A STUDY EXPLORING THE EFFECTIVENESS OF A VIRTUAL COACH TO UPSKILL UNDERSERVED WOMEN

P. Otermans, D. Aditya

Otermans Institute, Brunel University London (UNITED KINGDOM)

Abstract

The use of learning chatbots has increased over the past decades, impacting the education of individuals across the globe as a virtual teaching coach. This study will increase our understanding of the significance of these chatbots in education enabling us to understand how it could heavily benefit individuals universally. To aid and assist underserved women globally, allowing them to achieve their goals on the platform using a conversational agent as a coaching tool. This study focuses on underserved women in South Africa, a sizeable user group with whom such a coaching tool has not been tested previously. Two methods were undertaken: (1) use of online surveys and (2) focus groups. Eighty-eight participants took part in an online survey to measure and evaluate how they perceived the Virtual Coach post-interaction with the learning chatbot. Secondly, 19 female participants took part in online focus groups to discuss and express their views post-interaction with the Virtual Coach. The data were analysed using thematic analysis. The survey results showed that participants were very positive about their interactions with the Virtual Coach and found it very useful, beneficial, engaging, and they now know what to learn next in their career journey. From the seven generated themes, it is clear that participants found the Virtual Coach friendly and trustworthy, they enjoyed interacting with the bot, and finding the guidance helpful as well as the support to navigate around the website. Participants also provided feedback to improve the Virtual Coach further. The Virtual Coach was highly perceived in a positive light by participants where many concluded they would be more inclined to use it again, suggesting the Virtual Coach's positive impact on aiding individuals.

Keywords: Artificial intelligence, chatbot, EdTech, teaching, lifelong learning, SDG 4, SDG7.

1 INTRODUCTION

1.1 Online Education in General

Technology has become increasingly popular over the last few decades amongst populations across the globe as it has advanced through the use of computers and such multi-functional devices. This has heavily intertwined and impacted the education sector, allowing access to online materials and courses to individuals globally. Research on online education and tools has shown students' immense preference for online learning and its visual interactions and layouts [1, 2]. This is reinforced by [3] who found students to report higher levels of satisfaction and interest in content of courses offered in a virtual classroom, when presented with an appropriate educator for the students' needs. Though it is heavily stressed that online learning is highly dependent on individuals' ability on using technology [3], the younger generations have not been found to fall victim to these issues growing up in the digital age, in comparison to the older generations [4]. The dominance of technology in online education and learning has resulted in financial benefits for both institutions and students with access to materials at lowered long-term costs [2]. This not only allows individuals to engage from the privacy of their own homes but also extends to individuals within developing countries, allowing them access to learning using technology. [5] research into cross-cultural perspectives suggests the globalisation of online learning allowing students from different backgrounds to enrol in courses outside their native countries emphasising the accessibility improvement technology has brought on education and fundamentally transcending barriers. In addition, one of the crucial impacts of online access in education has come from online forums, which allow students to connect with other students and teachers, alike. These have also greatly improved the way students access support and help when needed to understand materials [1]). However, due to limited office hours with in-person assistance, chatbots' assistance is found to be a beneficial aspect of online learning [6] with minimised delays, being more intelligible to online forums ran by institutions.

1.2 Learning Chatbot as a Tool in Education

Learning chatbots have become increasingly embedded in the communication and learning of individuals, especially in the education sector by acting as virtual teaching assistants. Chatbots have helped respond to and aid student queries with their online learning [7] through simulated conversations, mimicking humans. The chatbots acting as "pedagogical agent(s)" [8, p. 528], allow students to experience the same interactions they would with their educators [9]. Chatbots can enrich user interactions through additional support of answering potential queries and problems at any time allowing trust to be built as a conversational partner with the students, enhancing their learning experience [9]. [8] state this to be an extremely convenient aspect of the chatbot as it significantly increases the speed at which students receive assistance with regards to their education. Speed as a factor, is discussed by [10], where they found chatbots to be the solution to the individual problems students face. To support students faster, they found that one educator addressing multiple individuals would simply lead to excess time consumption. [8] continued to add that the chatbot can similarly aid these educators, updating necessary text information (which student queries could be based on), without them having to do so manually, additionally saving time. Though there is considerable research into the field of chatbots in education, [11] state that we are still in the "early stage(s)", thus cannot fully comprehend the extent to which learning is effective with chatbots. In addition, a reoccurring issue faced by students using chatbots was the possibility of privacy issues with regards to their data. Regardless, 48.9% of Indian students in Higher Education did reach out to their educational chatbot as their "quickest communicational channel" [12, p. 5] reinforcing the benefits of such technology to be further integrated into the educational sector. Recent research presents the revolutionary effect of chatbots in global virtual education, with their ability to accommodate each individual and their learning needs [13] in a personalised manner. This continues to motivate research, including this study. The aim of the Virtual Coach chatbot is to help underserved women globally and to achieve their goals on the platform, particularly focusing here on underserved women in South Africa which has not been done before. We have integrated a novel coaching tool that helps them understand their career personality to potential careers that could interest them, personally, by providing them information. Additionally, the courses aim to upskill them to reach that goal. To test this, the Virtual Coach user testing was conducted.

