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TECHNOLOGICAL CHALLENGES AND BEHAVIOURAL IMPLICATIONS OF DIGITAL TEACHING: A QUALITATIVE STUDY OF GENERATION X LECTURERS IN HIGHER EDUCATION

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Abstract:

Educators need to constantly change their teaching practices to adapt to the changing learning needs as digital technology advances rapidly in higher education landscape. Technology is part of teaching and learning in today's age, but not all educators experience this shift in the same way. The study investigated the challenges faced by Generation X lecturers when teaching online classes and the implications of these challenges in a public university setting in Malaysia. To explore the experiences of participants, a qualitative research design was conducted. Data were collected through semi-structured interviews involving five Generation X lecturers selected through purposive sampling from a Malaysian public university through two interview modes: face-to-face and Microsoft Teams. The data were then analysed using constant comparative method to identify recurring themes and patterns. Generation X lecturers had technological challenges; difficulties adapting to fast changing digital tools, managing online teaching platforms, and technical issues during virtual classes. These challenges in turn affected lecturers' confidence, teaching preferences, and willingness to engage with technology enhanced learning system. Resistance to change, fear of technology, and lack of confidence to handle technology in teaching and learning sessions were behavioural implications from resulting from the challenges faced. Despite these

obstacles, the participants were willing to learn new technological skills to support teaching. This study demonstrates that continuous professional development and institutional support are highly necessary for Generation X lecturers to cope with the demands of digital education. The findings inform us about mid-career educators' experiences in technology-driven learning environments and how online teaching practices can be improved in higher education.

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Keyword:

Behavioural, Challenges, Gen-X, Implications, Technological



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Introduction

Digital technologies have rapidly developed over the past few years, with the COVID-19 pandemic acceleration, and these changes in teaching and learning practices in higher education have been dramatic. Higher education institutions had to keep educational activities going during periods of movement restrictions, resulting in lectures, seminars, trainings, and other academic activities were increasingly occurring through online means. Technology has allowed access to education during this period but for it to be integrated into teaching and learning, lecturers need digital skills as well as institutional support (DeCoito & Estaiteyeh 2022; Mai 2022).

Generation X (Gen X), born between mid-1960s and 1980, make up a large proportion of the academic workforce. While Bugnos et al. (2022) has mentioned that Gen X employees are often described as adaptable and resilient, the speed with which technology mediated teaching has taken hold meant that many lecturers had to change their established ways of teaching. The increased reliance on digital devices and online platforms means some lecturers, particularly those without confidence or experience in technology, find it hard to cope. Adapting to new technologies has become part of their professional responsibility.

Studies have focused on lecturers' readiness for online learning (Mai, 2022; Abuhassna et al., 2022), challenges of online education (Efriana, 2021), perceptions of online learning (Caliskan et al., 2020; Baro et al., 2015) pedagogical competencies (Bruggeman et al., 2022; Friaies et al., 2022) and technology training initiatives (Thenmozhi et al., 2022) but very little has been done to understand the lived experiences of Gen X lecturers as they adapt to technology enhanced teaching. Hence this gap needs to be filled in order to understand how Gen X lecturers cope with changing technological demands of higher education. Therefore, this study aims to explore technological challenges and implications of technology use among Gen X lecturers

so that we can better understand their experiences within changing landscape of higher education.

The COVID-19 brought unprecedented disruption to higher education globally, forcing universities around the world to quickly shift from face to face teaching to online learning. In Malaysia, the Ministry of Higher Education (MOHE) allowed higher education institutions (HEIs) to teach and learn online, provided students have access to learning resources and lecturers as well as institutional technological infrastructure were prepared for this change (Ministry of Higher Education, 2020). The policy ensured academic continuity during the pandemic, but lecturers found it very difficult to adapt to unfamiliar digital platforms and online pedagogy.

Gen X lecturers are a special group of academics because they started their careers when digital technologies were not yet part of teaching and learning practices. The speed at which digitalisation took place after the first Movement Control Order (MCO) was imposed in March 2020 required major changes to their teaching practices, professional routines, and technological competencies, but little is known about how Gen X lecturers experienced and dealt with these technological challenges in the digital higher education context. More specifically, how those technological challenges shape behavioural responses such as adaptation, engagement, and confidence in online teaching contexts. While much research has been done on online teaching during the pandemic, comparatively little attention has been paid to real life experiences of Gen X lecturers in Malaysian public universities as they made this rapid technological transition.

