ORIGINAL RESEARCH

What are the experiences of student nurses with online learning? Do they have the necessary digital and technological competencies?

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ABSTRACT

Background and objective: Student Nurses have been conventionally and predominantly taught face to face for several decades. A recent surge in teaching student nurses online in the last decade has been expedited by the onset of the covid-19 pandemic. A significant number of research on online learning, focuses on its effectiveness from an educator's perspective. Exploring student nurses' experiences with online learning in relation to their digital and technology skills readiness is pertinent to informing a student-led pedagogy. The research aims to explore the experiences of student nurses with online learning and if they are digital and technology skills ready for online learning or not.

Methods: The study is a descriptive qualitative research, which utilises Interpretative phenomenological analysis and hermeneutic Interpretative phenomenology. Four pre-registration student nurses in a university in the South-East of England were recruited for the study. Individual face-to-face tape recorded semi-structured interviews were conducted with verbal and written consent from participants. Data collected was concurrently transcribed and analysed. Preliminary codes were given to the collected data to describe the contents. Interviews were then searched for patterns in the given codes from the transcripts. The themes that emerged were reviewed and refined with written up verbatim quotations from participants to support interpretations. A reflexive diary was kept by the researcher throughout the research, to reduce the likelihood of biases.

Results: The themes that emerged from the collected and analysed data indicated that student nurses were digital and technology skills competent to engage in online learning. Online learning was deemed beneficial by all students although a preference for face-to-face learning was reported. Factors that inhibited students from fully engaging with online learning included internet hitches and the inability of nurse educators to use technology. A lack of effective communication between lecturers and students during online learning also marred the experiences of students. Environmental distractions at home and a lack of support from peers and lecturers during online learning were further cited as inhibitors for online learning.

Conclusions: The Nursing and Midwifery Council (NMC) requires qualified nurses to have sound technology skills for care delivery. Considerations for online learning must include a prior technology skills competence assessment. The approach will ensure a level playing field for all students who engage in online learning. The appropriate support and interventions can be put in place for students who may not have the prerequisite level of technology skills to engage in online learning. Findings supports a blended learning approach with a student led digital and technology skills baseline assessment, prior to online learning. The approach will ensure a successful co-creation with an amalgamation with pedagogy.

Key Words: Student nurses, Online learning, Digital technology, Competence

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1. INTRODUCTION

The covid-19 global pandemic expedited the move for online learning for nurse education, as face-to-face teaching was impossible.[1,2] Other reasons cited for an increase in online learning includes improved internet access, flexibility for students and its ability to save time.[3] There is currently no tool or baseline assessment to determine students digital and technology skills competence for online learning. It is ethical and morally right to enquire if students are technology skills competent to engage with online learning, prior to its commencement.

1.1 Background

Digital technology in teaching and learning refers to access of information and teaching with computers, smartphones and other relevant electronic devices, which can store and process data.[4] The study of Booth et al.[5] considered online learning as one that includes any teaching that takes place virtually online and is teacher-led. Online learning has various aspects such as simulations, instructional videos, quizzes and scenario-based online delivery.[6] The term online learning in this study in consideration to explored definitions refers to students' engagement with live online lectures or seminars, including simulations, quizzes, videos and any teaching adjuncts used in online delivery. It further includes virtual access to the Blackboard platform and instructor led teaching and learning resources provided as an adjunct for online learning.

1.2 Rationale for online learning

Online learning in universities is critical for lifelong learning, and further improves digital technology and professional proficiency skills. Digital literacy proficiency enables the acquisition of other skills and competencies which are relevant for life.[7,8] Emphasis must be placed on nurses' technology skills to improve nursing care, in a rapidly paced genomics and medical technologies.[1,7,9] Digital Skills for Health Professionals and the European Parliament (2016) survey of over 200 healthcare professionals' experiences with digital technology skills, highlighted a lack of competence in digital and technology skills for many.

The lack of technology skills competence for nurses were attributed to no training or very little training with technology in their education. The government and the NMC are keen to address competence in technology skills to equip nurses to efficiently perform their roles. Digital literacies are entablements which enhances lives, by creating an understanding for nurses to thrive in a technology and digital era.[2,7] Digital literacy allows the development of skills, behaviour and attitudes in proficiency with technology, communication, collaboration and teaching and learning.[2,7] Ayebi-Arthur[10] assert that nurses will continuously face a disrupted change in practice by the middle of their careers, due to digital and technology skills advancement. Health Education England[11] warn that action is urgently required for nurses to develop new skills and knowledge in digital and technology in the wake of technological advancement and its usefulness in delivering health systems.

