms the substantial impact of new constructs (with new scales to measure), relationship expectancy and feature value on consumptive and contributive ESN use.

The formulated UTAUT by Venkatesh et al. (2003) could not explain individual acceptance and usage decisions in organisations alone and had become outdated with the emergence of new communication technologies. As such, the original UTAUT model proposed by Venkatesh et al. (2003) is no longer valid for communication networks or devices used today. The features of ESN platforms (e.g., chatting, video calling, using presenter mode, changing background and shared channels) enable academic staff to carry out activities associated with individual and professional interests. Academic staff are now able to attend events virtually, and no longer have to rely on attending in person events. These features can boost academic staff's contributions to knowledge sharing and building friendships with other academic colleagues as the burden on budgets is reduced (e.g., travel, hotel expenses, training budgets) and they can attend more events per year increasing their knowledge sharing opportunities. In addition, virtual attendance supports a green agenda, potentially reducing the carbon food print of the institution.

A limitation of Venkatesh et al. (2003) study was that they did not measure the benefits to scholars from the usage of new technology and they concluded that further study was required. This research therefore expands on the original UTAUT model by creating a scale on which the benefits to academics can be measured. This thesis found that the more users consume the platform, the more benefits (e.g., receiving research grants, getting an academic position, taking part in workshops and events) they will get. This research also estimated the percentage

of benefits obtained by each individual and measured the individuals' benefits compared to user characteristics (e.g., gender, age group and experience). In further studies, other actual benefits identified (e.g., self-image expression) by scholars could fit into the model.

5.5 Managerial Implications

This research also provides valuable contributions to universities from a managerial viewpoint to improve practical interventions to address distinctive ESN usage patterns, lessen resistance, and increase real and operative use of the work social platform among academic staff. Most academics and university administrators would accept that the importance of getting research grants is on the rise (Polster, 2007). Therefore, these platforms turn scholars into competitors for research funding. Based on the results in this research, academic staff avoid exchanging knowledge on intra-organisational platforms for fear of losing valuable information; they prefer to talk with a person who wrote a post in a private channel (e.g., telephone conversation, email or face to face). This research found that knowledge seekers are less likely to share information on an ESN that could compromise their competitive advantage.

Hence, this is a new contribution on how academic staff behave toward knowledge sharing on ESNs. Variance analysis of the significance level of gender, age and years of experience using ESNs shows that age and gender are insignificant in determining individuals' benefits. This new finding contradicts with the original work by Venkatesh et al. (2003). They claimed that age, gender, and experience are moderators in determining intentions to use new technology in most situations. The insignificant differences in age and gender regarding gaining benefits via the use of ESNs suggest there have been difficulties in getting research funds for mid- or lower-ranked universities since Brexit as funding becomes a scarcer resource for mid- and low-ranking universities. This outcome may be a hint for mid- and low-ranking universities that they need to find an approach for getting more grants. University research staff could help their

scholars find a more comprehensive range of funding sources matching scholars' ideas to the requirements of various funders using these systems.

The findings suggest that the underlying factors of the model impact contributive use more than consumptive use. On the other hand, this research claims that managers should not rely on open systems such as Microsoft Yammer for academic staff to use for specific tasks such as getting research funds. Typically, the research indicates that Microsoft Yammer is a potentially helpful first stage of the research collaboration process (i.e., a notice board facility) rather than a full-blown collaboration tool.

To lessen resistance toward the use of ESNs, specifically Microsoft Yammer, among academic staff and entrust them to make use of it, universities need to execute diverse methods. During the focus group, participants constantly emphasised that the lack of organisational support (i.e., official staff development programme, training, and events) inhibited staff from effectively using Yammer in the university. Therefore, senior management plays a crucial role in developing a knowledge-sharing environment, by ensuring there is adequate support and training when rolling out any new technology. Their advocacy is key to ensuring buy-in from the academic staff.

In addition, this research found that social influence is helpful in the creation of ESN contributive use; universities can recruit leading people involved with and are passionate about social media use, such as university agents, to support the usage and boost workers' employment. Secondly, universities can organise promotional campaigns regularly to raise employee awareness and build the strength of ESN use. Thirdly, organisational IT systems need to provide training and education to facilitate staff use and report their issues in using ESNs. Therefore, this research found that the presence of IT leaders on ESNs is essential for a better adoption.

Furthermore, this study found the value of the content generated by contributors (e.g., work-related, accurate and up to date) to be a critical antecedent to sharing knowledge among academic staff. The value of the content (i.e., the quality and style) generated on the platform has been shown to have much more power in terms of facilitating knowledge sharing. Our results are aligned with those of Delone and Mclean (2002); however, their findings are rather old, which further strengthens the importance of the quality and style of content in regard to facilitating knowledge sharing. Academic staff may engage with other social media tools if the generated content is useful and valuable to their work, in addition to the other benefits they could achieve.

5.6 Methodological Implications and Contributions

Previous research has examined how social media can facilitate knowledge sharing between academics within higher education (Gruzd, Staves and Wilk, 2012; Nández and Borrego, 2013; Corcoran and Duane, 2017; Aldahdouh, Nokelainen and Korhonen, 2020; Chatterjee et al., 2020; Maican et al., 2019; Ortbach and Recker, 2014; Dermentzi et al., 2016; Veletsianos, 2012; Arshad and Akram, 2018; AlAwadhi and Al-Daihani et al., 2019). These scholars applied different methods (qualitative method and quantitative method) with different philosophical approaches (interpretivism and positivism) to discover factors influencing the use of social networks among academic staff within higher education. More specifically, the above studies used existing theories (e.g., Personality traits- TAM, UTAUT- DTPB and the Uses and Gratifications Theory) to measure factors influencing the use of social media between academics.

However, this research employed MM-GT with critical realism methodological principles. As mentioned in Chapter three, the advantages of using the critical realism methodology is that

new factors (e.g., feature value, information value and professional benefits) were identified and scales created, due to the qualitative nature of the critical realism.

By combining the qualitative and quantitative methods (e.g. Yammer posts, focus group and survey) the ability to hypothesise and determine the generative mechanisms that trigger the antecedents and outcomes of ESN usage is realised. Therefore, the triangulation of data sources (e.g., Web posts, focus group, survey) allows the researcher to obtain complementary viewpoints and a higher level of detail than could be acquired from either data source on its own. Methodological triangulation or methodological pluralism in this research were beneficial in a research strategy from a critical realism perspective for completeness and confirmation. Therefore, in mixed method study, quantitative and qualitative methods work in conjunction and feed into each other until a robust mechanism is produced that can explain the phenomenon observed.

The outcome of using critical realism in this mixed method approach is that a new theory was developed which used abstractions to hypothesise the impacts of ESN usage among academics in higher education. This theory was then expressed by means of empirical generalisation. In testing the hypotheses generated by this research, confirmation of the generative mechanisms was established and therefore the hypotheses can be considered validated.

Chapter Six: Conclusion

Chapter Six: Conclusion

6.1 Introduction

This thesis previously discussed on the analysing of the presented hypotheses in Chapter five and provided theoretical, managerial and methodological implications and contributions. This chapter seeks to provide the limitations of the study, implications for future research and closing marks.

6.2 Limitations

This study is not without its limitations, which need to be considered in generalising the results. Future research can overcome these limitations to add value to the knowledge-sharing literature. The limitations are as follows.

6.2.1 Data Collection

The first limitation is that using a self-reported survey to collect data is subject to sampling bias. There are numerous advantages to using a self-reported survey. It is, for instance, simple to measure and evaluate. However, the self-reported survey has a lot of shortcomings. For example, questionnaires with limited options may discourage responders from selecting an option. Furthermore, the self-reported survey is also fundamentally biased by respondents' current mood when they fill out the survey. Although various data gathering techniques were utilised, focus groups and web posts have been used to acquire a better understanding of academic staff's online information sharing in higher education. Due to time constraints and research resources, the data were collected in a precise period. As a consequence, the data can't be utilised to study behaviour over time. It often takes time to develop benefits from IT adoption and use (Newell, 2015). A longitudinal sample would be suitable for examining the

informal relationships among the study's factors and monitoring major changes in work effectiveness.

6.2.2 Online Community Member Types

In this study, the consumptive users and contributive users were differentiated based on the definitions of Chin et al. (2020), Cleveland (2016) and Marett and Joshi (2009), where contributive users are defined as those who posted at least a few times and consumptive users are defined as those who did not post during the same time span. According to Takahashi, Fujimoto and Yamasaki (2003), the consumptive users may be categorised as active and inactive consumptive users. Active consumptive users interact with posts from contributive users and spread knowledge in online forums, whereas inactive consumptive users consume the knowledge obtained for their individual objectives. To gain further understanding of desires in a workplace social network for knowledge sharing of various sorts of participants, the research of disparities in motivating forces of these two categories of consumptive users may be beneficial.

6.3 Implications for Future Research

Only a limited number of studies assessing two types of online group members, consumptive ESN users and contributive ESN users, for knowledge sharing in higher education within the UK, along with mixed findings, exist in the knowledge-sharing literature (Aldahdouh, Nokelainen and Korhonen, 2020; Corcoran and Duane, 2017; Arshad and Akram, 2018; Maican et al., 2019; Dermentzi et al., 2016; Ortbach and Recker, 2014; Gruzd, Staves and Wilk, 2012; Veletsianos, 2012; Nández and Borrego, 2013; Gu and Widén-Wulff, 2011), and there is a need for further examination within this area. Future studies might overcome the weaknesses of this study, as indicated by the following recommendations.

6.3.1 Study Replication

Future research that expands on the findings of this study and overcomes its limitations is advised. It is suggested that the study might be duplicated to explore the factors affecting academic staff use of ESNs since the use of ESNs such as Microsoft Teams, Slack and Zoom become an organisational need. The Coronavirus disease 2019 dilemma and its influence on both the commercial and academic world will likely have an impact on both the contributory and consumptive use of corporate social networks. The absence of an ESN would provide substantial obstacles in their regular work for university professionals who operate remotely at the time of the writing of the thesis, such as online teaching and online meetings with colleagues. Higher education has faced additional obstacles because of the present unexpected and unpredicted crisis. Universities are moving courses online, and online education is a difficult and complicated mission for education systems.

Similarly, the study might be replicated across industries to see if the findings are generalisable to a larger population. Furthermore, it would be worthwhile replicating this study in higher education in other locations to see whether the findings may be applied. However, the researcher anticipates that duplicating this study framework among academic staff might provide interesting results as ESNs now become institutional demand. Furthermore, using this conceptual research framework, additional research is welcome to identify other benefits (e.g., self-image expression) that may be gained by academic or non-academic staff via ESN use, as well as the differences in individuals' characteristics in gaining benefits.

6.4 Closing Remarks

Understanding what factors stimulate consumptive and contributive users to exchange information online in higher education is a field that has received little attention. This study

has shed some light on the motivations of participants in higher education's online knowledge-sharing process. There is a vital need for research into the motivating factors of consumptive and contributive users in higher education, both conceptually and empirically. Consumptive users and contributive users are rarely studied together to better understand the differences in driving factors in online information exchange. This study concluded that ESNs act as an information-sharing channel for posting details about upcoming academic events or reunions (e.g., showcasing for careers, workshops), a room for obtaining job listings and fellowships and partnering with other research staff, and for discussing funding opportunities of existing research and innovation initiatives. As more users are kept up to speed on the latest academic work programme possibilities, engage in academic workshops, and apply for and obtain research funding, the platform's utilisation will expand.

However, academic staff's actions demonstrate a hesitation to spread information on ESNs for fear of losing important knowledge or intellectual property. The actions showed that a workplace social network turns scholars into competitors for research grants, making it less likely that they will share knowledge that might compromise their competitive advantage. In addition, academic staff may find common ground, build relationships and maximise on existing expertise. Moreover, this study concludes that feature value, information value, institutional demand and adequate organisational and technological support in encouraging knowledge sharing on workplace social networks cannot be overstated. However, emotional anxiety, knowledge loss, a lack of organisational pressure, low content quality and a lack of time are the key barriers to academic staff adopting corporate social networks, leading to social media fatigue behaviour.

This study recommends that academic staff should strengthen their use by offering ongoing training, awareness campaigns, social benefits and senior management pressure. Performance

expectancy and relationship expectancy were shown to be important predictors of consumptive and contributive ESN use. Academic staff's performance improved as a result of performance expectancy, and as a result, academic staff are more likely to consume rather than contribute to workplace social networks. However, this study discovered that performance expectancy has a greater influence on social network contribution, which could be attributed to the fact that the more academic staff feel that other colleagues understand and validate their self-view, the more emotions of mental harmony the user raises in the relationship conversation. Aside from that, given the extremely competitive academic research environment, performance expectation may be the most important reason why academic staff employ any IT. As a result, community groups will face increased competition for funds from shared service systems.

Effort expectancy has a greater influence on contributive use than on consumptive use; this might be related to the fact that motivation to use the platform still demands considerable learning in higher education and the constant adjustment of expected efforts. Social influence has a greater influence on contributive ESN use than on consumptive ESN use, which is not unexpected given that membership of ESN platforms is voluntary, and consumptive users can remain anonymous. Academic staff who consume or gain knowledge or information from the platform are more passive inactive and need-based, therefore social influence has a negative impact.