2 METHODOLOGY

This study was a user testability study and consisted of a survey and a focus group. Participants who took part in the focus group also completed the survey.

2.1 Part 1 - Survey

Participants. In total 88 participants completed the survey, of which 19 also took part in the focus groups. The majority of participants (46.6%, N = 41) were between the age of 18-24 years old, 34.1% (N = 30) of participants were between 25 and 34 years of age, and 19.3% (N = 17) participants were between 35-44 years old.

Materials. Participants were asked to complete an online survey using Google Forms consisting of six sections to measure and evaluate how they perceived the Virtual Coach.

Demographics. Participants were asked about their age.

System Usability Scale. The system usability scale (SUS) was used to assess how 'usable' the Virtual Coach was [14]. Usability of the Virtual Coach can be described as how easy to use and understand the participant perceives the Virtual Coach. The SUS is a 10-item questionnaire using a 5-point Likert type-scale for each item that ranges from (1) "Strongly disagree" to (5) "Strongly agree". This scale is commonly used to assess the usability of a range of systems. A high value produced by ratings suggests that the system is usable. The benchmark for an unusable system is below 68 and a rating below 50 is cause for concern [15].

Competence and Warmth Scales. Participants were asked about the competence and warmth of the Virtual Coach. The Competence and Warmth scale (CSW) [16] was used to investigate whether the participants thought that the conversational AI virtual trainer was both competent and warm. The competence and warmth scale contains 9 items where 5 items measure competence (competent, confident, independent, competitive and intelligent) and 4 items measure warmth (tolerant, warm, good natured and sincere). The higher the score, the higher the rated competence (ranging from 5 to 25) or warmth (ranging from 4 to 20). All items were rated on a 5-point Likert scale ranging from (1) "Not at all"

to (5) “Extremely”. Results of a reliability analysis indicated that both the competence and the warmth scale were internally consistent (Cronbach’s α = .85, Cronbach’s α = .80 respectively).

Social Attractiveness and Trustworthiness. Participants also rated the Virtual Coach on its Social Attractiveness and Trustworthiness. The Social Attractiveness and Trustworthiness scale (SATS) [17] was used to measure the participants perception of the Virtual Coach’s social attractiveness and trustworthiness. The scale is comprised of 6 items 4 of which relate to Social Attractiveness (Likeable, Sociable, Pleasant and Friendly) and 2 of which relate to Trustworthiness (Trustworthy and Reliable), all rated on a 10-point Likert scale ranging from (1) “Describes very poorly” to (10) “Describes very well”. The higher the score the higher the rated social attractiveness (ranging from 4 to 40) or trustworthiness (ranging from 2 to 20). Results of a reliability analysis indicated that both the social attractiveness and the trustworthy scale were internally consistent (Cronbach’s α = .93, Cronbach’s α = .93 respectively).

Social Presence Measure. The Social Presence Measure (SPM) was used to investigate how users perceived the Virtual Coach’s social presence following an interaction [18]. The scale is comprised of 5 items, each rated on a 5-point Likert scale ranging from (1) “Not at all” to (5) “Very strong”. In this scale, one statement “I felt that the trainer was very detached in her interaction with me” is negatively loaded and therefore had to be reversed coded. The higher the score the higher the rated social presence (ranging from 5 to 25). Results of a reliability analysis indicated that the social presence scale was internally consistent (Cronbach’s α = .60).

Other questions. Participants were asked to rate the following 5 items on a 5-point Likert-type scale for each item that ranges from (1) “Strongly disagree” to (5) “Strongly agree”. ‘I would visit the website more often due to the Virtual Coach.’; ‘I liked engaging with the Virtual Coach.’; ‘Engaging with the Virtual Coach was useful’; ‘The interaction/responses from the Virtual Coach were beneficial.’; ‘Due to the interaction with the Virtual Coach I am now more confident in choosing/deciding what to learn’.

Additional questions were asked to evaluate the usability of the Virtual Coach: a) To what extent do you think the Virtual Coach is understandable from your perspective? This was rated on a 5-point Likert-type scale ranging from (1) “very difficult to understand” to (5) “very easy to understand”. b) How easy do you think it might be to use the Virtual Coach in the future? This was rated on a 5-point Likert-type scale ranging from (1) “very difficult to use” to (5) “very easy to use”. c) How likely are you to use this Virtual Coach in the future? This was rated on a 5-point Likert-type scale ranging from (1) “very unlikely to use” to (5) “very likely to use”. d) Considering your experience with the Virtual Coach so far, how likely are you to recommend this to a friend or colleague? This was rated on a 10-point Likert-type scale ranging from (1) “not likely” to (5) “very likely”.