Technology skills competence for nurse education therefore suggests an enablement of holistic skills for the future nursing workforce. It is consequently fair to infer that the ability of student nurses to engage with online learning may indirectly investigate their digital and technology skills competence for online learning. The inference made is based on the lack of baseline in measuring the technology skills competence of students who engage in online learning. The experiences of student nurses with online learning in relation to their readiness for online learning requires exploration, to enable a successful student-focused online and pedagogy informed online delivery.

2. METHODOLOGY

The study was informed by ontological relativism for the implementation and interpretation of what meaning constitutes. Ontological relativism implies an awareness of several truths and the contextualisation of what 'truth' is.[12] Sova[12] and Bradshaw et al.[13] assert that the origin of relativist ontology perceives knowledge to be a social construct. Qualitative research using Interpretative phenomenological analysis (IPA) was found suitable in looking at the unique experiences of student nurses with online learning in relation to their digital and technology skills competence for online learning. The decision made for the research design was constructively aligned to the goals of the proposed study. Maltby et al.[14] argues the imperativeness of the critical analysis of research designs in ensuring its' suitability for any research.

Contemporary acknowledged proponents of IPA[15] postulates that human beings are sense making beings who can give reflective accounts of their experiences. IPA's three main theoretical underpinnings of goal facilitation includes phenomenology, a philosophical approach which seeks accounts of lived experiences of humans and their perception, rather than within prescriptive pre-existing theoretical underpinnings.[9,15,16] Another theoretical basis of IPA is its hermeneutic nature, when participants try to make sense of their experiences, while the researcher also attempts to make sense of what participants are describing; this is termed as double hermeneutics.[15,16] The final theoretical premise of IPA is its idiographic nature, it thoroughly examines and

analyses individual participant accounts in a detailed manner before generalisations are made.[15, 16] The underpinnings of the study's research design were synergistically linked with IPA to aid a strong research design and a credible study.

2.1 Research participants

Homogenous sampling was used to recruit participants for the study, considering the nature of the ontological phenomenon under study. Purposive sampling matches the sample appropriately to the research goals to ensure credibility, dependability, transferability and confirmability to improve the study's rigour.[13] An email was sent to only students on a BSc pre-registration nursing programme, who had engaged in online learning, in view of homogeneous sampling. Students who had been taught by the researcher were excluded from the invitation to eliminate likely power imbalances.

2.2 Research methods

Four female students who responded to the email sent, were recruited for the study. IPA lends itself to fully appreciating each participant's account, allowing small sample sizes for an extensive detailed analysis of each case.[17, 18] Individual one to one semi-structured interviews are the most appropriate interviewing method for IPA, it allows the development of unanticipated themes.[19, 20] Individual one-to-one semi-structured interviews that lasted for approximately 60 minutes was conducted. The data was securely stored in line with the research ethics guidelines of the university within which the study was conducted. The researchers' reflexivity created an analytical consciousness, insight and self-awareness throughout the research. Total transparency including self-awareness within thoughts is imperative in qualitative research for philosophical sensibilities (see Table 1 for interview questions).[9]

Table 1. Interview questions

Interview questions
Have you engaged with online lectures, sessions or learning before?
Tell me about what you think of online learning so far.
How did you find joining online lectures when online sessions begun?
How have you found online learning?
How would you describe online learning so far?
What makes you describe online learning the way you have?
How would you describe the device you used for online learning and it's functioning?
How was it for you using technology in view of online learning?
How would you describe your digital skills for undertaking online learning?
How would you describe your technological skills for undertaking online sessions?
What are your comments on online lectures and your readiness for online learning?
What factors made you ready or not ready for online learning?
What would you like to change about your online learning experience?
Were there any aspects of online learning that you enjoyed and why?
Were there any aspects of online learning that you disliked and why?
How would you describe your online learning experiences overall?
How was online learning in view of your expectations?
Did online learning meet your expectations or not?
What is the rationale for your comments above?
Do you have any other comments regarding online learning and your digital and technology skills to add?