Despite the increasing research on online teaching and digital technology adoption in higher education, Gen X lecturers' experiences are comparatively little explored. Most studies have approached digital teaching from technology adoption, digital competence, student learning outcomes or generational differences but not how Gen X lecturers deal with technological challenges in their day-to-day teaching practice, how technological challenges are experienced and interpreted by this cohort, and how these challenges then influence behavioural responses to online teaching.

This gap is important because Gen X lecturers are a special case of higher education professionals as they developed academic and professional practices before digital technologies were widely adopted. They had to adapt to increasing technology mediated teaching environments so their experiences can help us understand the relationship between technological challenges and behavioural implications as well as extend understanding of digital teaching beyond technology adoption. This qualitative study examines the experiences of Gen X lecturers navigating online teaching, specifically technological challenges they encounter and behavioural implications arising from those experiences.

Thus, this qualitative study explores how Gen X lecturers have been challenged by technology for online teaching and learning, what it means to integrate technology continuously into their professional practice and teaching, and how these experiences and practices are shaped by Gen X academics' perspectives. By foregrounding the perspectives of Gen X academics, the study seeks to provide a more nuanced understanding of how lecturers have adapted to the evolving demands of technology-enhanced education in the post-pandemic higher education landscape. The study is guided by the following research questions:

- (1) What technological challenges do Gen X lecturers face when using technology to facilitate online teaching and learning?
- (2) What are the implications of technology use for Gen X lecturers in the delivery of online classes?

Literature Review

Online instruction has moved from an emergency measure to a permanent feature of higher education in the post-pandemic period. Active learning in virtual environments requires teaching staff to be not only technologically confident but also pedagogically innovative. Gen X academics have careers that have seen technological and educational change on a scale that demands continuous development of digital and pedagogical skills (Bugnos et al., 2022). The resilient and adaptable ones are described in literature as such; Gen X educators will benefit greatly from developing techno-pedagogical skills (Bugnos et al., 2022). Mastery here is needed more than ever before because it can help students communicate clearer with teachers as well as support modernisation and adaption of instructional design for digitally mediated learning environments.

Technological Challenges for Online Classes

The sudden shift to emergency remote teaching showed how digital literacy was so important across higher education (Joshi et al., 2018; Siddiquei & Kathpal, 2021). Literature in the field uses different terms to describe this mode of delivery; web-based training and cyber-learning through virtual instruction, but all refer to a fundamental change from face-to-face to entirely web mediated environments (Pandit & Agrawal, 2022). This sudden transformation posed huge operational challenges for Gen X lecturers, especially those who struggled with new digital demands (Bugnos et al., 2022). These challenges went beyond unfamiliar pedagogical approaches and technical software adoption. They were systemic constraints such as electricity supply problems, internet connectivity issues, and students not engaging in geographically remote areas, to name a few. Taking together these factors show how technological, pedagogical and infrastructural demands intersected to shape educators' experiences of emergency remote teaching (Gurung, 2021).

The first wave of education worldwide going online during the COVID-19 pandemic caused friction across students, educators, and parents (DeCoito & Estaiteyeh, 2022). A review of the literature identified several recurrent obstacles: platform instability; poor ICT skills among educators; hardware limitations (Ferri et al., 2020; Siddiquei & Kathpal, 2021; Efriana, 2021; DeCoito & Estaiteyeh, 2022; O'Sullivan et al., 2022). In Malaysia, internet connectivity disparities were an additional challenge, where students in suburban and rural areas often had unstable network connections and no devices suitable for online learning. These constraints disrupted online learning and severely affected continuity and effectiveness of educational delivery (Ferri et al., 2020).

These infrastructural pressures also weighed heavily on lecturers. Synchronous sessions require high bandwidth connections, and lecturers had to personally buy upgraded hardware and internet packages to keep their classes going (DeCoito & Estaiteyeh, 2022). Mandatory institutional learning management systems (LMS) were often plagued by latency, frozen interfaces, and system failure (O'Sullivan et al., 2022). Although educators of all demographics felt the impact of this abrupt transition, Gen X academics bore the brunt as they often did not

have the technical skills or software familiarity needed to navigate these digital environments smoothly (Efriana, 2021; Bugnos et al., 2022).