Procedure. Ethics approval to conduct the study was received from the institution (Ref: 001-JUNE2021). Participants were recruited via social media which included a link to Google Forms which contained a participant information sheet and were asked to provide consent before continuing with the survey. Participants filled in the questionnaires in the following order: demographics; the SUS scale; additional comments about the website; other questions; CWS scale; SATS scale; and SPM scale. Then participants were thanked for their participation in the study. abstract.

2.2 Part 2 – Focus groups

Participants. Nineteen female participants took part in the focus groups and were recruited using opportunistic sampling.

Data collection method. Data was collected using online focus group to encourage participants to express their views and opinions about the Virtual Coach and to facilitate a discussion amongst the participants on their experience with the Virtual Coach. Online focus groups also provide the opportunity for the researcher to ask follow-up questions and for clarification where needed. The focus groups were conducted online via Zoom. Focus group 1 included 5 participants and lasted 37:28 minutes, focus group 2 had 3 participants and took 28:46 minutes, the duration of focus group 3 was 38:42 minutes with 6 participants, and finally focus group 4 had 5 participants and lasted 40:33 minutes.

Data analysis method. The focus groups were transcribed and analysed using thematic analysis due to its flexibility for analysing datasets [46]. Transcripts were thoroughly read, coded with the research question in mind, and themes were generated via an iterative process. Using thematic analysis, seven themes including sub-themes were generated.

Procedure. Ethics approval to conduct the study was received from the institution (Ref: 001-JUNE2021). Prior to the focus group, the participant information sheet and the informed consent form had been

emailed to the participants to read, sign and email back. All participants agreed to take part in the focus group. Each focus group started by welcoming the participants, and by re-iterating the purpose of the study and re-confirming their consent to take part, after which the recording started. Each participant briefly introduced themselves, after which the researcher introduced the structure of the focus group. First, participants would individually engage and interact with the Virtual Coach – this took approximately 10-15 minutes. After this, participants were asked to complete the short online survey (see part 1) which took approximately 5-7 minutes. The remaining time was used to conduct the actual focus group (i.e. the discussion amongst participants) about their experience with the Virtual Coach. At the end of the focus group, participants were debriefed. Participants received no compensation for their participation.

3 RESULTS

Results revealed some concerns over the usability of the Virtual Coach. The participants in this user testability study found that the Virtual Coach was below benchmark, set at 68, for the usability of a program. The mean score was 65.8 with a standard deviation of 16.1. In more detail, 39.8 % of participants (N = 35) had a SUS score higher than 68 which is considered above average (figure 1). However, the users found the Virtual Coach to be competent (M = 21.1 ± 3.6), warm (M = 17.0 ± 2.9), have a sense of social presence when interacting with the Virtual Coach (M = 18.8 ± 3.8) and found the Virtual Coach to be trustworthy (M = 17.2 ± 3.5) and having a high rating of social attractiveness (M = 34.7 ± 6.3).

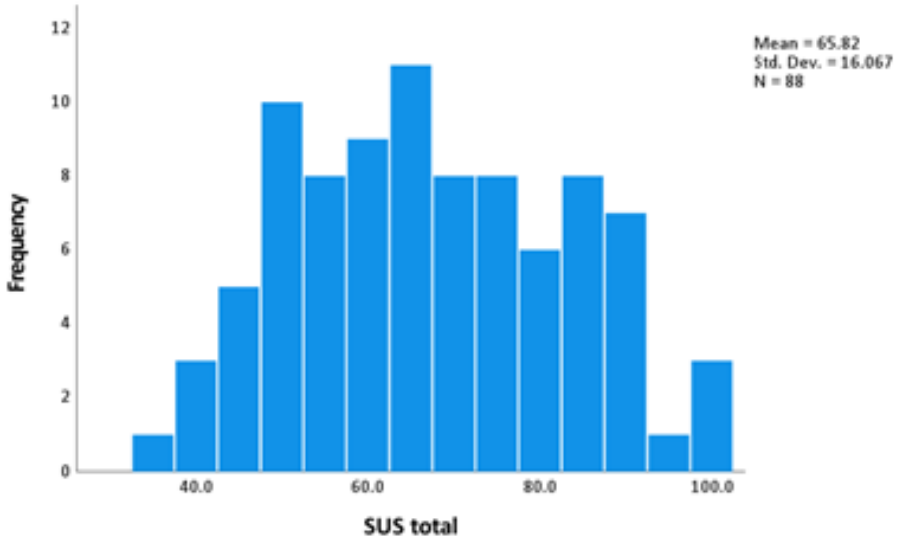

Figure 1. Histogram showing the distribution of the SUS total score of participants.