2.3 Preliminary data analysis

Data collected was securely stored and destroyed after it was repetitively listened to and transcribed. Data immersion provides new information and insight to the linguistic use of content, metaphorical statements, context, words or phrases that are repeated for the connotations of the study.[9] The data analysed for this study was through a hermeneutic circle indicating convergence and divergence. IPA emphasises on convergence and divergence in experiences, with a detailed and nuanced analysis of the lived experiences being studied. Smith et al.[15] and Eatough et al.[17] assert that the analysis of lived experiences can be obtained through a hermeneutic circle. Smith et al.[15] believe the hermeneutic circle to be an endless movement that takes place within parts of a whole

such as moving from words to sentences, and paragraphs of whole scripts. The relationship between researchers and participants in hermeneutics is termed as two points on a circle.[15] Analysts move continuously to build meaningful narratives in conjunction with whole experiences, to gain a shared understanding.[21] The participants and the researcher were on a hermeneutic circle with repetitive movements during interviewing in creating a sound reflective account of participants experiences.

Creswell[16] gives further insight into the hermeneutic circle by stating the imperativeness of linking the 'whole' to relevant cultures and customs to broaden parts of a whole relationships, analysis and contexts, in contributing to knowledge. Multiple participants indicate more halts on the hermeneutic circle which are inculcated into evolving analysis and interpretations in building a highly nuanced understanding of the phenomenon of study[15] In preliminary data analysis as indicated above. The preceding statements on hermeneutics in IPA consolidates the stance of social constructivism that knowledge is built differently within various cultures and historical perspectives.[22] It infers that no theoretical underpinnings can be the same in its application if cultures and historical perspectives are imbued in all human interpretations. The hermeneutic circle emphasises the criticality of IPA researchers in grasping the holistic nature of the methodology, for meaningful and insightful understanding of 'lived experiences' for an accurate interpretative reflective account.

2.4 Thematic data analysis

Recorded data was listened to several times prior to transcription to enable data immersion before it was coded and analysed using a thematic analysis. The next stage of data interpretation for this study involved the transformation of notes to show the themes that had emerged. IPA data interpretation seeks connections within emerging themes by grouping them, through the consideration of the similarities between concepts, to give individual clusters a descriptive code.[9, 23] Similarities within individual concepts were considered to give the clusters codes for description. Connections and similarities that existed amongst the themes that were beginning to emerge were coded. Initial themes retrieved were discarded as stronger themes that emerged made them weaker. Themes were then finally refined and written up with verbatim quotes from participants to buttress the interpretation.

2.5 Ethical considerations

An ethics application was submitted and gained from the ethics committee of the University within which the study was undertaken. The rights of participants in research include anonymity, confidentiality, right to privacy and the prevention of harm.

3. FINDINGS AND DISCUCUSSION

The three themes that emerged were technological, environmental, social and physical aspects of online learning.

3.1 Theme one: Technological aspects of online learning

All students expressed a technology skills competence for online learning, with more than one device for online learning. Half of the respondents attributed their technology skills competence for online learning to undertaking online learning in college, prior to their training. The other 50% attributed their digital and technology skills competence for online learning to an IT session that they attended during university induction week. Under findings, I noted these statements: Internet connectivity issues during online learning were raised by three quarters of participants, although online learning was reported to be economical, convenient and beneficial by all participants.

"I am in that generation that grew up with technology, I used technology when I was learning in college. It was getting used to and finding things on blackboard at the beginning, but it was all right, my digital skills are excellent. I did attend the online virtual day on how to use blackboard in induction. Online was hectic, few times links were not sent out or links were sent but lecturers were absent, or technical difficulties. Occasionally the links to join the online sessions did not work I kept up with my tutor group for updates. I pay attention in class, but I can listen to the recording over and over... You don't get this with face-to-face sessions." Participant A

"Online learning was not too high tech for me, I would have gone to IT or student support if I had issues with my IT skills. My IT skills were average prior to using computer for online learning. I don't think anyone struggled to use a devise for online sessions." Participant C

"I was a bit anxious at the beginning, but it was alright once we started. My experience for online learning was great. I used my laptop and phone." Participant B

Participant B further described the emotion she felt when online learning commenced and talks about her satisfaction and digital and technology competence to engage in online learning.