Facilitating conditions are insignificant both for the contributive ESN and the consumptive ESN, which might be linked to the voluntary use by academic staff and the involvement in all training. Feature value has a major influence on both contributive and consumptive ESNs. This outcome might be attributed to improved trustworthiness, which results in greater knowledge sharing between knowledge suppliers and knowledge seekers. By promptly following up with experts, knowledge seekers might receive crucial information. Knowledge providers reshare

the content numerous times to make it relevant to the job of academic employees. Knowledge providers resharing postings reduced worker responsiveness to consumer needs, reduced the time required for new user preparation and enhanced overall customer service. Gender and age have little bearing on the advantages of utilising a corporate social network. This minor outcome relates to the difficulties in obtaining research funds for mid- and lower-ranked universities following Brexit.

This study's findings have a lot of practical consequences in providing insights into the dynamics of the driving forces of all users in general and two types of users, consumptive users, and contributive users, in particular, through online knowledge sharing in higher education. In terms of theoretical contributions, the UTAUT has been modified and extended by the addition of new constructs and the inclusion of two types of users in UK higher education. As a result, the study has provided a new perspective on information technology, making a substantial contribution to the development of a broader concept of technology acceptance and use.

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Appendix A: Letter of Approval

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
UB8 3PH
United Kingdom
www.brunel.ac.uk

24 February 2020

LETTER OF APPROVAL

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 26/02/2020 AND 31/05/2020

Applicant (s): MRS SHAKIBA KAZEMIAN

Project Title: The impact of enterprise social networks for changing communication culture into higher education

Reference: 22607-LR-Feb/2020- 24746-2

Dear MRS SHAKIBA, KAZEMIAN

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that
- research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor
-
- (Where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.

Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.

The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.

You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Hua Zhao
Chair of the Committee Name
Brunel University London

Appendix B: Letter of Approval

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
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28 January 2020

LETTER OF APPROVAL

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 28/01/2020 AND 28/02/2021

Applicant (s): MRS Shakiba Kazemian

Project Title: The impact of social networking platforms on changing communication culture in higher education

Reference: 18837-A-Jan/2020- 24359-1

Dear MS Shakiba Kazemian

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- Your invite should include that your study has been reviewed and approved by the College of Engineering, Design, and Physical Sciences.

The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.

Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.

The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.

You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Hua Zhao
Chair of the Committee Name
Brunel University London

Appendix C: Letter of Approval

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
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22 November 2019

LETTER OF APPROVAL

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN AND 23/11/2019 23/11/2019

Applicant (s): MRS Shakiba Kazemian

Project Title: The impact of social networking platforms on changing communication culture in higher education

Reference: 18837-A-Nov/2019- 21232-1

Dear MS Shakiba Kazemian

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that
- research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor
- (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant

Research Ethics Committee.

Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.

The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.

You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Hua Zhao

Chair of the College of Engineering, Design and Physical Sciences Research Ethics Committee Brunel University London

Appendix D: Letter of Approval

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
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5 November 2019

LETTER OF CONFIRMATION

Applicant: MRS Shakiba Kazemian

Project Title: Yammer posts

Reference: 18840-NER-Oct/2019- 20749-1

Dear Miss Shakiba Kazemian,

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has confirmed that on the basis of the information provided in your application, your project does not require ethical review.

Please note that:

- Approval to proceed with the study is granted providing that you do not carry out any research which concerns a human participant, their
- tissue and/or their data.
-

The Research Ethics Committee reserves the right to sample and review documentation relevant to the study.

If during the course of the study, you would like to carry out research activities that concern a human participant, their tissue and/or their data, you must inform the Committee by submitting an appropriate Research Ethics Application. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Good luck with your research!

Kind regards,

Professor Hua Zhao

Chair of the College of Engineering, Design and Physical Sciences Research Ethics Committee Brunel University London

Appendix E: Participant Invitation Letter for the Focus Group

Dear Participant,

I am writing to ask for your assistance as an enterprise social network user to participate in my research. My name is Shakiba Kazemian, a PhD student at the Department of Mechanical and Aerospace Engineering. I would like to invite you to participate in a focus group for my research. My research explores the impact of Enterprise Social Networking on knowledge sharing between academic staff in higher education. The purpose of the focus group is to help the study explore and identify the factors influencing the use of enterprise social network between staff within the university and assess the perceived *benefits* of knowledge sharing for academic staff.

Enterprise Social Network is web-based platforms that allow individuals to (1) communicate messages with their colleagues or circulate messages to everyone in the workplace; (2) clearly indicate or tacitly reveal specific collaborators as communication partners; (3) post, edit, and sort text and files linked to themselves or others; 4) view the messages, connections, writing, and data communicated, posted, edited, and sorted by anyone else in their organisation at any time. Microsoft Teams and Yammer are an example of enterprise social networking tools which the university employs.

Your response is critical to the success of this research. Please note that there are no "right" or "wrong" answers; please respond according to your current thoughts and feelings about using enterprise social networks (e.g., Yammer and Microsoft Teams) at Brunel University.

The information obtained during this focus group will remain confidential. None of the participants is identifiable. You are welcomed and encouraged to ask the consultant how your

personal information is protected. If you have any questions regarding the focus group, please contact me at the following email address.

Email: Shakiba.kazemian@brunel.ac.uk

The information obtained from this focus group provides valuable information that will lead us to understand what drives academic staff to continue using enterprise social networking platform at Brunel university and offers suggestions on how to increase academic staff's ongoing use of their organisation's microblogging platform.

Sincerely,

Appendix F: Questionnaire

Demographic Details questionnaire*:*

Please answer the following questions in the spaces provided, Circle, or tick the most appropriate options.

1. Age Group

   - 20-34
   - 35-49
   - 50 or over

2. Gender:

   □ Male □ Female

3. What is your professional position?

   - Professor
   - Associate Professor / Assistant Professor
   - Postdoctoral Research Assistantship/Fellowship
   - Doctoral researcher
   - Lecturer/ senior lecturer
   - Research and development staff
   - Others, please specify…

4. How often do you use Yammer at the university?

   - Frequently daily
   - Consistently daily
   - Weekly
   - Occasionally
   - Never

5. How often do you use Microsoft Teams at the university?

   - Frequently daily
   - Consistently daily
   - Weekly
   - Occasionally
   - Never

6. How long have you been using Yammer at the university?

   □ <1 Year □ 1-2 Years

   □ 2-5 Years □ >5 Years

7. How long have you been using Microsoft Teams at the university?

   □ <1 Year □ 1-2 Years

"Thank you for taking the time to complete this questionnaire."

Guiding Questions

Part One: User's Experience with Yammer

1. How has Yammer helped you today?
2. Have you tried to expand your relationship across the organization via Yammer? (e.g., getting to know colleagues and their competence, better, characteristics) (If Yes, share your experiences through conversation you had in informal communication with people on Yammer)
3. Has Yammer features helped you promote the core values, such as hashtag, Seen by and view insight groups (e.g., #Horizone2020, Seen BY., View insight the groups)?

Part Two: Issues with Using Yammer

A common question: "my organisation has Yammer, but no one is using it. Should I replace Yammer with some other social media tools?" The tool itself rarely is the cause of a low engagement rate.

1. What kind of Yammer adoption strategies has the university employed for staff? (e.g., internal marketing campaigns, training for staff, technical support)
2. What are the 3 common barriers to use Yammer at the university?

Appendix G: Participant Invitation Letter for the Survey

Topic: The Impact of Enterprise Social Networking on Knowledge Sharing between Academic Staff in Higher Education

Reference: 22607-LR-Feb/2020- 24746-2

Participant Information Sheet

Please read this information sheet before deciding whether or not to take part.

you are invited to take part in a study that investigating the impact of Enterprise Social Networking on delivering benefits among the academic staff within UK universities.

What is the purpose of the study?

The purpose of the study is to measure the uses drive affecting employees' intention to continue using and participating in the enterprise social networking platform at the higher education community.

Why have I been invited to participate?

I have been selected to participate in the online questionnaire because I am using enterprise social networking as part of my work practices.

Do I have to take part?

It is voluntary but If I am participating in this online questionnaire, I can provide valuable information that will lead her research to measure how these uses drive impacts on the use of enterprise social networking among academic staff within the university.

What will happen to me if I take part?

Participating in this online questionnaire does not take more than 5 minutes and it helps the participant to have a practical and better understanding of how enterprise social networking helps him/ her in job performance.

Are there any lifestyle restrictions? No

What are the possible disadvantages and risks of taking part?

There is no disadvantage to participate in this online questionnaire.

What are the possible benefits of taking part?

By participating in this online questionnaire, I can share my thought and how I perceive, make use of the enterprise social networking, and how it helped me in my job performance.

Will my taking part in this study be kept confidential?

Yes, your participation in this online questionnaire will be kept confidential in accordance with the Data Protection Act 2018 and General Data Protection Regulation (GDPR, 2018) and any identifiers will be removed.

What if something goes wrong?

If you have a concern about any aspect of this study, please feel free to contact Shakiba Kazemian by email: Shakiba.kazemian@brunel.ac.uk who will do her best to answer your query.

What will happen to the results of the research study?

The results of the online questionnaire will be reported in my thesis and analyzed and, the study will be written up into an academic paper and submitted for publication. If you wish to receive a copy of the final paper after your participation, please contact " shakiba.kazemian@brunel.ac.uk".

Ethical review of the study

The project has been reviewed by Brunel University Research Ethics Committee.

Thank you for reading this information.

Appendix H: Questionnaire

1. What is your gender?

    - Male
    - Female

2. What is your age group?

    - 20-34
    - 35-49
    - 50 or over

3. What is your professional position?

    - Professor
    - Associate professor
    - Reader
    - Senior Lecturer
    - Lecturer
    - Postdoctoral Researcher
    - Doctoral Researcher
    - Research and Development staff
    - Other, please specify…

4. How long have you been working at your college?

    - 10 years or more
    - More than 5 years but less than 10 years
    - More than 1 year but less than 5 years
    - Less than 1 year

5. What type of Enterprise Social Networking do you use at your college?

    - Yammer
    - Jive
    - Chatter
    - Slack

- Microsoft Teams

Other, please specify …

6. How long have you been using the platform at your college?

- years or more
- More than 3 years but less than 5 years
- More than 1 year but less than 3 years
- Less than 1 year

7. How often do you use the platform at your college?

- Frequently daily
- Consistently daily
- Weekly
- Occasionally
- Never

8. Please rate the degree to which you agree or disagree with each of the following statements according to the platform you are using at your college.

Appendix H: 1- Questionnaire

Item	Measurements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PE1	Using the platform allows me to accomplish tasks more quickly.					
PE2	Using the platform improves my job performance.					
PE3	Using the platform increases my productivity					
EE1	The platform is easy to use.					
EE2	The platform is easily accessible (e.g., on a mobile device, iPad, laptop)					
EE3	I understand how to use the platform.					

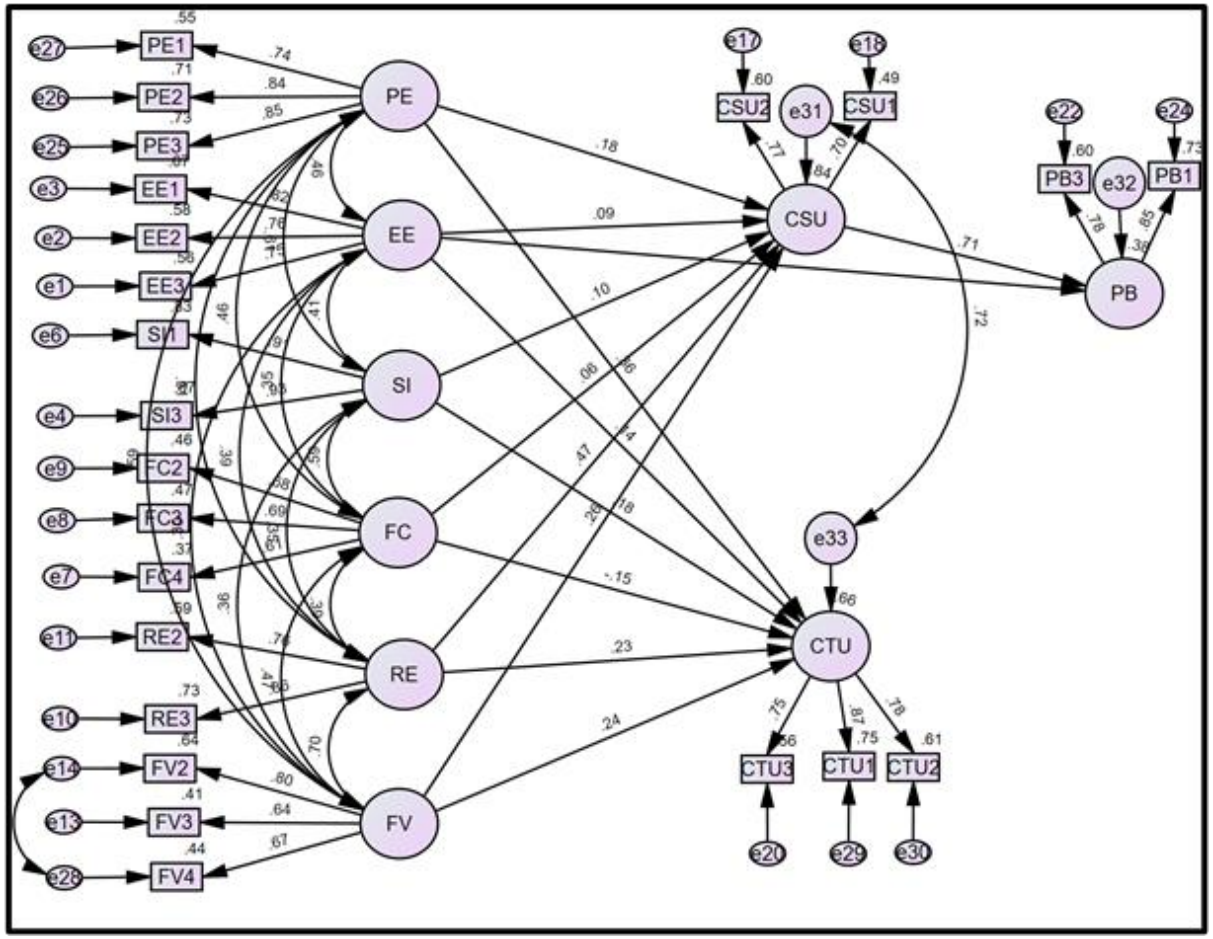
Appendix H: Questionnaire (cont.)