Behavioural Implications from Online Classes

The abrupt mandate for online delivery yielded profound socio-emotional and professional implications for academic staff. The sudden reliance on digital platforms sparked heightened anxiety, lower self-efficacy, and overt resistance, often culminating in elevated stress levels and physical burnout; a dynamic highlighting the vital necessity of institutional support systems to sustain instructional continuity (Gurung, 2021). More broadly, the emergency measures implemented globally during the pandemic accelerated the digitisation of educational infrastructure at an unprecedented scale, transforming daily academic routines and compelling rapid organisational and pedagogical restructuring (Addimando, 2022). In response to the forced digital transition, educators experienced a range of often conflicting emotions, encompassing professional enthusiasm alongside fear, uncertainty and scepticism.

In addition to infrastructural adaptation, literature shows that emotional responses also drive how educators adopt and integrate technology. Emotions can strongly influence technological readiness, anxiety and fear deter digital adoption, whereas empowerment and enthusiasm are crucial drivers (Addimando, 2022). As institutions went from emergency remote response to planned and deliberate technology integration, the psychological outcomes changed too, with positive effects on digital competence and negative effects isolation and occupational stress (Apostolidis et al., 2022). Understanding these psychological processes is needed if we are to evaluate how staff well-being changes with evolving technological demands.

Research Methodology

To capture the complexity of digital teaching and learning sessions, this study looks at the specific technological challenges lecturers face when teaching online as well as how these impacted their academic practice. Qualitative research was used to gain rich, contextually detailed insights from the lived experiences of participants (Moriarty, 2011). Five individual semi-structured interviews were conducted with Gen X lecturers in a Malaysian public university. Due to generational focus, purposive sampling was used based on age range: five female senior lecturers aged between 49 and 55 years were selected for the sample. For confidentiality and anonymity participants were given identification codes P1–P5 (Table 1).

Table 1: Participants' Profiles

Participant ID	Gender	Age	Position	Years of Service
P1	Female	52	Senior lecturer	21
P2	Female	49	Senior lecturer	22
P3	Female	50	Senior lecturer	22
P4	Female	50	Senior lecturer	21
P5	Female	55	Senior lecturer	20

Moriarty (2011) stated that to respect participant preference and make the process comfortable, three interviews were conducted face-to-face with audios being recorded, and the other two were conducted virtually via Microsoft Teams with videos being recorded. All participants were informed about the aims of the study prior to data collection and written informed

consents were obtained. A small token of appreciation was given at the end of each interview. Sessions lasted between 40 and 60 minutes and semi structured protocols with dynamic probing questions were used so emergent themes could be explored in depth (Qu & Dumay, 2011). After the fifth interview, theoretical saturation was achieved.

Data Analysis

Qualitative data coding serves as the systematic foundation for rigorous thematic analysis, facilitating the structured categorisation, interpretation and synthesis of empirical data. To ensure analytical transparency and rigour, a multi-stage coding approach was implemented. Following the completion of the interviews, the audio and video recordings were independently transcribed verbatim for each participant. The initial phase involved descriptive and open coding whereby key data extracts were summarised and foundational keywords identified. This process resulted in 21 finalised initial codes as presented in Figure 1. In line with Glaser (2016), comprehensive open coding is essential for allowing emergent concepts to surface naturally before theoretical integration.