All participants recollected sessions when they experienced issues with connectivity.

"I also used my laptop and iPad for online learning, it was ok

but being in the student accommodation, our Wi-Fi was cut off at times. One day the electricity got cut off and I had to run to the library to re-join the session." Participant A

Participant C reported OL strenuous when sessions were longer. At least half of all participants discussed frustration with internet connectivity issues during OL.

"I used my laptop for OL, it strained my eyes, sometimes online sessions were 4 hours, network was an issue, a lot of disconnection. Most of my friends said they were having internet problems and had to login and out a couple of times during the sessions." Participant C

All participants recollected sessions when they experienced issues with connectivity. Participant D described support during online learning as inadequate although she was digital and technology skills competent for online learning. The relevance of peer support during online learning was discussed, which was in congruence with 100 percent of participants accounts. She further attributes this to a lack of induction which consequentially led to a lack of peer support. There is divergence in participant D's account and other participants statements regarding induction support with digital and technology skill. A convergence was however observed between induction support with technology, and a cascade of other support mechanisms that enhances learning.

Participant D uses prisoners in own home in describing online learning. There appear to be a build-up of frustrations with issues with online learning, until it peaked. Students engaging with online learning were described as prisoners. This depicts the intensity and enormity of the isolation felt during online learning.

"I find the materials easy to use, my college course was online. My digital skills are excellent. I have had a good experience with online learning. I used my phone, it was a bit slow. I also used my IPAD and desk top computer. A lot of snags with online learning, the system crashes, the internet goes, the camera is not working, people are prisoners in their own homes during online learning. I did not have an induction and missed out on friendship within the group." Participant D

The study findings of student competence with digital and technology skills to engage in online learning is consistent with the studies of Dery et al.[24] which suggested 99% of health and social care undergraduates knew how to use technology to engage in online learning. Dery et al.[24] study did not however use any digital and technology metric in defining or measuring students' competency in digital technology for online learning. It is therefore difficult to accurately compare both studies and other similar studies, in view of the subjectivity of not having a standardised measuring tool. It could nevertheless be argued that competence from a student's perspective is what it is and must be accepted as such. Barriers that students faced with online learning instigated a preference for face-to-face learning although online learning was reported to be economical and convenient. This study emphasised the convenience of online learning but a preference for face-to-face learning.

3.2 Theme two: Environmental and physical

Environmental factors that distracted most students from engagement with online learning included, tiredness and boredom from spending a long time on screens. Distractions from students' home environments and that of some lecturers, were reported as inhibitors to online learning. All participants cited home distractions including social media, entertainment, children, siblings and parents. The inability of some lecturers to use technology to teach effectively online marred students experiences of online learning. 100% of participants used strong emotive words for online learning when discussing distractions during online learning. A lack of self-awareness of some lecturers such as leaving a session to pick up a parcel, and its associated pedagogical impacts during online delivery were raised by participants.

"With the real people it's different, I felt sleepy, distracted, strained my eyes, a knock on the door etc, concentration was difficult with online learning, it is good to see people's face and engage but it felt like a robot teaching when the lecture was online. I found that these issues made online learning disruptive, intimidating and I worried about understanding." Participant C

Participant B used the word anxious earlier for online learning and disruptive, Participant C interestingly used words such as worried, strenuous, disruptive and intimidating in describing online learning. Participant A used the word hectic for online learning which indicates convergence of students' difficulties with online learning, although they reported digital and technology skills competent for online learning.

"People speak English as an additional language, lecturer support is better with face to face. Online learning is hectic, too much slides on the power points..... questions cannot be answered. I have dozed off and fallen asleep, I will be on my desk all morning, maybe by lunch my bed is just there, I lie down and fall asleep..." Participant B

"... The students and lecturers got too comfortable with online learning. Sometimes you hear the doorbell ring, the lecturer says hold on guys, I need to get this. It goes quiet, the screen goes black, you start going through your own phones, engage with social media and then you don't pay

attention anymore. We all say, did the lecturer just leave the session for a post?" Participant A

"Being at home for online learning was disruptive, I have prime, Netflix, I have the TV on, kids in the background, the door buzzer goes, the phone goes, sitting at home on an uncomfortable chair, you name it." Participant C

