A Survey of the University Students' Perspectives about Using Digital Technologies in Education: Zimbabwean Case

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Abstract
This study investigated the perspectives of university students about the use of digital technologies as tools for teaching and learning since digital technologies are an essential asset for academic institutions and they can support strategic objectives for institutions. Limited use of digital technologies could lead to a second order digital divide considering that the Governments and universities have increased the investment and the embracement of digital technologies respectively.

There is need to obtain a deeper understanding and insight into the university students' perspectives since there is scanty literature discussing the issue regarding the Zimbabwean context. Quantitative data on students' perspectives was collected using 100 questionnaires administered to students at a single university of technology in Zimbabwe. The findings concur with existing literature that students highly value the integration of technology into their learning process. However, the students indicated disappointment and frustration due to the disconnection between current teaching methods and the digital technologies.

Keywords: Digital technologies, perspectives, students, teaching and learning, university

Introduction

Digital technologies include computer, information and communication technology (ICT), learning management systems (LMS) and digital media such as wikis, blogs, social media and podcasts .They refer to a broad collection of technologies which accumulate and broadcast information in digital form and can be hardware-based device (such as computers, mobile phones and other mobile devices, video and audio players, games consoles, etc.); or software-based (e.g. web applications, blogs, wikis, Social-Networking Sites, computer games, chat sites, etc. Groff (2013) identifies video and image sharing, simulations, games and gamification, handheld and tablet computing, digital cameras, scanners, virtual environments, augmented reality and wearable technologies as emerging digital technologies available for use in higher education. Table 1 is a summary of the common digital technologies suitable for teaching and learning.

Table 1Examples of digital technologies

Common digital technologies in education	
Digital Technology Example	**Definition**
Learning management systems (LMS)	Computer programs that aid e-learning through the formation of course content (Lonn & Teasley, 2009).
A blog, or weblog	Online diary where entries are normally written/displayed in reverse sequential order and in addition to text messages, postings can include photos, links, video and audio
Wiki s	A web site design and authoring tool that permits a group of people collaboratively to add or edit web site content
Podcast	A series of digital-media (audio or video) files which are circulated over the Internet using syndication feeds for playback on mobile devices (MP3 players or iPods) and computers.
Gamification	Gamification" as the use of game design elements in non-game contexts.
Augmented Reality (AR)	Augmented reality (AR) is a variation of Virtual Reality which completely immerses a user inside a synthetic environment such that the user cannot see the real world around him. AR allows the user to see the real world, with virtual objects overlaid upon or composited with the real world.

Literature has evidence of a variety of benefits derived from teaching and learning using digital technologies. Digital technologies open up new opportunities for a more student oriented approach to learning, engage and empower students, increase peer learning and creative expression, develop literacy and communication skills. Such technologies play a vital role in facilitating learning, though keeping abreast with

latest technologies brings upon costs to institutions. Decisions about technologies need to be made with clarity of the potential benefits to students and their learning.

From an education perspective, digital Technologies can provide university management, educators and students with opportunities for creating an environment that enables different types of social interaction, ready access to information and can overcome some challenges related to the time and place constraints associated with teaching and learning that are normally presented overtime. Students can also take advantage of digital technologies to demonstrate their creativity in knowledge creation. The portability, ubiquity and low costs of digital technologies can enhance communication abilities and interactivity, enabling the Zimbabwean university students to be digital natives and prepare them for survival in an information rich digital society Johnson, et al (2013) posit that today's workforce requires university graduates to possess communication and critical thinking skills that can be fostered through technology enabled learning.