Item	Measurements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SI1	The senior management group in my department are actively participating and using the platform.					
SI2	Many people I work within my department or college participate and use the platform.					
SI3	A significant percentage of people in the university contributes and uses the platform.					
FC1	The department I am working in has a clear purpose for using enterprise social networking at the university.					
FC2	My university has established the platform usage policy and procedure for appropriate participation.					
FC3	My university provides training and education on the use of the platform.					
FC4	A wide range of research activities and events are established on the platform at the university (e.g., grant workshop).					
IV1	The content shared on the platform is current and up to date.					
IV2	The content shared on the platform is valuable and useful to my work.					
IV3	The content/ environment of the platform is engaging (e.g. having informal communication style encourages users to participate).					
FV1	The content/ environment of the platform is engaging (e.g. having informal communication style encourages users to participate).					

Appendix H: Questionnaire (cont.)

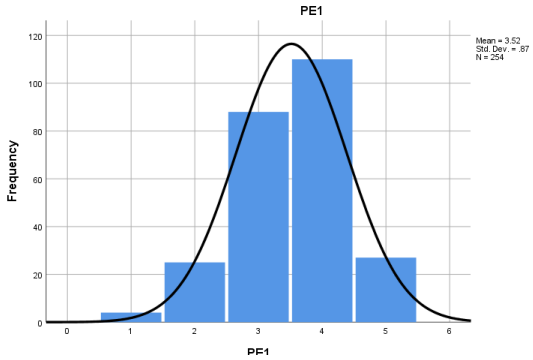
Item	Measurements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
FV2	Using the platform enables me to obtain needed information by easily subscribing to the expert users.					
FV3	I receive more followers when I actively get involved with questions and sharing required information on the platform					
FV4	I re-share posts published by other users when I found valuable and useful.					
RE1	Using the platform strengthens the relations between my colleagues and me.					
RE2	Using the platform grows the range of my connections with other colleagues in the university (e.g. colleagues that might not meet in person from another department).					
RE3	Using the platform creates strong relationships with individuals who have a shared interest in the university.					
CNS1	I use the platform to get the information provided by other users. (e.g., open calls, partner searches, events, news).					
CNS2	I use the platform as a way of acquiring knowledge (by asking for help regarding task-related problems, accessing reports, etc.).					
CNS3	I use the platform to retrieve information made available on the platform (e.g., using topical categorization, #hashtag)					
CNT1	I use the platform to provide information to my colleagues. (e.g., open calls, partner searches, events, grant workshops, general news).					
CNT2	I use the platform to contribute my knowledge to the platform (e.g., posting information about the events that happened before, my experience, etc.).					
CNT3	I use the platform to respond and help my colleague's inquiry post.					
PB1	I have applied for a research funding opportunity from the information shared on the platform, and I received the grant.					
PB2	I have joined the events or workshops posted on the platform.					
PB3	I have applied for an academic research position from the information posted on the platform (e.g., research fellowships).					

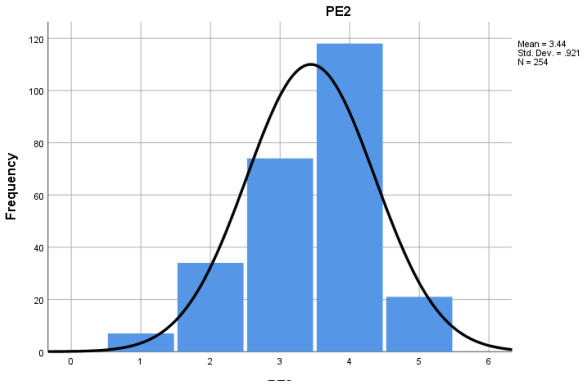
Appendix I: AMOS Graphics- The Conceptual Research Model

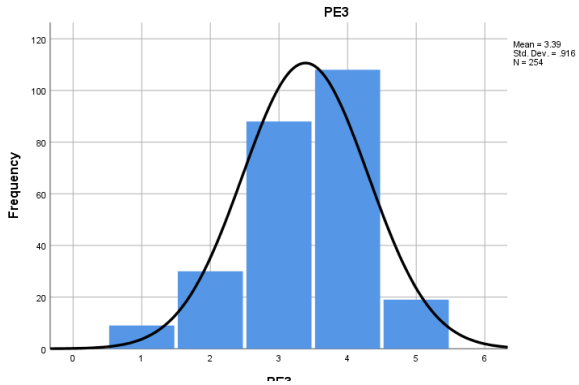


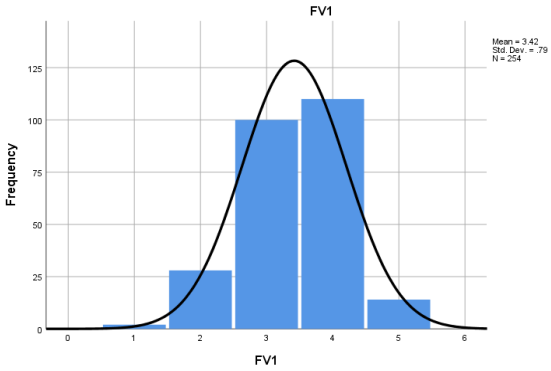
Appendix I: 1- AMOS Graphics- The conceptual model

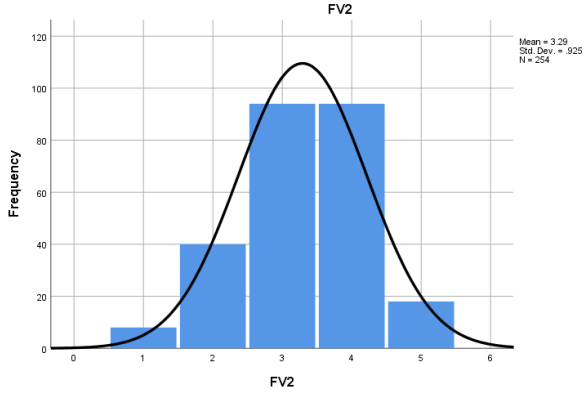
Appendix J: Skewness and Kurtosis Indices for Various Distribution

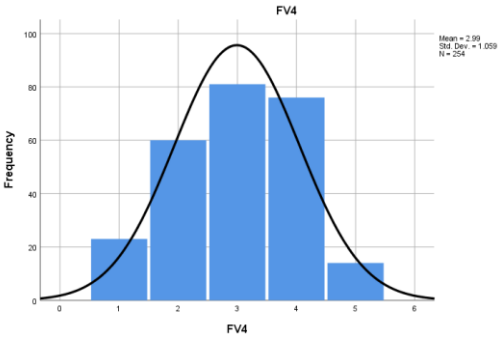


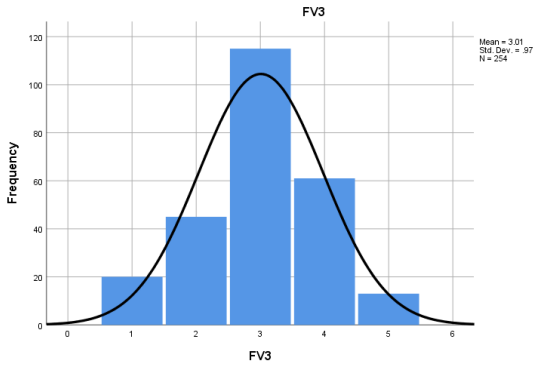




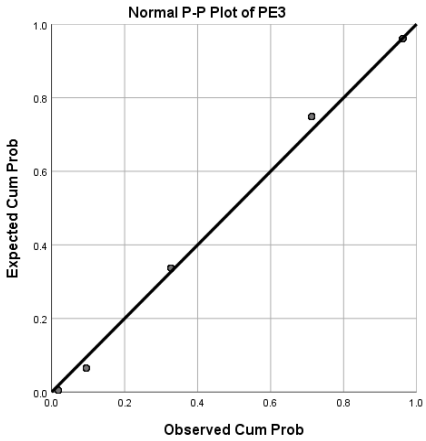


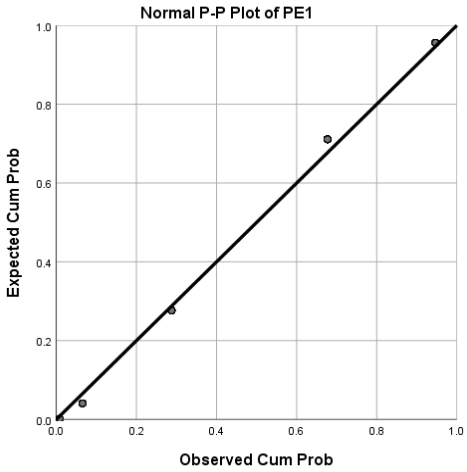


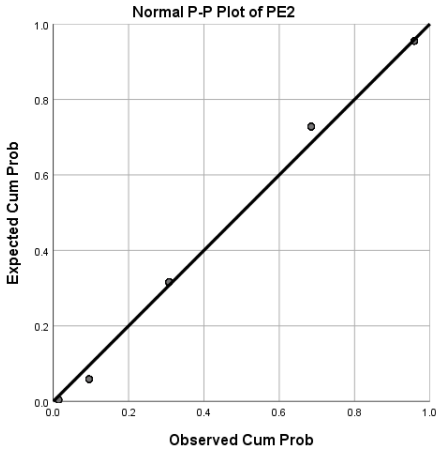


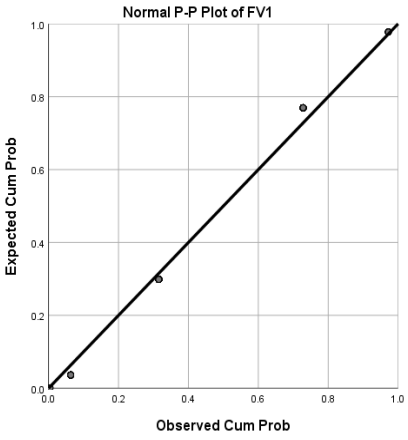

FV3
Mean = 3.01
Std. Dev. = .97
N = 254
Frequency
FV3

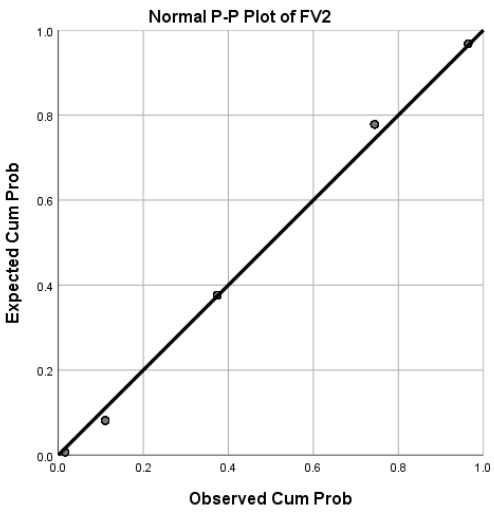
P-P PLOT:

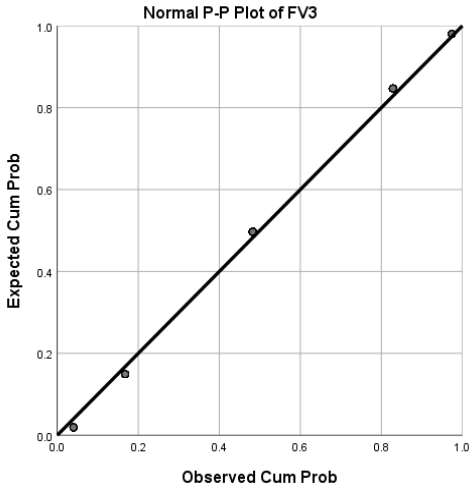

Normal P-P Plot of PE3
Expected Cum Prob
Observed Cum Prob


Normal P-P Plot of PE1
Expected Cum Prob
Observed Cum Prob


Normal P-P Plot of PE2
Expected Cum Prob
Observed Cum Prob


Normal P-P Plot of FV1
Expected Cum Prob
Observed Cum Prob


Normal P-P Plot of FV2
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Normal P-P Plot of FV3
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

Appendix K: Professional Benefits Percentage for Participants

Appendix K: 1 The professional benefit's percentage for each individual

PB1	PB2	PB3	SUM	Percent
2	4	2	8	41.66
2	4	2	8	41.66666667
2	3	2	7	33.33333333
2	5	2	9	50
3	3	3	9	50
3	3	3	9	50
4	1	1	6	25
1	4	2	7	33.33333333
2	4	1	7	33.33333333
1	1	1	3	0
4	4	2	10	58.33333333
2	3	2	7	33.33333333
2	2	2	6	25
3	4	4	11	66.66666667
1	1	1	3	0
2	2	2	6	25
5	5	5	15	100
4	4	4	12	75
2	4	2	8	41.66
3	3	3	9	50
4	4	3	11	66.66
2	2	2	6	25
2	3	1	6	25
2	4	1	7	33.33333333
1	4	2	7	33.33333333
4	2	2	8	41.66
1	3	4	8	41.66
2	5	5	12	75
1	2	2	5	16.66
4	4	4	12	75
4	4	3	11	66.66
5	2	5	12	75
3	4	4	11	66.66
3	5	4	12	75
2	5	1	8	41.66
4	4	4	12	75
3	4	2	9	50
1	1	1	3	0
1	4	1	6	25