"A slap on the laptop, mic unmutes accidentally, children are heard, very disruptive....washing machine spinning from the lecturer's mic, organisation could be better. We've had people unmute accidentally. You hear the lecture and someone's full conversation.... I don't think all the lecturers knew how to mute students on blackboard." Participant B

"Lecturers need to know themselves, they need to attend teaching sessions on how to use blackboard for online teaching." Participant D

The inability of some lecturers to use technology to teach effectively online marred students experiences of online learning. This study finding is harmonised by Krick et al. (2019) study findings on nurse educator difficulties with teaching online, due to a lack of digital and technology competence. Digital and technology skills competence is therefore pertinent for educators who teach online, to enable a seamless and effective delivery online. It was further evident that students cannot consequently engage with online learning, until educators themselves are ready to teach online. Universities need to adequately plan, engage and support academics in a two-way deliberative dialogue, prior to online teaching to ensure competence. The introduction of any digital platform needed for teaching needs to be meticulously planned and rolled out for academics by universities. Academics, students and relevant stakeholders need to be also involved in the design of any such technologies, for an optimum output. Institutions could further consider a hub with individual sound -proof booths for online learning, for students who may not have a conducive home environment to engage in online learning. Higher education institutions who deliver nursing programmes will need to support both students and staff, to ensure readiness for both academics and students.

3.3 Theme three: Social factors

Student stated inconsistencies in communication and teaching competence with online learning amongst lecturers. Tailored interpersonal support from lecturers during online learning compared to face to face was also expressed as insufficient and an inhibition for online learning. The lack of lecturer and peer support during online learning was reiterated by all participants.

"Online learning was average, it was convenient and economical, but not great with interactions with lecturers and students. The lecturers wouldn't see, my virtual hand up or you put a question in the chat and there is not enough time for them to answer, engagement online is never the same compared to face to face." Participant C

"Some lecturers ask a question, I'm typing, within 3 seconds, they say here is the answer, I'm like what? Sometimes people then unmute to give an answer and we have 5 people talking simultaneously which is annoying and disruptive." Participant B

"Some of the way some lecturers put information on blackboard during online learning could be better, you cannot find the information, different links and stuff like that... Communication during online learning is key, I did not feel that communication was good, it does not help in supporting students. We need to have online learning... be clear, concise, communication has to be good." Participant D

"In reality lecturers shouldn't make excuses... One lecturer said I am learning, I was thrown into this, not prepared mentally and don't know how to teach online, like you, I am struggling. I'm thinking you learn it first and come teach me..., if you are not confident teaching, how am I meant to be confident in learning?" Participant A

"Socialising with peers during face-to-face sessions were also stated to be crucial and relished by students, with peer support as instrumental to their learning. I prefer a 100% face to face although it is not financially cheap, it is good to interact with friends and lecturers. Interactions with my colleagues stimulated my learning and support from each other as well as learning from each other." Participant B

Students' preference for face-to-face teaching included online learning being fraught with technological issues such as internet hitches. There is a possible link between the stress and anxiety expressed by students and the internet connectivity issues that they experienced during online learning. Zhang et al.[25] study concluded that online learning exacerbates mental health issues such as depression, insomnia and anxiety. Academics have only focused on the quality of education with online learning and ignored the hidden negative aspects of online learning such as internet addiction and mental health issues.[4] Universities must provide adequate and timely mental health support for students particularly during online learning. Support strategies provided for the mental health and wellbeing of students during online learning needs to be insightfully proactive. Universities must support staff wellbeing, to enable and equip staff to adequately support the wellbeing of students.

"I am upset that we pay over £9,000 and watch videos online. I like face to face, I like to see the lecturer and my classmates.

Face to face the lecturer sees you don't understand, they help you. Online the lecturer does not see your face, you type in the chat, but the lecturer is not able to give you the specific help you need. Online support is generalised but face to face is specific." Participant A

Study findings suggests social isolation from peers and lecturers during online learning with a lack of adequate support by peers or lecturers. Study findings resonates with the study of Fawns et al.[26] emphasising the social isolation of students during online learning and how communication and relationships are intrinsically suboptimal. It is critical for lecturers to ensure clear communication with no ambiguity for a successful online delivery.[27] Study findings highlighted the imperativeness of social interaction with peers and lecturers in the learning process during online learning. A clear need for opportunities for students and lecturers to interact face to face during online learning was further expressed. A well-planned and organised teaching with clear and timely communication and support for students during online learning is recommended. Lack of support for academics during online teaching could impact on the support they are able to offer students during online delivery. Further research is needed on online pedagogies with a focus on communication, social integration and interaction.