For students to compete effectively in this digital age, they must have the diverse digital skills. Emerging digital technologies like cloud, mobile, big data, and social networks can enable academic institutions in Zimbabwe to capitalize on new opportunities to improve efficiency and effectiveness and achieve quality education. More so there is evidence in literature that students who engage on relevant digital technology can positively impact on the society (Johnson, Adams, Estrada, & Freeman, 2014) hence delays in digital technologies integration widens the existing digital divide between Zimbabwean university students and their counterparts in developed nations

Problem Statement

Technology based teaching and learning is not visible in higher education institutions, particularly in the developing nations. Despite the widespread adoption and high access to digital technologies their use for learning and teaching in Zimbabwean universities has not been constant across programmes and institutions (Mbengo, 2014). Although Universities decision and policy makers encourage the use of digital technologies to enhance both the teaching and learning practices, a significant number of institutions in Zimbabwe have fully embraced the affordances of the digital technologies into the curriculum. Even among universities where the majority of students own such digital technologies and devices, their use for teaching and learning is still at its infancy (Bhuasiri, Xaymoungkhoun, Zo, Jeung, & Ciganek, 2012). More so there is little has been documentation of the students' perspectives about digital technologies in Zimbabwe's university education (Mbengo, 2014). The key questions answered by this study are:

1. What are the university students' perspectives about digital technologies in education?
2. Which digital technologies do students use and for what purpose?
3. What forms of digital technologies do students consider useful for their studies?

The current generation of university students are affectionately considered the digital natives (Prensky, 2001) hence knowledge about their digital technology choices, concerns and priorities could assist university management to make informed

decisions about technological investments from which they can get returns. Globally the university students have developed an inherent ability and reliance on technology across all contexts of their lives (Corrin, Lockyer, & Bennett, 2010) therefore answers to the preceding questions are necessary for making technological investments that favor their needs Li and Ranieri (2010).argue that mere access to digital technologies does not translate to effective use in the learning context, hence the need to establish students' view point about digital technologies in education. This is on the premise that in a study by Kennedy, Krause, Gray, and Judd (2006) university student use a range of digital technologies for entertainment and seldom to support learning.
In addition, in a study by Echenique (2014) university students' use of digital technologies in learning is influenced by a range of factors such as subject-specialty more than individual characteristics, differences in technology access or expertise, an observation acknowledged in a study by (Selwyn & Facer, 2014).

Objectives

The study aimed at investigating the perceptions and concerns of university students about teaching and learning through digital technologies. Although a well-researched phenomenon, little has been done with a focus on university students in developing nations (Mbengo, 2014) such as Zimbabwe. Much of the existing literature relate to the developed world with students that probably have different experiences and expectations about digital technologies from those in the developing world. For instance, Minocha (2009) examined the use of social software with respect to UK students' learning and engagement aimed at uncovering both the benefits and the challenges students experience from using the digital technologies. Little is known about how relevant the benefits and challenges are concerning the developing world context. The study thus sought to establish evidence based view about digital technologies in university education to enable university decision and policy makers to make informed future plans concerning technology enabled education since the appeal of digital technologies in universities varies with the context. On this basis, Kennedy, et al., (2006) contend that technological experiences are vital to informing university decision and policy formulation that can transform the way education is delivered. A consideration of students' technological concerns and priorities is vital since most developing countries seek to achieve quality education using scarce resources (Aiammary, 2012). Therefore, simply focusing on adopting digital technologies without proper operating model or framework can result in failure (Conole, de Laat, Dillon, & Darby, 2008) and thus deprive Universities of returns from the costly technological investments. On this premise the objective was to investigate the viewpoints of university students about integrating the digital technologies into education and assess their similarities and differences from their worldwide counterparts' perspectives reviewed in existing literature as discussed in the next section.

Related work

Despite many studies demonstrating levels and patterns of technology access and use in education, researchers are still concerned about the underutilization of digital technologies in universities (Noguera, 2015; Johnson, et al., 2013), a persisting trend since the 1990s (Dimaggio & Hargittai, 2001). For example, Echenique (2014) examined the use of new digital technologies in teaching and learning in higher

education and the findings show that in the developed world students use a variety of digital technologies and recognize their value as teaching and learning tools Conole, de Laat, Dillon, & Darby (2008) carried out a series of in-depth case studies on students' use and experience of technologies and their findings demonstrate that technology is at the heart of all aspects of university students' lives and use them to support all aspects of their learning processes. Their findings show that students find digital technological tools appropriate in teaching and learning in a variety of ways, depending on individual needs and preferences ranging from directed study, resource discovery, preparation and completion of assignments, communication and collaboration, presentation and reflection.