5	4	5	14	91.66666667
1	3	3	7	33.33
1	1	1	3	0
2	4	2	8	41.66
2	2	2	6	25
1	4	2	7	33.33
5	2	3	10	58.33
3	4	4	11	66.66
2	4	2	8	41.66
1	4	1	6	25
3	3	3	9	50
1	2	1	4	8.333333333
3	3	3	9	50
1	4	1	6	25
2	2	2	6	25
1	2	1	4	8.33
2	2	2	6	25
1	3	1	5	16.66666667
4	4	4	12	75
3	4	2	9	50
5	3	3	11	66.66
5	5	5	15	100
1	2	1	4	8.33
1	3	4	8	41.66
3	1	1	5	16.66666667
2	2	1	5	16.66
3	2	3	8	41.66
2	3	2	7	33.33
1	3	1	5	16.66
5	5	2	12	75
3	4	3	10	58.33
3	4	3	10	58.33
2	4	2	8	41.66
2	2	2	6	25
4	4	4	12	75
5	4	4	13	83.33333333
1	3	1	5	16.66
2	4	2	8	41.66
1	1	1	3	0
4	4	3	11	66.66
1	3	3	7	33.33
1	1	1	3	0
3	5	3	11	66.66
2	4	2	8	41.66
3	2	2	7	33.33
1	4	3	8	41.66

4	5	4	13	83.33
4	4	5	13	83.33
2	4	2	8	41.66
3	4	4	11	66.66
3	2	2	7	33.33
4	3	4	11	66.66
3	4	3	10	58.66
4	4	4	12	75
4	4	4	12	75
3	3	3	9	50
3	4	3	10	58.66
4	4	4	12	75
3	5	4	12	75
4	4	2	10	58.66
1	1	1	3	0
3	4	4	11	66.66
3	4	3	10	58.66
2	2	1	5	16.66
4	4	3	11	66.66
1	5	1	7	33.33
1	4	1	6	25
4	4	4	12	75
4	4	4	12	75
1	4	1	6	25
3	1	1	5	16.66
1	5	1	7	33.33
1	2	1	4	8.33
2	4	2	8	41.66
2	2	4	8	41.66
3	4	4	11	66.66
4	4	1	9	50
2	2	1	5	16.66
3	4	2	9	50
1	3	5	9	50
1	3	1	5	16.66
2	4	2	8	41.66
4	4	4	12	75
3	3	1	7	33.33
1	1	1	3	0
3	3	3	9	50
1	4	1	6	25
4	4	3	11	66.66
3	3	3	9	50
1	3	2	6	25
1	4	1	6	25
2	2	2	6	25

4	4	3	11	66.66
1	1	1	3	0
1	3	1	5	16.66
3	3	3	9	50
2	4	2	8	41.66
1	2	1	4	8.33
1	5	1	7	33.33
3	4	3	10	58.33
3	3	3	9	50
4	3	3	10	58.33
2	4	5	11	66.66
1	4	2	7	33.33
1	1	1	3	0
3	5	2	10	58.33
4	4	4	12	75
3	4	3	10	58.33
2	2	2	6	25
2	3	2	7	33.33
1	4	1	6	25
3	4	2	9	50
2	2	2	6	25
3	3	3	9	50
3	3	3	9	50
2	2	2	6	25
4	4	3	11	66.66
2	4	2	8	41.66
4	5	1	10	58.33
1	4	2	7	33.33
1	1	1	3	0
2	4	2	8	41.66
1	3	2	6	25
1	2	1	4	8.33
3	3	3	9	50
1	4	1	6	25
1	1	1	3	0
2	4	2	8	41.66
3	3	3	9	50
1	2	1	4	8.33
5	4	4	13	83.33
3	3	3	9	50
4	4	4	12	75
2	4	2	8	41.66
2	4	2	8	41.66
2	4	1	7	33.33
4	3	3	10	58.33
2	2	2	6	25

2	2	2	6	25
2	2	2	6	25
2	2	2	6	25
3	5	4	12	75
4	4	2	10	58.33
2	4	4	10	58.33
2	2	2	6	25
4	4	4	12	75
1	2	1	4	8.33
3	4	3	10	58.33
4	2	1	7	33.33
2	4	2	8	41.66
1	1	1	3	0
3	3	2	8	41.66
5	4	5	14	91.66
1	2	2	5	16.66
3	3	3	9	50
3	3	3	9	50
3	3	4	10	58.33
1	1	1	3	0
2	2	2	6	25
1	1	1	3	0
2	2	2	6	25
2	3	2	7	33.33
1	3	1	5	16.66
2	4	4	10	58.33
4	4	4	12	75
3	3	2	8	41.66
1	1	1	3	0
2	4	2	8	41.66
1	4	1	6	25
1	3	1	5	16.66
3	2	3	8	41.66
1	2	2	5	16.66
1	4	1	6	25
3	4	3	10	58.33
1	1	1	3	0
2	2	2	6	25
1	1	1	3	0
3	3	3	9	50
1	1	1	3	0
4	2	2	8	41.66
1	5	1	7	33.33
1	1	1	3	0
3	3	3	9	50
3	3	3	9	50

3	3	3	9	50
1	1	1	3	0
2	2	2	6	25
1	1	1	3	0
3	3	2	8	41.66
2	4	1	7	33.33
1	2	1	4	8.33
1	4	1	6	25
3	5	3	11	66.66
3	3	2	8	41.66
4	4	4	12	75
3	3	3	9	50
3	2	2	7	33.33
1	1	1	3	0
5	4	1	10	58.33
3	3	3	9	50
3	3	3	9	50
2	2	2	6	25
2	2	1	5	16.66
1	1	1	3	0
1	2	1	4	8.33
2	3	2	7	33.33
2	2	2	6	25
2	2	2	6	25
2	2	2	6	25
2	2	2	6	25
4	5	4	13	83.33
3	3	2	8	41.66
1	1	1	3	0
2	4	2	8	41.66
2	2	2	6	25

Appendix L: The Procedure of Focus Group Coding (Coder 1 and Coder 2)

1. **How has Microsoft Yammer helped you today?**

Appendix L: 1 -How has Microsoft Yammer helped you today? (Initial coding)

How has Microsoft Yammer helped you today?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
1	For me, Yammer is not necessarily about today but specifically my collective experience using Yammer at the university; it helped in disseminating and sharing timely information with the audiences in research and the development support office worked with. That is one of our keys uses and two main coders found out that it is a helpful platform to communicate information in a timely way, knowing that it is safe and secure, that it can be viewed only by members of our community within the university.	My collective experience, Used the platform for a long time Disseminating and sharing timely information, Sharing research calls and news, Communicating in a timely way Safe and secure platform, Viewed only by university members	Sharing timely information (3) Safe and secure platform (2) Promoting funding opportunities and news (5)
2	So today, I have not particularly used it. But since I started university in November, I found from Yammer myself that two research academic audiences are using the platform. I started using Yammer 10 days ago and created a group "Project Management and Change Management across the university" 10 days ago. Two main coders have got 45 members now. People are really scared about putting opinions on the platform, because they are never about what they say.	Heard about Yammer from academics Recently joined, Created own group with my colleagues	Communicating promptly (3) Collaboration (4) Building a friendship (4)

Appendix L.1 How has Microsoft Yammer helped you today? (Initial coding) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	But my experience about using Yammer is that it has already started to help the group to collaborate and connect people from different sides or areas of the university, because I am quite good at Yammer and I know how to work well with Yammer and I will be chatting about one of my projects. How it helps me is in collaboration, because basically you can share files, you can do polls, you can do more social interaction, so you can keep it more casual in the forms of communication. So, in terms of collaboration in a group, it really does help people to meet each other and coexist with a regular in-person network… running… So, if you do not meet a person, in person, it helps you to build a friendship with them.	Being scared to contribute on the platform, no experience of using Yammer Being experienced with using Yammer, Training my colleagues Collaboration and building relationships Being professional Collaboration in a group, Meeting new people, Building a friendship	Being scared to contribute on the platform (1) Stop using Yammer (1)
3	To create research awareness: funding opportunities, funder policy, intelligence, university policy, etc....	Creating research awareness ,promoting funding calls, updating funder policy news	Promoting funding opportunities and news (5)
4	Make them aware of research funding opportunities and news from the funder that I manage.	Disseminating information, promoting funding calls	Sharing timely information (3), Promoting funding opportunities and news (5)

Appendix L. 1 How has Microsoft Yammer helped you today? (Initial coding) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
5	I use Yammer to disseminate information about funding calls.	Disseminating information, promoting funding calls	Sharing timely information (3), Promoting funding opportunities and news (5)
6	It has not helped me much in my career, just allows me to communicate with colleagues, socializing (recreational activities).	Not help me in my career progression, having communication, Socializing	Building a friendship (4) Socialising (3)
7	I have not used it recently, I used it before (at early stages). Communicating with colleagues and socializing. Then I stopped using it because there wasn't a lot of activity there.	Having communication, socializing, low engagement, left the platform	Socialising (3), Low engagement (1) Stop using Yammer (1)
8	Allows me to communicate with colleagues, social events, etc. (funding opportunities).	Finding funding calls	Funding opportunities and news (5)
9	It helped me find information regarding research funding.	Finding funding calls	Funding opportunities and news (5)

Appendix L. 1 How has Microsoft Yammer helped you today? (Initial coding) (cont.)

How has Microsoft Yammer helped you today? (cont.)			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
10	It helped me find information regarding research funding. Also, many networking events take in universities. So I can meet new people which help me in my career progression.	Participating in networking events Building a relationship, Future collaboration, Career progression	Funding opportunities and news (5)
11	Find out about H2020 programme, which means I will join the programme to find out more about calls.	Finding funding calls, Joining the work programme	Networking (3) Joining workshops (2) Collaboration (4)
12	It helped me to find out more about upcoming research opportunities, Also, research administrators provide many "writing a successful proposal" workshops, which helps me as a junior researcher applying for grants. Also, many networking (brokerage) events are held in the university. So I can be notified and take part in these events.	Finding funding calls, Attending workshops, Networking events Collaboration	Funding opportunities and news (5) Collaboration (4) Building a friendship (4)

Step Two: Using Sorting Strategy to Develop Themes (Moving from Codes to Categories and Themes)

Appendix L: 2 How has Yammer helped you today? - Using sorting strategy to develop themes

Codes	Generality (out of 16 participants)	Frequency
Sharing timely information	3	3
Promoting funding opportunities and news	4	5
Finding funding opportunities	4	4
Communicating promptly	5	4
Safe and secure platform	1	2
Collaboration	5	4
Building a friendship	5	4
Socialising	4	2
Networking	3	3
Joining workshops	2	2
Being professional	1	2
Training staff	1	1
Being scared to contribute on the platform	1	1
Inexperienced	1	1
Low engagement	1	1
Stop using Yammer	1	1

Step Three: Identifying the Dominant Codes + Generating Categories/Themes to Address the Research Questions

Appendix L: 3 How has Yammer helped you today? - Identifying the dominant codes

Identifying the dominant codes	Codes
Cluster 1: Funding opportunities and funder policy news- Open calls	Promoting funding opportunities and news (5) Finding funding opportunities (4) Sharing timely information (3)
Cluster 2: Building a friendship	Socialising (2) Networking (3) Building a friendship (4)
Cluster 3: Collaboration	Joining workshops (2) Collaboration (5)
Cluster 4: Developing common ground	Sharing timely information (3) Communicating promptly (4)
Cluster 5: Feature value	Safe and secure platform (2)
Cluster 6: Emotional anxiety	Low engagement (1) Being scared to contribute to the platform (1) Inexperienced (1) Stop using Yammer (1)

Step Four: Generated Themes and Categories for the Question "How has Yammer Helped you Today?"

Appendix L: 4 How has Yammer helped you today?- Generating themes

Outcome (the key usage of ESN)
5 Funding opportunities and funder policy news- open calls
1.6 Building a friendship
1.7 Developing a common ground
1.8 Collaboration

2. Have you tried to get to know what others have been posting on the platform, which may help you develop a more accurate perception /picture of a person (as an expert) and expand your relationship across the organization (e.g., getting to know colleagues and their competencies, etc.? better? characteristics)? (If yes, share your experiences through conversation you had in informal communication with people on Yammer) (Building person perception and building a relationship)

Appendix L: 5 Have you tried to get to know people? (Initial coding & focused coding)

Have you tried to get to know people?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
1	**Staff:** So, in my opinion, I know that social media is all about fake news, and whatever is out there, it doesn't necessary 100% true, If you really want to get to know somebody. when I was at university B College, I have a chat with him (a colleague) about interesting topic, then I said something and am I agree or disagree or If I want to know about it more, after I have a little chat on Yammer and I asked him to meet for a coffee because I really like in general to meet people in person. So, for me, Yammer is great because you can do when you are working in many different ways. After certain of number of times, I always like to have a face-to-face interaction with someone. It is not saying about that Yammer or only Yammer stuffs afterwards, but it is just like a **<u>supplement it. (supplement).</u>** Not just using Yammer on its own, it just like that I am not really sure who I am talking to. (it is like talking to someone the internet, you don't know who you are talking to in real, except in the university because you can see the staff's profile and I just we need to get to use both (Yammer+ meet people in person).	Fake news on social media Not trustful/ Chatting on Yammer Getting to know in person Memo: (talking about her previous experience of using Yammer, University B) Preferring to meet people in person supplement tool Yammer playing as a supplement tool Not quite trustful (only Yammer) Talking with someone on internet Finding out the staff's profile Getting to use both /Online and in person interaction Yammer+ meet people in person	Getting to know somebody Building a friendship Chatting on Yammer with new people Meeting people in person Being interested in Face-to-face interaction Requiring both online and in-person interaction **(Yammer+ meet people in person).** Finding out the staff's profile Getting to know people

Appendix L. 5 Have you tried to get to know people? (Initial coding & focused coding) (cont.)