When asked about their experience with the Virtual Coach on the website, most participants reported having had a positive experience with the Virtual Coach. In more detail, 64.8% of participants would visit the website more often due to the Virtual Coach indicating that the Virtual Coach is a highly beneficial addition to the website driving user engagement, user interactions and user visits. Furthermore, 72.7% of participants liked engaging with the Virtual Coach suggesting that participants had an enjoyable experience. In addition, 81.8% of participants found engaging with the Virtual Coach useful indicating that the Virtual Coach was valuable and that participants understood how to engage with it. Moreover, 84.1% of participants found that the interactions/responses from the Virtual Coach were beneficial suggesting the positive impact the Virtual Coach has on participants and their learning journey. Finally, and most importantly for the participants' learning journey, 72.7% of participants indicated that due to their interaction with the Virtual Coach, they now feel more confident in choosing or deciding what to learn. This suggests that the interactions with the Virtual Coach are not only useful for participants, but boost their confidence which could lead to an increase in engagement with the other online content. This was further confirmed by the following results: 86.4% of participants thought the Virtual Coach is (very) understandable from their perspective, 97.7% said that they find it (very) easy to use the Virtual Coach in the future, and 80.7% indicated that they are (very) likely to use this Virtual Coach in the future. The majority of participants (88.6%) would recommend the Virtual Coach to their friends and/or colleagues indicating that the Virtual Coach is helpful and beneficial to participants. To sum up,

participants were very positive about their interactions with the Virtual Coach and found it very useful, beneficial, engaging, and they now know what to learn next in their career journey.

3.1 Focus groups

Seven themes were generated: 'Purpose of Chatbot', 'General Thoughts on Experience', 'Interactions with AI Chatbot', 'Options Provided by AI Chatbot', 'Content', 'Money' and 'Technical Aspects'.

3.2 Purpose of Chatbot

This theme focuses on the participants' views on the purpose of the Virtual Coach whilst interacting on the website. Multiple participants felt that the purpose of the Virtual Coach was to navigate them quickly through the website where P1 stated the Virtual Coach was to "help people navigate through the website better… a quick navigation tool" (P1, l. 10-12) which was reinforced by P2 saying "a quicker way navigating someone towards, in the right direction where they need to be on the website" (P2, l. 35-37). In addition, two participants mentioned that the Virtual Coach was a "useful starting point" (P6, l. 35-37) and that they "would utilise it more in the beginning" (P8, l. 131-132) concluding the purpose of the chatbot was to help give them some "guidance" (P9, l. 40), and a sense of direction, making it "super straightforward" (P9, l. 43) to use the website. Another purpose participants gathered from the interactions with the Virtual Coach was its helpfulness by being condensed and accessible for all. Participants stated the purpose of the chatbot as "to facilitate…the system automatically takes…based on what you write" (P7, l. 21), "AI condenses it for everyone" (P3, l. 7-8), and "kind of narrowed down my search and gave me recommendations" (P8, l. 37-38). Such participants felt the idea of this chatbot was to aid individuals on the website to prevent feeling "overwhelmed" (P6, l. 46), and instead be a "bit more useful" (P7, l. 22-23). On the other hand, some participants did not find the Virtual Coach as useful when guiding them through the website. Some individuals mentioned that they "personally…didn't really find the need for the AI" (P7, l. 27) and "the bot would be a bit useless for people who know what they're searching for" (P12, l. 33-34), which could imply that the bot could still be helpful for those that require more navigation aids when on a website. P13 highlighted a different aspect in relation to the purpose of the bot when they said "I think it assumes that the user…. has knowledge of what the website is about…I think there's a lot of implied knowledge…a bit too much" (P13, l. 51-63). This idea was very similar to P16's comment that the Virtual Coach should "actually suggest different options…rather than being very general" (P16, l. 635-638), with regards to its purpose to help.

A large majority of the participants reacted positively to the purpose of the Virtual Coach to aid and navigate their experience on the website which was also found by [20]. In their research into usage of AI-powered chatbots for the use of tourism and hospitality purposes, they found their chatbots as useful and easy to use even to those that may be less technologically inclined, making it accessible for all newcomers on the website. The idea of navigation is further supported by [21, p498] who found that their AI chatbot on a college website seemed to "help the users find the required information in a few clicks" referring to the process of leading, guiding and navigating individuals. In addition [6] also stated the AI agent to be "easily locating information related to [visitors'] queries" [6 p. 1], reinforcing the AI's purpose to aid individuals through the site as also stated by multiple participants. In addition to navigation, P6 and P8 did also mention the usefulness of the Virtual Coach in the beginning which is reinforced by [22] who found their AI chatbots to gather information to understand the users' responses and their input statements to offer them what they were looking for. This is similar to [23] findings of AI chatbots' purposes to aid humans with minimal "text entry effort and providing relevant knowledge" [23, Abstract] which supports P3 and P8's comments on condensing and narrowing their overall search through the website.