Corrin, Lockyer, and Bennett (2010) like Liaw, Huang, and Chen (2007), explored the learners' attitudes toward e-learning system usages, and found that learners have abundant computer related and experience in digital technologies such as the browsers and electronic mail. They then concluded that university students believe that e-learning environments are an efficient learning tool and expect teachers to satisfy their learning needs that are technology based.

The study by Jones, Blackey, Fitzgibbon, and Chew (2010) indicate that at universities there is more use of educational technologies such as Power Point, Virtual Learning Environments and Wikis. They also reveal that social networking software is valued by university students as an ideal tool that assist both the students and/educators to reflect on their learning and teaching practice.

On the contrary, an investigation by Margaryan, Littlejohn, and Vojt (2011) on the extent and nature of university students' use of digital technologies for learning and socializing and their findings show that students use a limited range of established technologies with the use of collaborative knowledge creation tools, virtual worlds, and social networking sites very low Kennedy, et al., (2006) reported that while most students regularly use established and available digital technologies such as email and Web searching tools, only a small subset of students use more advanced or newer digital technologies such as such as use of augmented reality, games and simulations.

In conclusion, from the reviewed literature is evidence that students appreciate the value of digital technologies in education. The main concern they university students have is on the limited integration of such technologies by the relevant institutions, which in turn hinders the students' technological abilities. The universities appear to have failed to set up a conducive environment that promotes students' use of digital technologies in the learning process. With this background, the subsequent section discusses the methodology used to collect and analyze data from Zimbabwean university students about their perspectives with regards to digital technologies in education.

Methodology

The research drew data from one of the sixteen universities in Zimbabwe. The choice of this university case was influenced by the institution's mission to produce technologically competent human resources and a workforce that is compliant with the current digital society' labor market requirements. A survey method was

employed where one hundred questionnaires were administered to both full time and part time students. A response rate of 84% was achieved, with eighty-four questionnaires returned and eighty-two questionnaires having clean data after two of the returned questionnaires were discarded for incomplete data entries and outliers. The survey questions were designed on the background knowledge that students' use of digital technologies is normally influenced by digital technology affordability, availability and accessibility. In addition, other questions sought to establish the demographic data, students' digital skills and competence, level of education, subject area and mode of study. The questions were easy to answer as students were mainly required to choose answers provided in the form of a 5 point Likett scale. There were only few open ended questions for further elaboration. The collected data was analyzed using the Statistical Package for Social Sciences (SPSS) and the subsequent findings were obtained.

Findings and Discussion

Through our investigation, we got the underlying findings towards answering the questions asked in the preceding section. Regarding the question on the perspectives of students about the use of digital technologies in the teaching and learning, we found that the students valued technology based teaching and learning very much. They revealed that digital technologies are convenient and flexible tools that could enhance their learning and improve their academic performance especially students enrolled in the business and engineering programme as depicted in Figure 1 and Table 3. The students found them valuable for both communication and retrieving course content material. However, the students expressed dissatisfaction with the service provision of IT infrastructure, campus computers, bandwidth and Wi-Fi.

The students also condemned lecturers for their irregularity in using the implemented LMS tools, which they felt deprived them of the affordances from the digital technologies which are currently enjoyed by their counterparts in universities in the developed nations. This is in alignment with the observation by Kolikant (2010) that both learning institutions and the educators have failed to build on the students' technological abilities This is contrary to findings in Paul, Baker, and Cochran (2012) showing that academic institutions and faculty are increasingly using social networking sites, such as Face book and LinkedIn, to connect with current and potential students and to deliver instructional content. Table 2 is a representation of the low uptake of the electronic learning system currently deployed at the institution, which can be attributed to underutilization by the lecturers. Below is an extract of students' views in this regard that are further represented in Table 3 and figure 1 respectively. One student responded to a discontentment with the technological conditions at the university by saying that: "*The institution is depriving us from using and embracing the technologies by slow internet speed "*