3.4 Limitations

Few students participated in the study; it is also possible that the study could have attracted students who had a keen interest in using digital technology which could consequentially impact on study findings. Qualitative research findings often have narrower generalizability due to biases that homogenous sampling creates. Social constructivism conversely accept that knowledge is built differently within various cultures and historical perspectives.[22] Social constructivism highlights that knowledge formed including one during reflexivity is unique to individuals. Cultural and historical contexts perpetuate knowledge, reflexivity may not be however inadequate if all knowledge formed have cultural and historical outlooks.

4. Conclusion

Study findings suggest student competence with digital and technology skills for online learning. The current trajectory of a rapidly growing use of digital technology and literacy in nurse education appear relevant to every aspect of society. Online learning is critical for lifelong learning, it improves digital and professional competencies and enables the acquisition of other skills.[7,8]

The programme requirements of NMC includes a digital and technology astuteness after programme completion. Significant challenges in the use of technology by nurses is still an issue for nurses regardless of the major advancement in digital technology. A lack of digital and technology skills assessment prior to online learning in nurse education is problematic in view of the need for nurses to be digital astute. Emphasis must be placed on the digital and technology skills needs of healthcare professionals, through tailored training to suit the needs of healthcare students. It is unclear how institutions delivering nursing programmes measure the digital and technology skills competence of students to meet programme completion outcomes. It is currently a requirement that nurses have a grade C in both Math and English before they can be considered for nursing. The lack of a standardised tool for measuring digital and technology skills competence for online learning does not afford educators an accurate assessment of the digital and technology skills competence of students, to competently engage in online learning. The nonexistence of a student informed evidenced-based metrics for defining and measuring digital and technology skills of students, renders the accuracy and standardisation in measuring the digital and technology skills competence extremely difficult. It is unclear if some of the barriers of online learning such as students' inability to find information on Blackboard, has a direct association with their level of digital and technology skills competence. An evidenced based and student led and informed digital and technology skills metric, for defining and measuring competence in digital and technology for online learning is needed. It will create accuracy and standardisation to reduce the subjectivity and ambiguity in determining students digital and technology skills competence for online learning.

Study findings further indicated a link between nurse educator readiness for online learning and students' readiness for online learning. A collegiate and multi-disciplinary online course design approach led by expertise including NMC and HEE requires consideration. A tailored digital technology training and annual updates, that are reflective of online delivery, needs to be readily available for staff. Internet connectivity issues can negatively impact on student learning and wellbeing. Institutions must ensure reliable internet connections and a conducive environment for academics and students prior to online delivery. Inconsistencies in the quality of online teaching amongst academics with suboptimal communication were issues students raised. Poor social interaction and support from peers and academics during online learning were poignant concerns that deterred students from online learning. Social interactions and the emotional wellbeing of students must be considered and prioritised during online learning. The study has indicated that sound digital and technology skills competence for online learning is not harmonious to a readiness for online learning. A blended

learning approach may be a balanced consideration if all the factors that impact on online learning are fully considered and addressed. The approach may enable nurse education to meet its programme requirements of digital and technology skills competence for all nurses upon programme completion. Findings adds to current research and instigates further studies from a local, national, and international level for a digital and technology skills measurement tool prior to online learning. The aim of this study did not enable the consideration of such a tool, this would require research and a collegiate approach with students, NMC, HEE, significant stakeholders, and digital technology experts. Study findings highlighted a link between nurse educator digital and technology skills readiness for teaching online and student readiness for online learning. It must not be assumed that academics will be conversant and competent with using technology for teaching. Institutions must offer regular training for academics for the various digital platforms and technology that they require or use for teaching. Study is well placed in an interpretative paradigm with the aim of seeking the individual and rich experiences of students with online learning. The study could create transferability of findings, although unique.

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