Contrary to the statements on the Virtual Coach as a tool for navigation, P7 and P12's opinions on the Virtual Coach as not so useful are echoed by [23] study which showed that responses offered by the chatbot did not always aid the quality of the user's response, showing their overall lack of engagement with the AI to follow through onto the site. [23] continued that the lack of engagement from users resulted in "lower-quality answers" than of that in a real-life setting [23, Abstract]. Furthermore, it was found that individuals' interactions with the AI were less compliant to the requests made by the bot stressing P12's opinion on the AI chatbot as unnecessary for individuals who require no assistance when navigating the site [24]. Even though users were found noncompliant to the interaction with the AI, [25] and [26] found interaction between users and the chatbot to be effective when it was able to "handle most conversations" [26, p. 6] reinforcing the AI's ability, having been programmed to aid and provide information based on user input.

3.3 General Thoughts on Experience

This theme encompasses the participants' opinions on their positive and negative experiences whilst interacting with the Virtual Coach. Where some participants found the Virtual Coach an enjoyable experience on the website, others found the experience to be lacking in universality. Many participants expressed their overall experience on the website as enjoyable where P12 found the Virtual Coach to be "very personal and engaging" (P12, l. 217), P13 adding they had "an enjoyable experience" (P13, l. 336-337) as well as P15 stating that the website was "very nice to use… [being a] pleasant experience" (P15, l. 593-594). In addition, P17 said that they thought "it was just great [where they were] trying to think of something negative to say for it but…can't (P17, l. 119-120), showing their experience on the website to be without issues. Contrary to this, other participants expressed their concerns for the lack of similar experience of the website for all, where they did not have the same experiences as their fellow participants. This is evident where P3 directly stated that "I think it's just its - just giving every single person… a different experience" (P3, l. 124-125), which was reinforced by P1's statement "I think at the beginning it's because we had such different experiences…it can really …put people off" (P1, l. 546-549), showing the lack of universal experience for all which can be perceived negatively.

Similarly, to P13 and P15's "enjoyable" and "pleasant "experience, research into user experiences with chatbots in the customer service field found that a positive experience is maintained amongst participants as long as it is clear where the individuals are being taken through the website, when navigating through it, [27] which was seen as a large purpose of the Virtual Coach from our participants. [28] study adds to this positive experience. Their study consisted of millennials completing self-administered questionnaires on the usefulness of AI chatbot experience and results showed that there was an increased ease of use and overall usefulness which correlated with greater overall customer experience. This shows that individual's experience is heavily determined by their desired outcome. Furthermore, [29] study on a chatbot questionnaire in comparison to a regular computer questionnaire found that participants remained more attentive when completing the chatbot questionnaire, which strengthens P12's opinion of greater engagement with the Virtual Coach. In addition, it was found by [30] in a questionnaire that negative experiences were mainly due to practical issues involving the chatbot, when they (AI) could not understand and assist individuals. This strengthens [28] findings that individuals' perceived usefulness highly predicted experience and the significance of pragmatic attributes in a user's experience. However, some participants did state their concern for the lack of universality in the overall experience, which [30] subtly touched upon in their study. With regard to this lack of universality, [30] did find age differences to have an effect on experience, where older participants were especially affected by such practical issues involving user efficiency when compared to younger users and their experiences. Considering these findings, it can be concluded that though individuals may have had a positive experience, their age and previous technical experience could have been a high contributing factor to their overall experience with the Virtual Coach.

3.4 Interactions with AI Chatbot

This third theme focuses on the participants' overall communication with the Virtual Coach and how conversational they felt the interaction was. This theme is divided into two subthemes of "Human Aspect of AI Chatbot" and "Robotic Aspect of AI Chatbot". Delving into the subtheme of "Human Aspect of AI Chatbot", participants felt there were certain aspects of the Virtual Coach that resembled the positives of a human interaction. P2 described the Virtual Coach as "quite friendly" since it told them "jokes" (P2, l. 138) which P4 added to as they felt the Virtual Coach was "trying to get to know [them] on a personal level" (P4, l. 546-143) which reinforced a strong human resemblance to the AI. P5 continued that it was "trying [to] understand the person I am…to give a response that's more catered to me so I like that…personal effect" (P5, l. 267-268), later also adding that "the joke … was funny" (P5, l. 271), saying "it's something a human would say" (P5, l. 287) when referring to one of the bot's responses. In addition, P16 felt that it was more personalised when the Virtual Coach "asked for [their] name…showing more care and attention" (P16, l. 546-549), just as a human would, reinforcing the bot's ability to mimic human behaviour allowing the participants' experiences to be enhanced.