Have you tried to gey to know people?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
2	Research administration 1**:** I think one of the things that my colleagues from RSDO would say that RSDO has always have been a soft open-door policy with kind of that culture with academics are encouraged to come in person because of the relationship and the nature of the work they are doing. So, there is this relationship with academic staffs, that they prefer to come in person at our office. And this is one of our strengths RSDO. And some of like this kind of platform, Yammer, when we launch Yammer at the first high ranking university, we always want to supplement that relationship to have a face-to-face relationship. I think the Yammer usage it quite reflective of the types of people who are coming to the office as well. It almost like a mirror. Once a person who is always active and physically coming to our office and pulling up a chair and seating and talking about the application. Other ones they tend to use Yammer more as well. And other one's exchange or corresponds the posts by email or telephones. A part of this Yammer group, we would never have or very really rare people who engaged by putting a comment on a post or write a reviews or opinions. It those people who trying to engage more with Yammer, although we kind of quite know who our audiences to some extents are. But we trying to figure out how to we get them into office and how we get them into Yammer as well.	Having soft open-door policy Encouraging academic to meet them in person RSDO policy Build a relationship Preferring to meet people in person Supplement tool Build a relationship Face-to-face interaction Getting responses by emails and calling Creating a culture Getting responses via private channel Very rare Low engagement Rare contribution on the platform	Being interested in Face-to-face interaction Playing as Supplement tool Building a relationship Being interested in Face-to-face interaction Getting responses by emails and calling Creating a culture Low engagement No contributing to the platform.

Appendix L. 5 Have you tried to get to know people? (Initial coding & focused coding) (cont.)

Have you tried to gey to know people?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
3	Research administration 2: I read my colleagues posts to be informed but not to develop relationships within the university.	Trying to improve the collaboration on the platform	Dominant group (RSDO) Getting responses via private channel
4	Research administration 3: Only RA people post on the platform, and they are my colleagues, and its rare any other user post on the platform. We only receive many responses to our posts out of the platform and academic comes to our office and we help them with applications. So, I can say that I didn't build a friendship with anyone on the platform.	Only reading my colleague's post No contribution Only dominant by RSDO	visiting RSDO office- Resisting engagement on the platform
5	Research administration 4: Yes, I look at what others are posting. Also, I tried to build a relationship with others. Since we are promoting upcoming calls, we receive many responses out of Yammer. Then people come to our office about the call or email me, I start to get to know them and build a friendship for future collaboration.	Receiving via private channel Preferring to visit RSDO office Asking for help with applications. No build a friendship on the platform	Asking for help Not build a friendship on the platform
6	Research administration 5: No, I have not, because no one post on the platform except from us (RSDO) people.	Receiving many responses via private channel Promoting upcoming calls	Open calls Resisting engagement on the platform
7	Academic staff: Yes, especially after the start of this year.	Preferring to visit RSDO office Meet people in person Build a friendship	Meet people in person Build a friendship- Resisting engagement on the platform

Appendix L. 5 Have you tried to get to know people? (Initial coding & focused coding) (cont.)

Have you tried to gey to know people?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallizing the significance of the points (comparing data with data)**
8	Academic staff: I think it happened long time ago once, I find out their background actually and to see if their background is relevant to contribute to some research and data gathering. Not taking them to participate in my research, but in data gathering only.	Low engagement Meeting new people via promoted events	Meeting new people via promoted events
9	Academic. Staff: Yes, I use Yammer since 2015, once I start to use the platform for upcoming new funding opportunities, I met new people (RSDO). Regarding the call, I emailed them and then I met them in person. Also, during the pandemic, there were a new community called "homeworking hub", which helps me with getting tips about to keep my routine work and not being distracted working from home. Also, there were plenty of online yoga classes offered by staff in university, these activities help to cope with the tough situation.	Building a friendship in Socialising events Meeting new people Finding colleague's background Met a new friend on the platform Building a relationship For collaboration Getting help for data gathering. Met new people in person Visiting RSDO office for funding opportunities Emailed RSDO staff	Building a friendship in Socialising Meeting new people Building person perceptions **Resisting engagement on the platform** Visiting RSDO office for funding opportunities Emailed RSDO staff

Step Two: Using Sorting strategy to develop themes: (moving from codes to categories and themes)

Appendix L: 6 Have you tried to get to know people? - Using sorting strategy to develop themes

Codes	Generality (out of 12 participants)	Frequency
Getting to know people	2	2
Building friendship	5	5
Chatting on Yammer with new members	1	1
Meeting people in person	3	2
Being interested in Face-to-face interaction	2	2
Playing as a supplement tool	3	2
Meeting administrations in person	2	2
Resisting engagement on the platform	3	3
Creating a culture	1	1
Resisting engagement on the platform	2	2
Dominant group (RSDO)	1	1
No contributing to the platform	1	1
Socialising event	1	1
Meeting new people	5	5
Future collaboration	2	2
No build a friendship	1	1

Step Three: Identifying the dominant codes + Generating categories/themes to address the research questions

Appendix L: 7 Have you tried to get to know people? - Identifying the dominant codes

Cluster 7: building person perception	**Cluster 2: Building a friendship**	**Cluster 8: resisting engagement on the platform**
Getting to know people (2) Socialising event (1) Future collaboration (2)	Building friendship (5) Chatting on Yammer with new members (1) Meeting people in person (3) Being interested in Face-to-face interaction (2) Playing as a supplement tool (3) Creating a culture (1) Socialising event (1) Meeting new people (5)	Resisting engagement on the platform (2) Resisting engagement on the platform (2) No contributing to the platform (1) Dominant group (RSDO) (1) No build a friendship on the platform (1)

3. I have a question from what you (p2) said about the project group you have on Yammer. You said that "Many people are scared to post or make a comment on Yammer". Do you think why they do not want to share a post or make a comment on Yammer?

Appendix L: 8 Why do they not want to share a post or make a comment on Yammer?- (Initial coding & focused coding)

Why do they not want to share a post or make a comment on Yammer?			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	Staff: Partly, it is just social media anyway, on the internet you always happy having followers on social media and participate and share information on the internet. It is just normal! But in a working environment, people are even more scared, because they are worrying "Am I said wrong thing?" or If they just disagree with somebody's in a post and they upset somebody's else and see then. You just need to encourage people that this is a safe environment that they are really on and there are no consequences of opponent with different opinions. What does it help them? Sets some ground rules about the types of things that won't be accepted, e.g., types of language, incidents of cyber bullying or something like that will be. Just making some expectation that how they expect people behave in a group and help to make some boundaries.	Being happy to use - Adding new connection - Being attracted to participate Usual stuff (**Memo:** The difference of using social media tools for organizational use vs personal use)- being scared - being worried Upsetting people with opposite opinion Encouraging people to participate- A safe environment - Trying to break the ice Setting some ground rules ***(establishing the guidelines)*** **(defining a low or policy)** Defining a type of languages - Immuning cyberbullying - Making some boundaries	Being excited to participate for personal use - Working environment - Withdrawal user's behaviours - Being scared to express their ideas - Being worried Encouraging employees Safe and secure platform - Setting some ground rules Immuning cyber bulling Making some expectations Making some boundaries
	Interviewer: Do you think that people avoid using Yammer because they don't trust or what other factors may impact to use it?		
2	Staff: I think a lot of things affects! Trust and culture are one aspect. Training and even knowing the system are another aspect. People don't know about the system, and they don't know how to use it. Some people might see the social media is not what they are actually doing at the edge of their work. So, you know, I am actually work on	Trust and culture- Training- Having prior experience of using ESN- Not knowing the system - Not useful tool (wasteful technology)	***Key barriers of using Yammer*** Cultural barrier- Less Training No prior experience of using Yammer

Appendix L: 9 Why do they not want to share a post or make a comment on Yammer?- using sorting strategy ot develop themes

Codes	**Generality (out of 2 participants)**	**Frequency**
Withdrawal user's behaviours	2	4
Being scared to express their ideas	2	2
Working environment	1	1
Being worried	1	1

Appendix L: 10 Why do they not want to share a post or make a comment on Yammer?- using sorting strategy ot develop themes

Codes	Generality (out of 2 participants)	Frequency
Cultural Barrier	1	1
Lack training	1	1
Hard to understand the system	1	1
Staff's perception	1	2
Waste of time	1	1
Useless tool	1	1

Appendix L: 11 Why do they not want to share a post or make a comment on Yammer?Identifying dominant cods

Clusters:	
Cluster 9: Diving behaviour	Withdrawal user's behaviours (4) Being scared to express their ideas (2) Working environment (1) Being worried (1)
Cluster 10: Lack of organisational and technical support	Lack training (1) Hard to understand the system (1)
Cluster 11: Improving user engagement	Setting some ground rules (1) Immuning cyber bulling (1) Determining a type of language (1) Making some expectations (1) Making some boundaries (1)
Cluster5: Feature value	Safe and secure platform (1)

4. Has Yammer features helped you promote the core values, such as hashtag, seen by and view insight groups (e.g., #Horizone2020, Seen BY., View insight the groups)? (Assessing the core values in Yammer) (hashtags feature, seen by feature, view group insights)

Appendix L: 12 Feature value- (initial coding & focused coding)

Feature value			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Research administration1: To be honest, I don't know because I never measure it. I have not done any metrics on the Hashtags # Surly, on our contents, we try to use **consistent tags,** for example against EVENTS, we do an event, we communicate in there, we talk about it. But we haven't done any meaningful metrics on that. So, I don't know the answer to this question. If It helped us to communicate our core values, using special features (#topic), But certainly, things like (SEEN BY) feature, it about that how many people have seen the post.	Not measured hashtags feature Using tagging for contents Using tagging for event's announcement Helped to communicate our core values Another key feature "SEEN BY" feature (MEMO: emphasizing) The number of people sees posts	Yammer features - Hashtag's feature Using consistent tags for event announcement - Helped to communicate our core values "SEEN BY" feature - Showing number of people seen the post
	Interviewer: Although, this kind of feature (SEEN by) happened a year ago and before around 2017 we could find that how many audiences have.	A new feature "SEEN BY"	
1	Research administration1: absolutely, Yes, I think that I don't know what the value it is, because I think It is quite deceptive, looking at the numbers, base in succeeding on that, the higher number of people seen the posts, but it is interesting to find out more about some of these features, and how make a trace more about them. It is interesting to learn more about.	Not realizing the value of this feature ´ Deceptive feature Being interested to learn more about	Being interested to trace this feature
	Interviewer: Does it helps the core values (#hashtag) in other university (University B)? Does it more interesting for people when we are using # hashtag while we are sharing a post?		Yammer feature

Appendix L. 12 Feature value- (initial coding & focused coding) (cont.)

Feature value			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	Staff: I think it does help with searching stuffs on Yammer. That's why we encourage to use #hashtag. Because we are using Yammer for many years at University B, and we have a lot of contents in University B and lot of cites. So sometimes with searching some stuffs on Yammer, and you just have to know what kind of tags you think we would use at University B and then you can search for it. So, that's helpful for us and we have University B expectations which is one of our values to use #hashtag. SO, I just going back to your point about analytics. I think the number of users who have looked something Interesting But for the social media, you really want the number who is below engaged. That is very low here (UNIVERSITY A). And also, you can find the analytics on the down the side on a right side of Yammer page, there is a analytic things, click on it and it gives you some graphs and about the number of people who are active, share post, read post.	Using hashtags for searching Creating a lot of contents Using Yammer for many years (settled) - Using tags to find an information easily Helpful feature - A valuable feature Talking about analytics (*assessing core values of Yammer features)* - "seen by" feature -Low engagement Getting more accurate results -Finding analytics Seeing the behind scene of Yammer	Searching content by using hashtags - Encouraging to use hashtags feature - Helpful feature (#) - A core value to use hashtags- Measuring the user's engagement - Finding the analytic outcomes - Seeing the behind scene of Yammer Viewing the group insights on Yammer Low engagement
3	Research administration2: No being old school I don't really understand hashtags etc	Being old school- Not knowing the feature	Not using the feature
4	Academic staff: I don't use it enough to benefit from these features	Not using Yammer, a lot	
5	Academic staff: Yes, Hashtag features to find a specific call	Using hashtags to find a specific call	Using hashtags
6	Academic staff: Yes, Hashtag features to find a specific call	Using hashtags to find a specific call	Using hashtags
7	Academic staff: Yes, Hashtag features to find a specific call	Using hashtags to find a specific call	Using hashtags

Appendix L. 12 Feature value- (initial coding & focused coding) (cont.)