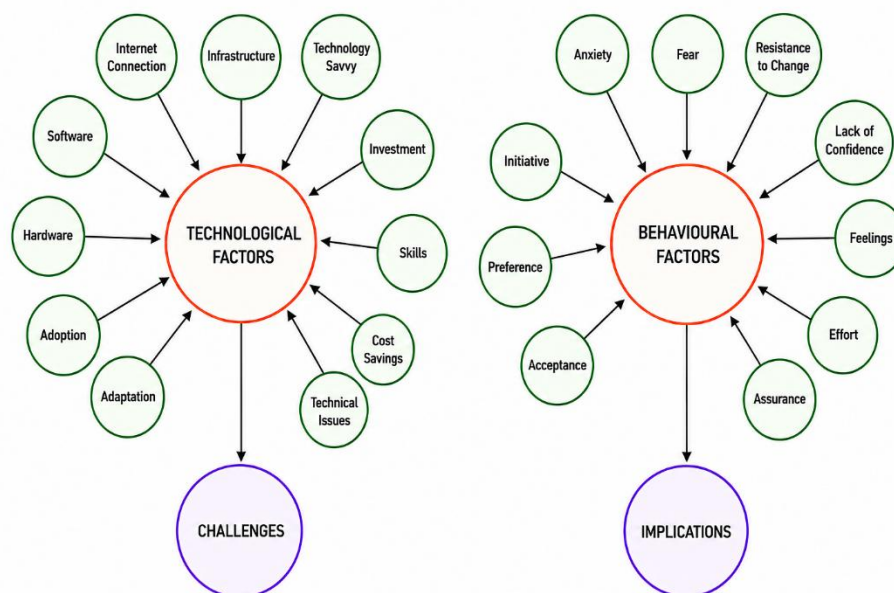


Figure 1: Findings Of Challenges and Implications Faced by Gen X Lecturers

Next, axial coding was used to shape, align, and consolidate the open codes into two subthemes: technological and behavioural (Williams & Moser, 2019). Finally, selective coding was carried out to bring together these axial themes into two broad categories that captured the core research questions; challenges and implications. Glaser (2016) states that selective coding gives structure; it avoids excessive descriptive drift and ensures analysis is focused on study objectives.

Results and Findings

Technological Challenges

Technical challenges are a major barrier to online instruction (Ferri et al., 2020; Efriana, 2021; Siddiquei & Kathpal, 2021; DeCoito & Estaiteyeh, 2022; O'Sullivan et al., 2022). Educators often experience system freezes, crashes or severe bandwidth drops during live sessions and it is often difficult to determine whether these disruptions are hardware, software, or network problems. Therefore, troubleshooting takes time and issues often remain unresolved and regularly disrupt planned schedules of online teaching and learning (O'Sullivan et al., 2022).

Eleven open codes were grouped under the axial theme Technological Challenges in the qualitative analysis of this study which are internet connection, infrastructure, technological literacy, personal investment, skill acquisition, cost efficiencies, technical friction, adaptation, tool adoption, hardware and software functionality. Internet connectivity was found to be a prerequisite for synchronous delivery. Malaysia as a developing country often experiences unstable network coverage outside urban centres, it is a structural barrier that directly affects consistency and quality of online teaching and learning.

"I have a problem with the internet connection. Sometimes the internet is unstable during class sessions. Students, especially in the rural area, also face the same issue."
- P1

"On campus, yes, a burden, due to bad Internet connection & inadequate facilities as well. At home, during MCO, we can attain a stable Wi-Fi connection we could get our hands on, so there is no problem. On campus for hybrid learning, I must use the hotspot from my own Internet, as campus Wi-Fi is sluggish in terms of connection and speed."
- P3

The excerpts above were drawn from interviews with Participants 1 and 3 that highlighted persistent concerns with regard to internet connectivity during online sessions, particularly within the campus compound. These connectivity challenges were closely related with broader infrastructural limitations, notably the teaching and learning facilities provided on campus. Some classrooms were not equipped with projectors, meanwhile Wi-Fi coverage in areas surrounding the academic classrooms was often slow and unreliable. These infrastructure shortages are ongoing challenges lecturers have faced during hybrid learning sessions.

Surprisingly, contrary to expectations that senior academics are resistant to technology use, Participants 1 and 5 had positive attitudes towards using digital tools in their teaching method. Besides that, both agreed that online platforms were relatively easy to navigate, as well as being very satisfied with online teaching and learning. It is safe to say that they felt comfortable with online platforms and enjoyed online sessions. This indicates that Gen X academics should not be considered a homogeneous group regarding attitude towards technology. The experiences of these participants show that if conditions are good and support are available, then Gen X academics can adjust to virtual teaching environments and derive professional satisfaction from technology-enhanced instructions.

"I don't have issues with technology, but I face a lot of problems with students' attitude." - P1

"I am not burdened by technology. I don't believe it creates a load." - P5

Apart from that, the sheer number of new software and applications introduced at the start of MCO was a big challenge for Gen X lecturers who were either digitally literate or likewise. Senior academics had to learn multiple complex tools in such short notice, which led to cognitive overload and anxiety, especially when technical glitches occur during live lecture sessions. These distresses are commonly faced by senior lecturers when they are forced to use multiple online digital tools daily.