Even though participants felt there were human-like aspects with the Virtual Coach, there were certain aspects that were more robotic in nature when interacting with the chatbot on the website. This is addressed through the second subtheme of "Robotic Aspect of AI Chatbot". For example, participants expressed broken communication with the bot where "there was a barrier where we lost communication" (P5, l. 190), and "I just directly got "What's your name?" and then…the conversation" (P3, l. 395-396) suggest a forced nature of conversation where it was very inhuman-like - to which P2 agreed "I got this like three, four times" (P2, l. 401). P3 who stressed the robotic nature of the AI - "there still needs to be

this humanistic element where it's…not a scripted type of conversation but more an easy go…convo" (P3, l. 520-523) - who clearly felt the conversations were unnatural and lacked humanity. As expressed by multiple participants, the humanity of the Virtual Coach does remain an important factor when interacting with bots online. This is confirmed by [31] who found that users had more trust in their chatbot when affability and empathy were detected by users from the bot. P2's view on bot friendliness and P16's comment on the bot's attention are consistent with this. In their survey on consumer trust of AI, it was established that users' reliance increased with perceived trust [31]. This is clear in P5's comment above on personal and personalised responses from the bot. [19] research on the role of a chatbot stresses the importance of the human aspect of the chatbot mentioned by P4 and P16, as it marks personality of the chatbots as significant. Multiple comments on humour-enhanced participants' experience showed that having such positive playful interactions allowed a less rigid engagement with individuals and allowed the continuation of responsive conversation.

Though there were human aspects of the Virtual Coach, other participants did identify robotic features of the Virtual Coach, limiting their interactive experience. In a study by [32, p. 70], many university students felt the chatbot was more of a "novelty" instead of the educational tool that it was. A large number of students reported that the AI lacked interaction when using it as a conversation partner in comparison to a human conversation partner, to which they continued to state that the AI lacked emotion as well as its "inability to confirm understanding" [32, p. 76]. P2's comment is in accordance with this. Furthermore, [33] stated that even developed chatbots are restricted in some respects concerning organic human conversation, consistent with P3's experience on the forced and scripted nature of the chatbot's conversation. This lack of real dialogue underpins individuals' negative opinions with regards to the lack of humanity of AI. The mixed positive and negative experiences of participants with regard to their interactions seem to differ considerably based on their exact conversations with the Virtual Coach and the capability of the bot. This is clearly an issue that is important for future AI development to consider. The experience from the focus groups indicate a lack of universality and therefore not a uniform experience for all users, which impacted users' experience.

3.5 Options Provided by AI Chatbot

This theme explored the different selections and options given by the Virtual Coach to navigate the website to find the content participants were looking for. Many participants expressed their satisfaction with the given options where P1 stated "I felt some of the options had so many questions that would navigate me further…about the courses, I think that's great" (P1, l. 99-101). P5 agreed that they also "like[d] how the options went into depth [giving them] more options to…specify" (P5, l. 174-178). One of the participants mentioned they "liked the options offered" saying it was "personable and very relevant to their target audience" (P13, l. 116-118) reinforcing their satisfaction with the Virtual Coach options. Additionally, one participant felt that the options were convenient as they "didn't have to fill in loads of different boxes" (P15, l. 156-158) and described the selection process of the options as "easier and less open-ended" (P15, l. 291-292). Whilst positive aspects of the options provided were expressed, other participants did face some issues when interacting with the Virtual Coach. One of the issues mentioned was the lack of range in the options provided where participants stated that the chatbot "didn't really develop options" (P1, l. 104-105) and "it didn't really give me any options" (P2, l.113). Many participants felt the options were "very limited" (P4, l. 160) for certain courses compared to others. P6 agreed with P8 to mention that "sometimes [they] only received one option" (P6, l. 92-93) where they would prefer to have other options to "look at more than one" (P8, l.84). For this, P3 suggested that the bot could be improved by including "more options" as a solution (P3, l. 56). Participants did feel "the options were a bit underdeveloped" (P14, l. 63-64) where they felt the bot was not tailoring to their needs on the website. Another issue that was mentioned by participants was the lack of correlation between the options; "I feel the option are not linked with each other" (P1, l. 46-47) and "I don't see the link between it [the topics]" (P3,1.59-60). [34] states that AI systems' abilities to recognise individuals' requirements allow chatbots to provide answers as a response, which is supported by P13's comment as the bot gave them options based on their input. This was recognised by the participants as personable and relevant to the target audience. P15's opinion on the easy selection process is recognised as a good feature by [7] who felt the use of AI to produce responses from keywords input by users was efficient when responding to user queries.

3.6 Content

The fifth theme explores the content presented by the Virtual Coach and the topics on the website which were explored by the participants. Participants felt there was a lot of relevant content presented to them by the bot where one participant said, "it was reassuring that at the end [there was] a bunch of…courses

to do career wise" (P5, l. 467-468). P19 described this as the "most powerful function in [the] chatbot" (P19, l. 76-77) suggesting that the content was very relevant and useful. P15 agreed with the usefulness of providing career choices and added that they "really like[d] the basic life skills section" reinforcing their experience when looking through the website content-wise. However, P5 did feel that the video content they received seemed "thrown at [them]" where they "wanted to see…a range so [they] could pick from it" which shows the content as rather lacking and not applicable to which P1 agreed. P16 added that the bot suggested careers without "really taking into account ever answer it was…saying" (P16, l. 43-44) further reinforcing the bot's responses as lacking relevance to the content.