Another commented on the benefits drawn from digital technologies in education as follows:*"It is of paramount importance because reading a hardcopy textbook is harassing than reading a soft copy at times due to poor network connections, this may lead to use of digital technology not being seen as helpful "*

Table 2 E-learning portal by Subject area

"Subject Area specific use of the institution's e-learning system			portal			Total
			Not Useful	Somewhat useful	Very Useful	
Subject Area	Engineering	Count	6	2	17	25
		% within Subject Area	24.0%	8.0%	68.0%	100.0%
		% within portal	23.1%	22.2%	34.7%	29.8%
		% of Total	7.1%	2.4%	20.2%	29.8%
	Languages, Education	Count	3	2	5	10
		% within Subject Area	30.0%	20.0%	50.0%	100.0%
		% within portal	11.5%	22.2%	10.2%	11.9%
		% of Total	3.6%	2.4%	6.0%	11.9%
	Natural Sciences	Count	4	0	1	5
		% within Subject Area	80.0%	0.0%	20.0%	100.0%
		% within portal	15.4%	0.0%	2.0%	6.0%
		% of Total	4.8%	0.0%	1.2%	6.0%
	Creative Art and Design	Count	3	0	6	9
		% within Subject Area	33.3%	0.0%	66.7%	100.0%
		% within portal	11.5%	0.0%	12.2%	10.7%
		% of Total	3.6%	0.0%	7.1%	10.7%
	Business	Count	10	5	20	35
		% within Subject Area	28.6%	14.3%	57.1%	100.0%
		% within portal	38.5%	55.6%	40.8%	41.7%
		% of Total	11.9%	6.0%	23.8%	41.7%
Total		Count	26	9	49	84
		% within Subject Area	31.0%	10.7%	58.3%	100.0%
		% within portal	100.0%	100.0%	100.0%	100.0%
		% of Total	31.0%	10.7%	58.3%	100.0%

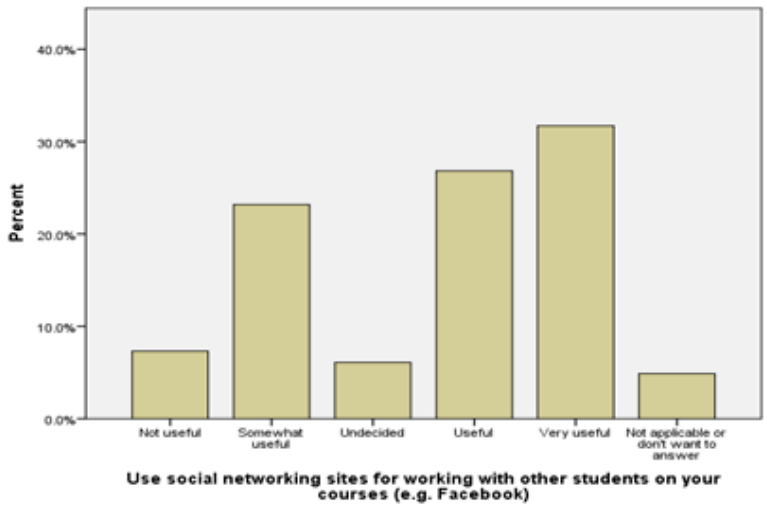

Figure 1 Digital technologies used for collaboration

Table 3 Subject Area based usability of social networking technologies

		social networking			Total
		Not Useful	Somewhat useful	Very useful	
Subject Area	Engineering	4	8	12	24
	Languages,Education	0	4	6	10
	Natural Sciences	1	1	3	5
	Creative art and Design	0	2	7	9
	Business	5	9	20	34
Total		10	24	48	82