"The biggest challenge that I faced with online distance learning (ODL) was first implemented was, of course, how to use Google Meet. During that period, I didn't have any experience using it." - P2

"I did try to learn new software and applications such as Microsoft Teams. However, I am quite slow, maybe because Gen X lecturers are quite slow to adapt to new technologies." - P3

To avoid these friction points in the future, virtual sessions should be a flexible hybrid delivery system that mixes real time synchronous sessions with self-paced asynchronous ones. Pedagogical platforms can then be adjusted to structural and technical constraints, where students with reliable connectivity may use interactive online spaces such as Microsoft Teams, Google Classroom, or Google Meet. Meanwhile, alternative asynchronous options can accommodate learners who have connectivity limitations, so delivery methods are responsive to specific learner needs as well as educator capacity (Ismail, 2020).

Behavioural Implications

Gen X lecturers had to learn how to use the virtual classroom. They were expected to learn on the job and implement new technologies in an ad hoc way, so much so that they became known as professional 'can-do' types. They are hard workers but they are also very resilient professionals as they sought help from younger colleagues who are more digitally savvy, attended webinars for professional development, and ran trial runs before live classes in order to minimise technical problems to avoid creating an unstable virtual learning environment for their students.

"In addition, if there is a computer problem, I will attempt to contact a colleague." - P4

"I have seen colleagues use Google Forms to track attendance. So, I tried to ask him about the Google Form technique, and after trying to set it up for class by myself, I was surprisingly good at using it." - P5

Still, the shift from closed classrooms to open digital platforms was deeply pedagogical and psychological. For teachers who had grown up in physical learning spaces, delivering content online was self-conscious because virtual platforms are public, where content exposure and performance are now more visible. As a result, even as Gen X lecturers tried hard to adapt, many of them still preferred face-to-face classrooms where interpersonal dynamics and classroom management feel more intuitive and controllable.

“No, it is not hard to follow trends. But the contents on those apps are made public, so, yes, maybe a little low in self-confidence because anyone and everyone can see. Thus, I prefer more personal and closed space contents.” - P3

Discussions and Recommendations

The aim of this study was to explore the experience of Gen X academics who were forced to teach online in March 2020 when COVID-19 hit. Empirical results showed that Gen X lecturers experienced multiple problems during online teaching and learning. Thus, institutional support that are targeted and contextually relevant are needed now more than ever. Most universities had conducted mass large scale webinars on digital delivery, but these were not effective for Gen X academics because large groups led to cognitive overload and social discomfort which may have discouraged them from seeking clarification immediately. One-to-one coaching and personalised mentoring were far more effective because Gen X educators needed time and psychological safety to practise complex software applications by doing it themselves hands on.

Furthermore, the findings highlight a critical balance between institutional autonomy and operational consistency. During the initial emergency phase, the host university adopted a decentralised approach, granting staff considerable autonomy in selecting digital platforms. While this policy alleviated the immediate pressure on Gen X lecturers by enabling them to utilise familiar tools, it inadvertently fragmented the student learning experience, creating confusion as learners navigated multiple platforms with varying interfaces. Aligning with recommendations stated by Bensaid and Brahimi (2021) and UNESCO guidelines, higher education institutions should standardise on unified Learning Management Systems (LMS) to streamline workflows for both staff and students. Finally, as higher education aligns with Industry 4.0 paradigms, institutional management must prioritise robust infrastructure upgrades including high-speed campus-wide connectivity and modern hybrid lecture spaces to ensure resilient long-term digital delivery.

Conclusion

In summary, the rapid shift to online learning during the COVID-19 pandemic has shown remarkable professional resilience among Generation X lecturers in Malaysia that is supported by peer collaboration and self-directed, skill acquisition, despite technological, pedagogical and psychological pressures. Targeted institutional interventions that move away from generic large-scale training such as personalised, one-to-one coaching and standardised Learning Management Systems (LMS) may be required to overcome these persistent challenges. Moreover, targeted digital training, peer support, technical hands-on assistance, and institutional professional development may greatly help in ensuring a smooth transition for Gen X educators to go digital. Finally, robust capital investment in high-speed digital infrastructure is vital to ease academic burnout, ensuring equitable learning experiences and sustainably position higher education institutions for the demands of Industry 4.0 in today's fast-paced competitive world.

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