Feature value			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
8	Academic staff: I noticed to "Seen by" , how many people see the posts. Also, I look into "view insight group" to justify Who I need to contact	Checking SEEN BY feature Looking into "view insight group" Justifying who I need to contact	Justifying who I need to contact- Using "Seen by" and "view group insight"
9	Academic staff: Yes, I use hashtag to find the key word in calls, because RSDO staff post upcoming calls daily and it a lot of information to scrolling down the page, using hashtag help me to find the call quicker. Also, I have tried other features such as making bold etc. when I post on the platform. I believe that making bold helps your audiences pay more attention and you get reply quicker.	Using hashtags to find a specific call Easier to find the call Making bold the content for attracting more audiences	Using hashtags to find a specific call (2) - Making bold the content for attracting more audiences

Appendix L: 13 Feature value- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
Yammer Feature	2	2
Tagging	2	2
Using consistent tags for event announcement	1	1
Communicate our core values	2	2
Seen By feature	4	3
A new feature	2	2
Searching content by using hashtags	1	1
Encouraging to use tagging	1	1
Helpful feature	2	2
Measuring the user engagement	1	1
Finding the analytic outcomes	1	1
Seeing the behind the scenes	2	2
Viewing group insight feature	2	2
Low engagement	1	1
Not using the Yammer features	2	2
Using hashtags to find a call	4	5
Justifying who I need to contact	1	1
Making bold the post	1	1
Attracting more audiences	1	1

Appendix L: 14 Feature value- Identifying dominant codes

Cluster 5: feature value	**Cluster 8: resisting engagement on the platform**
Using hashtags to find a call (5) Using consistent tags for event announcement (1) Searching content by using hashtags (1) Justifying who I need to contact (1) Attracting more audiences (1) Making bold the post (1) Seeing the behind the scenes (2) Communicate our core values (2) Tagging (2) Seen By feature (4) Measuring the user engagement (1) Finding the analytic outcomes (1) Seeing the behind the scenes (2) Viewing group insight feature (2)	Not using the Yammer features (2) Low engagement (1)

Section two: Issues with using Yammer (scenario- based questions)

5. common question: “my organization has Yammer, but no one is using it. Should I replace Yammer with some other social media tools?” The tool itself rarely is the cause of a low engagement rate. (The Challenges of Adopting the Use of Technology)

Appendix L: 15 The challenges of adopting the use of technology- (Initial coding. & focused coding)

The Challenges of Adopting the Use of Technology			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Staff: I think Yammer is great. But I think what it makes a difference with using Yammer at University B is that a lot of people from the central comes got behind it and start to use it and understand it. The senior leaders who started to understand it and start to do some stuffs on it. Use it and set up groups. It seems to me that it was well adopted by IS department and there was not any training, any kind of promotion or campaigns, or no training or saying; you know any benefits of high collaborating using it. None of these things done or happened or even on emailing is missed. - A part of my job here is to help university A to roll out more features of office 365, also a part of my job allows to grow Teams (Microsoft Teams), and I think that we should have Yammer and Microsoft Teams here, because I think they are two different things and different audiences. So, I think we should still have it. - But I think the whole adoption and engagements piece (case). And I think if you come to people who they were using more and maybe you need to socialize them and try to get them understand about the significance of (Microsoft Teams) and try to engage them to start using it and engaging, it would be really helpful.	A great tool - No need to replace *Comparing how Yammer promoted at University B*- Attracted by many staff and. senior leaders - Senior leaders - Well-adopted by IS department No training before - No promotion before - Not advertising before - No emails received about Yammer introducing *Talking about Yammer at university A* A part of her role - Helping employees with office 365 features *Yammer is one of office 365 features.* Growing Microsoft Teams and Yammer usage among staff - Different audiences Keeping both tool (Teams and Yammer) Working on engagement and adoption overall Helping users to socialize with each other - The significance of ESN tools	University B: A great tool - No need to replace- Using by many senior leaders - Setting up groups - Well adopted by IS department in other organization - No training at initial phase- Not defined any benefits of using Yammer for staff University A- A part of my job in the first high ranking university- Training employees with office 365 apps - Developing Microsoft Teams and Yammer usage between employees - Keeping both platforms for educating about the importance of Teams for active users - Helping users to socialize with each other

The Challenges of Adopting the Use of Technology			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	**Research administration 1:** Absolutely, I am very much echo that as well. I was very much in part of that conversation with information services, and I found that all these range, it was information system that helped to launch it (Yammer Platform), you know, Because I would expect a bit more from marketing communication to come on board and say "we got this great tool which could really, mm… you know it could add some value to our conversation here in the university" But at that time, I think the university was engaged a lot of more different things and a lot of changes were going on. So, it is kind of … as a tool…. **It's kind of fell like a wayside. *** And Mm…. when I discovered it, I said, I asked if I could do **soft launch*** for our particular community and audiences and they were quite happy for us to do that. But we would never get to receive the support needed but I could benefit, like **training,** it just like web content training, how to write this kind of contents (posts) on the platform, and all these things. I think internal social media tools could be massively beneficial with some sort of training pushed., and also, you **know <u>top-down leadership</u>** you know actually using it. And it would be a real cultural change, it would be **"game change" *** I would say to answer this question is should we replace Yammer with other kind of tools? Absolutely Not, because it's a great tool, lot of potentials, it just needs wait behind it and needs lot of publicity and getting people to really see the benefits of the platform.	Being agree - Same opinion- Discussed with IS service Assisting with launching Yammer - Supported by Information System (management support) - Expecting from marketing communication - Expected to promote by marketing communication Enhancing our conversation values by employing Yammer - Busy with other stuff- Disregarding the value of Yammer - Not paying attention Falling by the wayside- Not using it (dropping it out) - Soft launching Doing soft lunch for our community (RSDO)- Employing for our specific research group Not received any help- Independent training Self-governing - Writing posts on the platform- Beneficial internal social media tools - Requiring training- Requiring top-down leadership- Game changer A real cultural change- Not replacing with other internal tools - Requiring a lot pf publicity - Getting help for promoting Yammer - Recruiting influencers- Educating people- Informing the benefits of Yammer	Being agree- Information system supports for-launching Yammer Expecting from marketing communication - No support received form marketing team - Being busy with other stuff **Falling by the wayside** Doing a soft launch for our community - Not received any help from the university Independent training - Training for content creation - Being beneficial for employees Requiring training- a lot of publicity- Requiring top-down leadership - Getting employees to understand the benefits of Yammer

Appendix L: 16 The challenges of adopting technology- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
A great tool- No need to replace	4	4
Training employees with office 365 apps	1	1
Improving Microsoft Teams and Yammer usage between employees	1	1
Keeping both platforms for different uses	1	1
Educating about the importance of Teams for active users	1	1
Being agree	1	1
Information system supports for launching Yammer	1	1
Expecting from marketing communication	1	1
No support received form marketing team	1	1
Being busy with other stuff	1	1
Not paying attention	1	1
Falling by the wayside	1	1
Doing a soft launch for our community	1	1
Not received any help from the university	1	1
Independent training	1	1
Web content training for our community	1	1
Training for content creation	1	1
Being beneficial for employees	1	1
Requiring training	2	2
Requiring top-down leadership	1	1
Requiring a lot of publicity	1	1

Appendix L: 17 Challenges of using technology- Identifying dominant codes

Cluster 11: Improving user's engagement	**Cluster 10:** Lack of organizational and technical support	**Cluster 8:** resisting engagement on the platform / figurative culture
Training employees with office 365 apps (1) Improving Microsoft Teams and Yammer usage between employees (2) Educating about the importance of Teams for active users (1) Requiring Information system supports for launching Yammer (1) Training for content creation (1) Being beneficial for employees (1) Requiring top-down leadership (1) Requiring a lot of publicity (1) Getting employees to understand the benefits of Yammer (1) Doing a soft launch for our community (1) Independent training (1) Web content training for our community (1)	Expecting from marketing communication (1) No support received form marketing team (1) Being busy with other stuff (1) Falling by the wayside (1) Not received any help from the university (1) Independent training (1)	A notice board (1) Avoiding corresponding on Yammer (5) A strong culture barrier (3) Being used to traditional methods (email, telephone, walk-in) (1)

6. What kind of user adoption resources and methods have we used? How do we get people to use the system (Yammer)? (User adoption resources and methods used)

Appendix L: 18 Improving user engagement - (initial coding & focused coding)

Improving user engagement			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Research administration1: When we launched a number of years ago. I ran a series of workshops upstairs (room 357), it was about 4 or 5 sessions where I invited interested people (administrators, users) to come along basically just about 7 or 8 power points slides to spoke little about best practise, what it is? What it isn't? how to write or produce a good content? How to engage people? That was helpful in user adoption, getting people confident and using it. That was something initially we did. That was our team's aim to get people actually use it and be familiar with it. Hopefully, that was a word of mouth spread and it did. So, you know for our purposes, that quite was successful.	**(Talking about past)** Launched Yammer several years ago. Ran a series of trainings. Invited interested people - Short power point slides - Short introduction to Yammer - Producing good content on Yammer- Helpful trainings- Getting people confident- word of mouth sharing - Getting familiar with the technology	Launched Yammer several years ago. Ran a series of workshops - Invited interested people - Short introduction to Yammer- Producing good content on Yammer - Helpful training Getting people confident - Quite successful - Word of mouth sharing
	Interviewer: Did you invite people who know about Yammer?		
1	Research administration1: these people don't know anything about Yammer.	Not had a prior experience	Not had a prior experience
	Interviewer: No, I mean from the same department RSDO or from different departments?		
1	Research administration1: No, I put up notice and event notice on the internet, so it is a kind of general kind of invite for academic staff as well, professional and administration staff. So, anyone, who is interested was welcomed to come along to it.	Put up event notice- General invitation for all employees Academic staff - Professional and administration staff	Putting up event notices General invitation for all academic staff
	Interviewer: Do you think we need a kind of training again more?		
1	Research administration1: very much, Very much. Like a … a very similar sort of…. Very formal kind of environment... like people can ask a kind of questions… you know just come a long and say, "this platform is a completely new to me... can you explain to me what it is?" almost a good community to practise, how to navigate the tool well? I think it would be beneficial to have them running, More trainings	Very much (emphasizing) Beneficial training- more trainings needed	Emphasizing on more trainings

Appendix L: 19 Improving user engagement- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
Launched Yammer several years ago.	1	1
Ran a series of workshops	1	1
Invited interested people	1	1
Short introduction to Yammer	1	1
Producing good content on Yammer	1	1
Helpful training	1	1
Getting people confident	1	1
Quite successful	1	1
Word of mouth sharing	1	2
Invited people with no prior experience with Yammer	1	1
Putting up event notices	1	1
General invitation for all academic staff	1	1
Emphasizing on more trainings	1	2

Appendix L: 20 Improving user engagement- Identifying dominant codes

Cluster 11: Improving users' engagement
Ran a series of workshops (1)
Invited interested people (1)
Short introduction to Yammer (1)
Training for producing good content on Yammer (1)
Getting people confident (1)
Invited people with no prior experience with Yammer (1)
Putting up event notices for all staff (1)
General invitation for all academic staff (1)
Word of mouth sharing (2)

7. What kind of internal marketing campaigns, advertising, support groups etc. do we have for promoting Yammer at the universityl? (Marketing procedures required for promoting Yammer)

Appendix L: 21 Strategies & barriers- (initial coding & focused coding)

Strategies & barriers			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
2	Staff: my understanding to this question is that staff development is primary responsible for developing staff. you know, organising events, getting external and internal speakers, arranging events on whole manner of different types of staff development training need. And I have never seen Yammer as a part of their portfolio they are offering. So, I don't think that there is an official form of type of offering by university. If there is, it usually department base or whoever they administrate for this. It might be doing something small within their communities and those often go, I heard of… So, it is very difficult to trace where this training happening or what support? What kind of internal marketing campaigns are taking place? For instance, they might be many people who did not hear about what were offerings? Because it was not channel through the official staff development training courses. You know we just ran it upstairs, put event's pages or event teams, it wasn't official staff development training offering.	Staff development responsibility - Main duty - Organizing events - Getting external and internal speakers - Trainings needed- Not being their part of collection Not offered any support **(IF YES)** Small training - Internal communities Not formal announcement - No internal marketing - Not heard about training by all people- Not announced by staff development training courses. Not official staff development training offering	Staff development responsibility Organizing events Getting external and internal speakers Training staff Not offered any support by staff development Doing small training within their communities- Difficult to trace the trainings. Not formal announcement- No internal marketing Not official staff development training offering

Appendix L. 21 Strategies & barriers- (initial coding & focused coding) (cont.)