Participants also recognised the universality of the content where they felt the wording of the used language to present the content was also very good describing it as "not too wordy" (P1, l. 293) and the language as not "complex at all" (P14, l. 395). Participants did have ideas for improvements in relation to the content presented by the chatbot: "pictures and…visual things" (P4, l. 228) would help when presenting topics and "auditors speaking to you" (P4, l.484) by "targeting the senses…like hearing" (P3, l. 487-488) suggesting an auditory option which could help a range of individuals visiting the website, providing a universal experience. In addition to these improvements, another participant added that the Virtual Coach should be accessible to those who speak in different languages and being accessible to "females in underserved countries" (P5, l. 563). One participant, in particular, felt that the bot should give them "recommendations for how [they] could go and learn" skills they needed to develop (P16, l. 262-263). Related to P19's comment on relevant content, [35] found that an AI Chatbot can provide a useful experience in an educational system when the bot is able to intelligently match the content required for the learners' needs. They continued to state that chatbots can achieve this by evaluating the learners' desires and obtaining the relevant material ([35]. Having the Virtual Coach identify the text input from the user, it can successfully identify the goal or intent of the user, essentially helping provide them (users) the relevant content [36]. Both P5 and P19 comments are in line with this as they mentioned the significance of the Virtual Coach's recommended courses based on their input and what they were looking for. Unlike this, P16 stated that regardless of their input, the suggested outcome for them was irrelevant to what they were looking for. This is in line with previous research as [36, p. 41] found that the bot was not able to respond to "follow-up queries" acknowledging this may be a problem that users encounter. [35] conveyed the important factor of apps allowing voice command as a feature which was a comment P4 touched upon as a recommendation for the chatbot to become more accessible to other users around the world through different visual and hearing aids. Adding to the topic of accessibility, [37, p 2] also stated that their medical consultant chatbot's aim was to provide responses to patients in a reduced, "generic text" manner which is in line with what participants said in this study.

3.7 Expense

'Expense' was another theme generated from the information gathered where it delves into the costs and subscription plans the participants feel the Virtual Coach and website would be for. P3 started off stating that they would be willing to pay "not more than twenty pounds" (P3, l. 587-588) as a "monthly fee" (P3, l. 599) where they added that if "[they] got everything [they] needed" (P3, l. 595) they wouldn't need "to access it anymore" (P3, l. 596) stating that the use of the site may be a one-off purchase rather than an annual or monthly one. Contrary to this response on costs, P2 felt "twenty pounds is a bit too much…. maybe like ten pounds" (P2, l. 633-635) as the maximum amount she would subscribe to monthly where P19 added they "would pay for it because it's so easy and accessible" (P19, l. 547) even though they failed to specify the exact amount. Unlike the participants that expressed what they would subscribe to the bot for, P7 affirmed they "don't think people [would] be willing to pay for the whole website" (P7, l. 233-234) but instead just "specific things like the courses" since they felt certain aspects of the content could be accessed for free. P8 agreed to this adding "if there was to be any sort of charge for this website, it should be in a more personable area where its more connected with the person" (P8, l. 256-259) when using the website. Research on expense has found that a major benefit of AI chatbots are the reduced costs in general [34] where access to online education materials would be economical over time [2]. [38] supports online education being lower-cost in general, having found that institutions do charge less tuition fees for students suggesting this as a result for being demanding of less physical resources. In addition, [2] stated that a cut on travel costs seemed to a significant aspect of why online education was perceived as less expensive. [34] continued that this would benefit support received by the users due to access and aid at any time in the day. [39] added that human assistants are not needed to aid users – being significantly more time-consuming and expensive.

3.8 Technical Aspects

This theme of 'Technical Aspects' was addressed prolifically throughout the course of our focus groups. Initially a few participants did mention that they appreciated the Virtual Coach popping up when they entered the website: "coming onto the website, I quite liked how it kind of popped up on the side" (P5, l. 166,167) and "pops up at the bottom right and it's a different colour to the rest of the screen…so it's clear" (P15, l. 604-606). In addition, something that was also consistently mentioned by the majority was an issue with regards to the AI Chatbot restarting. P1 began with mentioning how "it didn't restart for me, I had to do it again. … I did it a couple times, sometimes it worked, sometimes it didn't" (P1, l. 65-69) to which P5 said "I think after like doing it three times, the restart button just wouldn't work" (P5 l. 179-180) which P10 found "annoying" (P10, l. 362). Participants noticed this issue and did conclude it was a "glitch" (P1, l. 69) or "malfunction" (P14, l. 91).