Strategies & barriers			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
	Interviewer: How can we make a strategy of using Enterprise Social network tools at university?		
2	**Staff:** I think the university needs to start that they want to use Yammer, because what happened? IS came from a part of office 365 one drive things, so it appeared, I think really Communication have not done anything about it, staff developments have not trained people. So, at the moment, we have just got other people who like it and people who tried to emerge themselves to support and no recognition of the effort they are doing. So, I think you need to have a combination and agreement by coming from staff development and few people see that we should start being using for internal purposes. We need to understand "Why we want to use it?" this is the first question we should start and get people to use Yammer. We need to understand how it works. We need to see the benefits that staff are getting it. It would be helpful if we have a target, so we can say like with a year's times, we have many active groups on Yammer or might have participation by several members… and we start to say "ok… we are going to find champions in the university and praise them or give them recognition as well for the job they are doing over above their normal job". I think a part of induction to the university by all managers, departments of the staff they give to all staff, they should start Yammer, this is how we communicate at the university. Also, I think you need to consider AGE things, so you might want to focus on some of education efforts more on certain age groups and some of your awareness and efforts more on the other age groups. Because people might come in and they know how to use it, but they do not know how these tools are and maybe she wants to know about audiences or audiences does not know how to use the platform? And if you show them how to use it, you need to follow up many sessions, you cannot have one training sessions, you need to have continued awareness about the platform. So, most of all it needs to be a reason to use Yammer, so I am not going to the platform to enjoying because it is new fresh and unique or only to meet new people, it needs to be s reason I am going there. So, with my own Team (PACMAN), I started to say my team that if you want me to read a content, put it on Yammer and take it away from email. Ha-ha… So, it is kind of training people that I want to choose from different things.	No training offered by staff development - Supported by small community - No recognition of the effort No reward - Requiring both engagement and agreement Staff development's push Motivating staff toward using Yammer – identifying the benefits- **Having a target** Establishing many active groups - Enhancing participation Finding champions in the university - Praising, recognition of the effort Extra input - Introducing Yammer in the induction to a staff - Considering the age of staff – training Putting more effort for certain age group- Educating consumptive users	No training offered by staff development - Supported by small community No recognition of the effort No reward Requiring staff development's push Identifying the benefits of using Yammer – having target Finding Champions in the university - Praising Introducing Yammer in the induction to all staff Putting more effort for certain age group Continuous awareness programs

Appendix L: 22 Strategies & barriers- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
Staff development responsibility	2	2
Organizing event	1	1
Getting external and internal speakers	1	1
Staff development training courses	2	2
Requiring both agreement and engagement to use Yammer	1	1
Requiring staff development's push	1	1
Making a clear purpose of using Yammer	1	2
Identifying the benefits of using Yammer	1	1
Having a target	1	1
Finding Champions in the university	1	1
Recognizing the extra effort	1	1
Praising	1	1
Introducing Yammer in the induction to all staff	1	1
Considering the age of staff	1	1
Putting more effort for certain age group	1	1
Continuous awareness programs (trainings)	1	1
No training offered by staff development	1	1
Supported by small community	1	1
No recognition of the effort	1	1
Starting to train my team workers	1	1

No reward	1	1

Appendix L: 23 Strategies & barriers- Identifying dominant codes

Cluster 11: improving users engagement Continues awareness trainings	**Cluster 10: lack of organizational and technical support**
Staff development responsibility and push (3) Organizing events (1) Getting external and internal speakers (1) Staff development training courses (2) Requiring both user's agreement and engagement to use Yammer (1) Making a clear purpose of using Yammer (2) Identifying the benefits of using Yammer (1) Having a target (1) Introducing Yammer in the induction to all staff (1) Continuous awareness programs (trainings) (1) Emphasizing on more trainings (2) Finding Champions in the university (1) Recognizing the extra effort (1) Praising (1)	No training offered by staff development (1) Supported by small community (1) No recognition of the effort (1) No reward (1)

8. What I have seen from the yammer posts, the users use Yammer as a notice board. What makes you continue to post on the Yammer even there is no replay on these posts? Do you receive any responses outside of the Yammer? (email)

Appendix L: 24 Resisting engagement on the platform- (Initial coding & focused coding)

Resisting engagement on the platform			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	**Research administration1 :** yes, you are right. It has been used more as a notice board. This is one of challenges of making better use of it. More training and support are needed and how to teach content to have more solicit over response. However, the reason why we do continue using it. Because colleagues get a lot from outside of Yammer corresponded. For instance, a person says, "I saw your funding opportunities, can I come in and see you about it?" or they tend to pick up a phone and calling us or emailing us, rather than putting on the Yammer.	Being agree Notice board - More training and support needed - Received many corresponds out-side of Yammer - Noticing the opportunity on the platform - Contacting via private channel- Telephone conversation - Emailing- Avoiding corresponding on Yammer	Notice board - More training and support- Producing good content- received many corresponds outside of Yammer- Contacting via private channel- Telephone conversation - Emailing Walk in- Avoiding corresponding on Yammer
	Interviewer: do you think why they avoid asking about the opportunity on Yammer?		
1	**Research administration1 :** I think the culture is dominant within RSDO. We have a strong underpinning culture of picking up the phone, walking in or emailing. So, Yammer is still relatively new in that chain or portfolio of tools. Maybe, I should say that pop in and ask question there. So, this work needs to be done I administrated one group and, but my colleagues administered other groups and they frontend on those conversation. They need training, they need to work on how they could try to get them responses on Yammer. **But there is success...** you know in the sense of … you know… we were running some events at the moments; I have had 7 to 8 people who said "I saw you (p2) on Yammer" think about what you are doing at the moment? Can I sign up for the event? So as far, these are great things.	A strong culture barrier - Underpinning organizational culture - Emailing Telephone conversation- Training needed for contributive users- Motivating users to correspond on Yammer- Succeeded in Yammer adoption- Being recognized on Yammer	Notice board - More training and support- Producing good content- received many corresponds outside of Yammer- Contacting via private channel- Telephone conversation - Emailing Walk in- Avoiding corresponding on Yammer

Appendix L. 24 Resisting engagement on the platform- (Initial coding & Focused coding) (cont.)

Resisting engagement on the platform			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
3	**Research administration 3:** So, to start with a lot of people reply out of Yammer by email or phone, and then I encouraged them why you are not putting on Yammer? They were very nervous and because it is often, they never post anything on yammer or any other social media tools. I can't believe it. So, I seat it for the first time, and I show them how to post on Yammer. It was sound scary for them. At the beginning at Yammer, we have many stupid things, "when you press end, you need to start a new line, you need to post it". So, people are just scared with posting for the first time, and I think once they get passed the first post, they are more like to engage in a game. But you do get a people who read a post with a contact you with variety of method. It is used to this method, it is used to email, it is culture. The more people start to use it, they become aware more. It will change.	Being nervous Never posting before Explaining them about posting on Yammer- Explaining them about posting on Yammer- Educating her own team Scary feeling- Initial stages- Stupid and simple instruction- Scared of posting- First time experience- Engaging in the game overtime. - Contacting via private channel (email, telephone, walk-in)- Being used to this method (audiences)- Being a culture	Being nervous Never posting before Explaining them about posting on Yammer- Explaining them about posting on Yammer- Educating her own team Scary feeling- Initial stages- Stupid and simple instruction- Scared of posting- First time experience- Engaging in the game overtime. - Contacting via private channel (email, telephone, walk-in)- Being used to this method

Appendix L: 25 Resisting engagement on the platform- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
Received many corresponds out-side of Yammer	1	1
Contacting via private channel	1	2
Contacting via Telephone conversation	1	4
Contacting via Emailing	2	2
Avoiding corresponding on Yammer	2	2
A strong culture barrier	2	3
Training my team	2	2
Working on users' engagement	1	1
Being Succeeded in Yammer adoption	1	1
Being a recognized face on Yammer	1	1
Being nervous	2	2
Never posting on Yammer	1	1
Educating simple instruction	1	1
Engaging in the game overtime.	1	1
Being used to traditional methods (email, telephone, walk-in)	1	1

Appendix L: 26 Resisting engagment on the platform- lack of organisational support- Identifying dominat codes

Cluster 8: Resisting engagement on the platform	**Cluster 9: diving behaviour.**	**Cluster 11: improving users' engagement**
Received many corresponds out-side of Yammer (1) Contacting via private channel (2) Telephone conversation (2) Emailing (2)	Being nervous (2) Avoiding corresponding on Yammer (2) A strong culture barrier (3) Being used to traditional methods (email, telephone, walk-in) (1)	Training my team (1) Educating simple instruction (1)

9. I had a look into Yammer posts, and I found that posts are too long and formal style to read. Do you think is it better if we have short posts and more informal contents?

Appendix L: 27 Information value - (initial coding & focused coding)

Low content quality or information value			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Research administration 1: it does matter, it all about attention span for groups when scrolling down home page. All of them have taken into consideration. All heading and announcements need to be bold and all of that are key to engage someone to read it. I think… That is why training around content adoption is key to success of it.	Being matter- Attention span *- Making bold all headings - The key for user engagement - Training for content adoption - Being a key for succeeding	Information value- Being matter Making bold all headings - A key for user engagement - Training for content adoption- Training is a succeeding factor
2	Staff: I think it has to be short and I think if you want to add information to the post. You need to add links to it and people go and find out more information by clicking on the link. But also, it has to be more casual and informal stuff rather would be with emails. And I am trying coach my team members about that, and I found it hard. Because they type everything in the email and I say to them "Ok, change this email… or…. Question". So, it will take time but hopefully after a while will be ok.	Short- Adding links in posts - Finding out more information via the link- Casual and informal contents - Training my own team members - Hard - Not putting all information in a post - Taking time for a change	Short post- Adding links in posts - Casual and informal contents - Work related material Training my own team members - Not putting all information in a post - Taking time for a change

Appendix L: 28 Information value- using sorting strategy to develop themes

Codes	Generality (out of 2 participants)	Frequency
Being matter	1	1
Making bold all headings	1	1
The key for user engagement	2	2
Training for content style	2	2
Short post	1	1
Adding links in posts	1	1
Casual and informal contents	1	1
Training my own team members	1	1
Not putting all information in a post	1	1
Taking time for a change	1	1

Appendix L: 29 Information value- Identifying dominant codes

Cluster 12: content value. Information value	Cluster 11: Improving user engagement
Making bold all headings (1) The key for user engagement (2) Short post (1) Adding links in posts (1) Casual and informal contents (1) Not putting all information in a post (1) Training for producing good content (2)	Taking time for a change (1) Training my own team members (1)

10. What kind of strategies would you use to promote Yammer at the university? (e.g., internal marketing campaigns, training for staff, technical support)

Appendix L: 30 Improving user engagement- (Initial coding & focused coding)

Improving user engagement			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Research administration 1: Copy people specifically to posts to get them to engage. Tagging them in the posts	Tagging them in the posts	Tagging them in the posts
2	Research administration 2: I am not sure that Yammer is the right platform to use. One thing that must change is that notifications suggest that I have subscribed to a social media commercial message and therefore it looks like spam.	Technical problem - going to junk email	Technical problem - going to junk email
3	Research administration 3: Make it more prominent; hard launch; leadership buy-in; clarify what it is and what is not; offer training.	publicizing - leadership - making a clear use of it	publicizing - hard launch- leadership - making a clear use of it
4	Research administration 4: Internal marketing campaigns, training for staff	Training staff- Internal marketing	Training staff- Internal marketing
5	Research administration 5: Internal marketing campaigns, training for staff	Setting different interest and subject groups	Setting different interest and subject groups
6	Academic staff: Various subject and interest groups set up.	Not noticed	Not noticed
7	Academic staff: Not much that i have noticed	Lack of official training	Lack of official training
8	Academic staff: Not much that i have noticed	Not noticed	Not noticed
9	Academic staff: I heard Yammer from my supervisor, I never received any email regarding training office 365 apps including Yammer. Everyone in the university use office 365. However, I have never seen any marketing or official training for office 365 or even Yammer. I believe that any new technology employs within the organization, it requires many training sessions for everyone need to know about the tool or even having some people (leaders) to help with launching the technology or help staff with it.	requiring many trainings sessions - leadership role- creating awareness environment	requiring many trainings sessions - leadership role- creating awareness environment

Appendix L: 31 Improving user engagment- using sorting strategy

Codes	Generality	Frequency
Tagging them in the posts	1	1
Official training for staff	4	4
Setting interest group on Yammer	2	2
Lack of official publicity	3	3
Leadership role	2	2

Appendix L: 32 Improving user engagement & lack of organisational support- identifying dominant codes

Cluster11: Improving the user engagement	**Cluster 10: lack of organisation support**
Tagging them in the posts (1) Official training for staff (4) Setting interest group on Yammer (2) Leadership role (2)	Lack of official publicity (3)

11. What is the reason that academic staff avoid replying under the posts? Is it related to the type of content you are sharing (e.g., research opportunities)?

Appendix L: 33 3 Barriers- (Initial coding & focused coding)

Key barriers			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Research administration: As long as we advertise opportunities then we are doing our job and we do get some take up of the information I also email outside of yammer and get responses Some do but not many - I really do not know they are probably too busy to interact	Being busy to interact on the platform - Receiving the responses out of the platform	Being busy to interact on the platform - Receiving the responses out of the platform
2	Research administration 2: I have only posted on Yammer a couple of times, responses, when made, were via email. N/A	Receiving the responses out of the platform	Receiving the responses out of the platform
3	Research administration 3: I rarely get replies so yes, it is being used as a notice board. My usage of Yammer has dropped over the last year because of a lack of engagement. I think it is the quality of announcements/posts on Yammer. The lack of questions in the original post doesn't invite a response. Blanket 'copying and pasting' large pieces of text is also a put off and doesn't encourage interaction and engagement.	Rarely got respond on the platform The lack of engagement - The quality of content - The lack of asking questions on the platform Putting a large text	Rarely got respond on the platform The lack of engagement - The quality of content - The lack of asking questions on the platform Putting a large text
4	Research administration 4: (email) I use it as a non-targeted way to disseminate information. It doesn't take much time and if even one additional person per post puts in an application for funding to a scheme I have advertised because they saw it on yammer then it is worth doing. There is no need for them to reply on the post, they can contact me by e-mail if they are interested in applying for funding.	Receiving the responses out of the platform	Receiving the responses out of the platform
5	Academic staff: Unawareness of what it does, time to access, lack of use	Lack of use- Lack of time- lack of knowledge	Lack of use- Lack of time- lack of knowledge

Appendix L. 33 Barriers - (Initial coding & focused coding) (cont.)

Key barriers			
No.	**Responses**	**Breaking the data up into its component parts or properties.**	**Crystallising the significance of the points (comparing data with data)**
1	Academic staff: The main one is that the notification email you receive from Yammer looks like junk mail, so it is easy to miss/ignore or delete accidently 2) You have to be very proactive to go find the group you wish to engage with 3) Not enough of my colleagues seem to use it.	The notification of Yammer sent to Junk email. - Easy to miss Ignoring accidentally - Lack of use - Not being active	The notification of Yammer sent to Junk email. - Easy to miss - Ignoring accidentally Lack of use - Not being active
2	Academic staff: **:** Time I suppose no other barriers-its a good tool for keeping abreast of social events hosted by groups of interest	Time to access- Setting some group interests	Time to access- Setting some group interests
3	Academic staff: Most people at university use Teams to communicate	Lack of use	Lack of use
4	Academic staff: Colleagues are reluctant to use yammer or have little to no information about the platform. The yammer usage is more common in some colleges but not all	Lack of use - Lack of knowledge Not used widely - Dominated by certain people	Lack of use - Lack of knowledge - Not used widely - Dominated by certain people
5	Academic staff: I think to be honest Yammer has not really pushed by the university/ so Yammer is never being really promoted as a collaborative tool by the university. I think if it had been promoted, people might use it more. It is never promoted. I use it because only for my research and I use Yammer in other universities, and I had an experience on how to use Yammer and then I start to use Yammer at the university.	Not publicized the platform - Not being promoted officially - Being familiar with Yammer - Used the platform before	Not publicized the platform - Not being promoted officially Being familiar with Yammer - Used the platform before
6	Academic staff: Lack of use, there are only certain people use Yammer in the university to find a call, workshops, or brokerage event. Lack of awareness – lack of time	Lack of use - Time to access Dominated by certain people Lack of awareness	Lack of use - Time to access Dominated by certain people Lack of awareness

Appendix L. 34 Barriers - using sorting strategy to develop themes

	Generality	**Frequency**
Being busy to interact on the platform	1	1
Resisting engagement on the platform	4	4
Doing our tasks on Yammer	1	1
Receiving the responses out of the platform	3	3
Low quality of content	1	1
Large bulk of information	1	1
Lack of use	7	7
Lack of knowledge about the platform	4	4
Lack of time	3	3
Being active	1	1
Easy to miss the notification	1	1
Setting some group interests	1	1
Dominated by certain people	2	2
Not being promoted officially	1	1

Appendix L: 34 Barriers- Identifying dominant codes

Cluster 13: key barriers to use Yammer	**Cluster 14: Low quality of content**	**Cluster 8: Resisting engagement on the platform**
Lack of use- emotional anxiety (7) Lack of time (3) loss of knowledge (4) Easy to miss the notification (junk mail) (1) Dominated by certain people (2) Not being promoted officially (1) Large bulk of information (1) Low quality of content (1)	Large bulk of information (1) Low quality of content (1)	Receiving the responses out of the platform (4)

Appendix M: Notes from Coder Two about the Focus Group Coding

First Round:
Here are some observations about the work and the knowledge I have of the project:

- In the conversations there are hints about a developing use for Yammer at the university (the pets group) and this mirrors a little the development of social groups at the second high ranking university (like knitting groups etc). My thoughts are that you need to reflect on the maturity of the groups (e.g. how long has each been active/how many people are signed up etc) as this development of new groups might be a sign of developing maturity. So actually, these two universities are on the same trajectory just separated by time/experience.

- I am not sure of what some of the theme's titles mean. E.g. 'Withdrawal users' behaviour on Yammer'. Check the titles and the meanings!

- I note that there is a tension between Yammer and Teams. Teams has more features and might allow people to develop relationships better because you can see and hear them, Yammer is only written word. Also, the university has a requirement to use Teams for student/staff interactions and this means that there is institutional pressure to use Teams, not so for Yammer. This is relevant to theme 3 I guess and theme 4 by implication.

- If your thesis is about Yammer explicitly, then OK, but if it is about social networking systems, then you need probably to identify Teams as such a package and examine this? For example, because of the sight and sound aspects of Teams, maybe Teams influences/address's themes 1, 3, 5, 12, 14?

- Be careful not to write this around Yammer (unless this is the title), but around social systems, of which Yammer is an example. So maybe your conclusions need to be about the use of social media and a critique is that it is exemplified by the use of Yammer with a late new one appearing (Teams) as a comparator.

- Maybe there is another comparison here which is to use the feedback from the Yammer analysis to generate the essential features necessary to make a social network system useful in this context. Then weaknesses of Yammer can still be used to generate a 'specification'.

- I think that the themes that you have arrived at are OK given the thin data you have. As I said above you need to critique this work and recognise the difficulty of getting data. This assumes that I understand the theme title…..see above comment on one of them…..I think you should probably have a definitions page somewhere that described what the titles actually mean.

Here are few detail comments:

1.3 privacy seems an odd theme for a social network system!

Re 1. At the first university there is a limited amount of knowledge sharing…..it is mainly one way, i.e. knowledge dissemination!

3.1 Define what culture means here: is it literal (ie different nationalities/different cultures) or figurative (different people have a different approach to chatting on line etc).

3.2 explain 'facilitating conditions' (maybe using the page of definitions I suggested) relevant to 4.1 too.

7 is very focussed on Yammer not social systems. OK but maybe keep the separation

8.1 what is the difference here and 3.2? 8.2 like above 3.1

9.2 should be team's capability/functionality too

1 and 12 look very similar

Appendix M: 1 Developed themes- First round (coder 2) - Draft

Major Category	Category/Themes	Focused Coding	Connotation
Outcome	**Benefits**	Developing a common ground	Informal communication, conversation, interactive tool.
		Building a person perception	Getting to know somebody online and meet them in person.
		Knowledge sharing timely	Sharing ideas, getting feedback, sharing experiences, giving assignments.
		Building a friendship	Social interaction, meet new people, networking,
		Open Calls	Looking for an academic position, collaborating for research projects.
	Fatigue behaviour	Diving behaviour	Fearing putting opinions, being nervous, having no experience, working environment, worrying about expressing ideas, and low engagement.
Barriers	**Figurative culture**	Having a different approach to chatting online, coming in person, a notice board, getting a lot from outside of Yammer corresponded, a strong underpinning culture of picking up the phone, walking in or emailing, and being comfortable with their habits.	
	Low facilitating condition	No support received from marketing communication, independent training, Short presentation, small group training, internal event notice, invited interested people, training for producing content, Word of mouth sharing, invited people with no prior experience.	
Motivators	**Core values**	Feature values	Being a supplement tool, seen by, social tagging, searching stuff by using Hashtag, tracing audiences, accessing the group insights, analytics graphs, seeing the behind scene, storing and sharing files, doing polls, different virtual background.
		Content style	Making bold announcements, keeping short, adding links to it.
	Tension between Yammer and Teams?!1! or developing a use for Teams and Yammer ?!1!!	Yammer Functionality	Becoming internal communication channel, collaboration between different departments, using only for staff and students, less non-work related, social interaction
		Teams Functionality	Outside collaboration, collaborating with your department, collaborating with whole university, working on projects with Teams, doing big web conferencing, webinars, storing and sharing files, work-related tool.
Strategies	**Facilitating Conditions**	Staff-development programme- training	Organizing events, getting internal and external speakers, official events for academic staff continued awareness training.
		Top-down management support	Managers support senior leaders' support. Lots of training, making a clear purpose of using ESN tools, having a target, IS support.
		Content value	Keeping post short, work-related posts, content creation, content adoption training.
		Student's influence on academic staff uses behaviour (Mentoring by students)	A reverse mentoring, giving training to staff by students,
		Praising	find champions in the university and praising, recognition of the effort
		The age matter	Putting more effort for a certain age, providing more awareness.

Definitions:

Diving Behaviour means that users reduce their social participation to only browsing and checking of relevant messages without making responses or with reluctance in expressing their personal opinions or views in public due to their higher degree of concerns for their own values and privacy (Zhang et al., 2020).

Figurative Culture Different people have a different approach to chatting on line etc

Facilitating Conditions refer to "the degree to which individual believes that an organizational and technical infrastructure exists to support the use of the technology" (Venkatesh et al. 2003).

Feature Value refers as the degree to which the features in a network provide benefits for the individual.

Content Value: The value and sustainability of a social network are undoubtedly reliant on the quality of content created from the communication activities (Kane et al. 2014). Chin et al. (2015c) revealed that the characteristics of the content such as its relevancy to work, age (i.e. current) and communication style influence the enterprise social network use. More and diverse contributors on a network may also increase the quality of generated content (e.g. reduce the redundancy) or may complicate matters (e.g. information overload) (Kane and Ransbotham 2012).

Appendix N: Notes from Coder Two about the Focus Group Coding (Draft 2)

Second Round
A few comments about your latest draft ideas:

I suggest that the right most column is 'connotation examples' as I don't think you should be prescriptive here. Regarding the yellow highlighted comment: tension between the two platforms (and this really means confusion etc) can be regarded as both a motivator and a barrier really! A motivator to use one system or another depending on the use it is known for, and a barrier to NOT use the OTHER system for the same reason! So maybe approach this differently. At the university, I suspect that Teams, since it is the University wide accepted system for delivery of the University products and services, will be the system used for all formal communication and some informal (i.e., face to face chats) because it has everyone on it and has directories, calendars etc. So, it is required to use it, so it is forcing people to learn it and then they find other uses. Yammer is informally structured, does not have access to the same institutional pressure and contact data and will only attract people who are seeking something more casual. The Motivator to use Teams here is the institutional pressure for delivering services….and actually is a social system adopted and pressed by management, so it will get traction……. the barrier to use Yammer is the LACK of this pressure (apart from other feature specific aspects like ability to use video etc). The motivator to use Yammer is its ease of use and informal nature that is quick to use (especially for informal short messaging) …..Teams is not as easy to use for quick brief written messages. It is a pity to use the specific names of the products in this category since the rest of your table does not mention the platform, so maybe you should find a descriptor for the platforms that summarise the strategy of their use. In Teams case it is an institutional tool, in Yammers case it is a tool selected for use at a personal level…..Teams has 'top down management support' re your focussed coding column. Actually it is more than this, it is top down management pressure! This top-down management support/pressure will actually prevent teams being used for some of the activities that Yammer is used for at the second university……there will not be much management support for the use of Teams as a system to set up knitting groups! So my thought I suppose is that the motivator is the 'Institutional demand' for the use of a system and the Barrier is the 'Visibility of messaging' for a system that is imposed by the institution…. I mean here that people will not use a system for social messaging if it is visible to 'management'.

Appendix O: Reliability Test- First Round & Second Round (Focus Group)

Appendix O: 1 Coefficient reliability first round

Coder 1			Response	Response		Coder 2		
Outcomes	Bnefits	Developing common ground	7	7	1	Developing common ground	Benefits	Outcomes
		Building person perception	5	5	1	Building person perception		
		Knowledge sharing	5	5	1	Knowledge sharing		
		Building a friendship	30	30	1	Building a friendship		
		Open calls	12	12	1	Open calls		
	Fatigue behaviour	Diving behaviour	16	0	0	----------	Disbenefits	
Barriers	Resisting engagement on the platform		27	24	0	Figurative culture		Barriers
	Low facilitating conditions		15	**15**	**1**	**The lack of organizational pressure**		
	loss of knowledge		4	4	1	loss of knowledge		
	Low content quality		2	2	1	Low content quality		
	lack of time		3	3	1	Lack of time		
	emotional anxiaty		11	11	1	Emotional anxiaty		
Motivators	Feature value		29	29	1	Feature value		Motivators.
	Information value		9	9	1	Information value		
	Organizational requirement		1	1	1	Organizational requirement		
	Adequate organizational and technical support		10	10	1	Adequate organizational and technical support		
Strategies	Improving user engageement		53	53	1	Improving user engageement		Strategies

Match	15
Total	17
IRR	88,24 %

Appendix O: 2 Coefficient reliability second round

Coder 1			Response	Response		Coder 2		
Outcomes	Bnefits	Developing common ground	7	7	1	Developing common ground	Benefits	Outcomes
		Building person perception	5	5	1	Building person perception		
		Knowledge sharing	5	5	1	Knowledge sharing		
		Building a friendship	30	30	1	Building a friendship		
		Open calls	12	12	1	Open calls		
	Fatigue behaviour	Diving behaviour	16	16	1	Diving behaviour	Disbenefits	
Barriers	Resisting engagement on the platform		27	24	0	Resisting engagement on the platform		Barriers
	The lack of organizational pressure		15	**15**	**1**	**The lack of organizational pressure**		
	loss of knowledge		4	4	1	loss of knowledge		
	Low content quality		2	2	1	Low content quality		
	lack of time		3	3	1	Lack of time		
	emotional anxiaty		11	11	1	Emotional anxiaty		
Motivators	Feature value		29	29	1	Feature value		Motivators.
	Information value		9	9	1	Information value		
	Organizational requirement		1	1	1	Organizational requirement		
	Adequate organizational and technical support		10	10	1	Adequate organizational and technical support		
Strategies	Improving user engageement		53	53	1	Improving user engageement		Strategies

Match	16
Total	17
IRR	94,12 %