Another issue identified by individuals was involving the links provided by the bot whilst browsing for content through the given options. One participant stated "suggesting me to go to this link … it wouldn't go to the link" (P4, l. 75-76) and another also saying "when I…click on the link…it takes me to a new tab… it brings up a new AI Chatbot" (P8, l. 200-202) saying it must have happened "five plus times" (P8, l. 203) indicating it may not have been a one-time error. One participant did say that after selecting a certain set of options they were "kind of expecting there to be a link" and instead got "nothing" (P15, l. 237-240). One focus group, in particular, did experience an issue with their personal details being auto filled on to the website where P15 said "I got the Google Pay thing coming up, for my credit card details" making them "suspicious of the website" (P15, l. 576-579). P16 also had this issue where they couldn't actually get out of it [website] unless… [they]pressed escape" (P16, l. 204-205). A smaller error that was recognised by participants were grammar and spelling errors: "prioritise was spelt wrong a couple of times" (P15, l. 649-650) and "it's just punctuation error" (P11, l. 144). A participant did notice that the video thumbnails were identical and thought "it was recommending [them] the same video" (P8, l. 355) when giving different videos, and instead suggested that "changing [the] picture…could literally change someone's choice whether they [would] want to click and watch" (P8, l. 360-362).

Many participants did suggest further improvements on the technical aspects of the Virtual Coach. Firstly, participants wanted the enter button to be of use as a tool when submitting their responses in the conversations with the Virtual Coach. This is evident throughout the focus groups: "I couldn't use the enter button, I had to press the arrow" (P3, l. 339-340) to which P5 and P16 agreed "I couldn't press enter" (P16, 196-197), "I had to actually go click it" (P16, 199). P3 had a technical issue when minimising their screen "I'd like to be able to access the…website at the same time as the chatbot even if I minimise" (P3, l. 374-375). P3 suggested instead that it would be better to be able "to see both the chat bot and the screen" (P3, l. 386-388) so that she could understand the overall conversation with the chatbot. The final technical improvement mentioned by participants were regarding post-browse on the site and their interactions with the Virtual Coach. P8 recommended "a continuation…if I created an account…be linked" (P8, l. 204-208) where the chatbot follows up on the user's progress. P7 added that it would be "helpful" (P7, l. 330) if the AI bot said "" Please provide us with your email address so we can send you a copy"" (P7, l. 332-333) when referring to the personality test as an example so that the user would not have to "go through the whole thing again" (P7, l. 338) and try to figure out their previous answers. Furthermore, "a button saying … "Is that all I can do for you?"" (P15, l. 330-331) was mentioned as a good way to wrap up the conversation with the bot, to which P18 added another example question the bot could ask: "Was the video useful?" (P18, l. 334). When P18 added that the use of their name "a couple of times" (P18, l.392) would integrate their experience further, P15 contradicted this to state that they were "not necessarily sure [they'd] want it to remember [them]" (P15, l. 429-430) with regard to their "data protection and stuff" stating they would prefer to only have that if they "log in", protecting their privacy that way. P8's comment "I feel that's good because it feels like a lifelong conversation rather than it just being restarted all the time" (P8, 315-317) highlights a potential smoother technical experience with this change. The ability of the chatbot to pop up to the user was found to be very accessible to users such as P5 and P15 in the focus groups. Similar to [34] point of accessibility to aid throughout the day, [40] state a chatbot's role is to pop up onto the chat to assist the user anytime where their interactions are to give insight and lead them. With regards to P15's comment on privacy concerns, it was found that such privacy risk was found to decrease overall user satisfaction according to [41]. [42] added that privacy and security was one of the major concerns with consumers due to access to personal details, which reinforces P15's observation. Contrary to P4 and P8's negative comments on the links from the focus groups, [43] stated that their AI had the ability to retrieve certain links requested from their library databases as a response for users which could also be incorporated into our Virtual Coach. With regards to improvements of our bot, some participants expressed there were minute errors regarding spelling and grammar. In a study by [44] on making chatbots more conversational, they mention their system having the ability to analyse syntax and grammatical properties

to reciprocate a more human-like, natural conversation which could be used in our Virtual Coach. Another issue addressed by participants was the enter button of no use which could be improved as [45] did in their study. They described how the enter button can send the user's input in the conversation space in their AI conversational chatbot. It is clear that the Virtual Coach is an advanced method of aid for individuals, 24 hours of the day, and may need further technical enhancing in order to present a wholesome experience for users.

4 CONCLUSIONS

It is evident that there were both positive and negative user experiences with regards to the Virtual Coach's true purpose, content, and overall interaction. Majority positive interactions with the bot were found to be from its use to guide individuals through the website in a less time-consuming manner and in having an easier and obvious selection process. Research shows modern learning technologies should be more accurate and intelligent to help students formulate practical learning guidance and intervention [47]. In contrast, the areas of improvement for the chatbot focus on the lack of universal experience, links not working, and scripted, inhuman conversation. Though this is the case, a multitude of research in this field suggests that our Virtual Coach can be seen to have a large impact in a broad range of areas - from customer service to education - showing its significant use and impact on a global scale.

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