Table 4 Students' perceptions about digital technologies in education

	Not useful	**Somewhat useful**	**Undecided**	**Useful**	**Very useful**	**Not applicable or Missing value**
	%	%	%	%	%	%
Internet search engines	0.0%	3.7%	0.0%	24.4%	63.4%	8.5%
Search for journals	2.4%	7.3%	3.7%	26.8%	52.4%	7.3%
Use recordings or videos area of study	4.9%	11.0%	4.9%	26.8%	48.8%	3.7%
Use social networking sites students on your courses (e.g. Face book)	7.3%	23.2%	6.1%	26.8%	31.7%	4.9%
Wikipedia	7.3%	15.9%	3.7%	31.7%	30.5%	11.0%
Web-based bibliography tools	6.1%	18.3%	4.9%	36.6%	23.2%	11.0%
Use web-based document (e.g. Google Docs)	3.7%	15.9%	4.9%	35.4%	36.6%	3.7%
Free educational content (e.g. i-Tunes)	7.3%	19.5%	2.4%	29.3%	35.4%	6.1%
Twitter	31.0%	26.2%	7.1%	10.7%	11.9%	13.1%

Tables 3, 4 and Figure 1are an indication of the usefulness of digital technologies to the students. Of most priority to the students' learning are the search engines used as the primary source of information. 60% of the surveyed students also confessed to using YouTube to both share and lectures notes from sources eternal to their institution. Table 5 shows that research activities are the fundamental purpose for technology use with 89% of students for the idea. These results can be attributed to the flexible bring your own device (BYOD) practice where students are free to use their digital devices and software within the institutional premises.

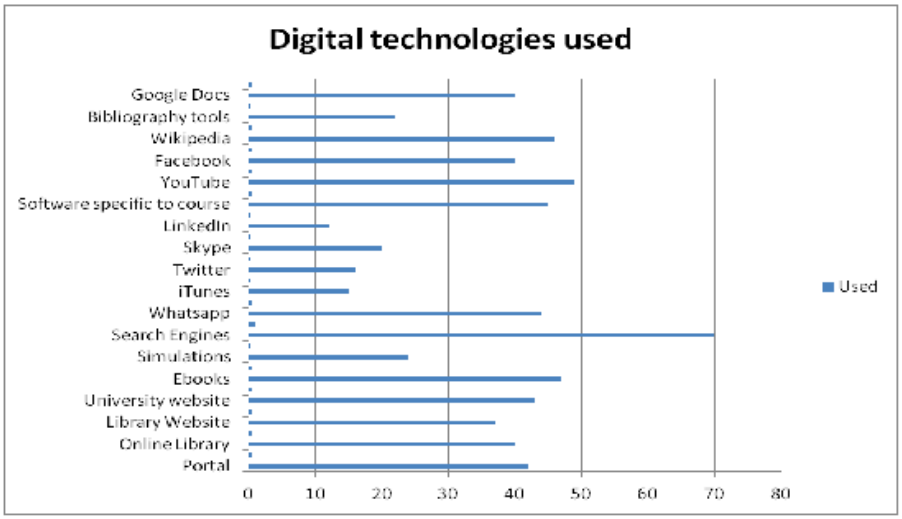

Figure 2 common digital technologies among students

Figure 2 concurs with the findings that the students are very aware of the digital technologies at their disposal for use in the learning practice. Interestingly, though, the use is concentrated on a limited selection of these technologies such as search engines at 70 %. Social media like twitter, Facebook and WhatsApp have limited use in academia probably due to the idea of separating the learning from social activities.

Table 5 Table 5 Common uses of digital technologies among students

Variable		Number	Percent
Find Information	no	9	10.7%
	yes	75	89.3%
Audios and Videos	no	23	27.4%
	yes	61	72.6%
Insert citations	no	59	70.2%
	yes	25	29.8%
Collaborations	no	39	46.4%
	yes	45	53.6%
Free sources	no	30	35.7%
	yes	54	64.3%
Communication with Instructors	no	36	42.9%
	yes	48	57.1%
Email33	no	32	38.1%
	yes	52	61.9%
Writing Documents	no	17	20.2%
	yes	67	79.8%
Presentations	no	18	21.4%
	yes	66	78.6%
Creating videos	no	44	52.4%
	yes	40	47.6%
portal	no	15	17.9%
	yes	69	82.1%

These results demonstrate that students rather focus on digital technologies that support their learning as indicated in literature that he students' digital technology preferences is highly determined by both task completion and academic performance. For instance, in Figure 3, simulation technologies are mostly used by the students

enrolled in the engineering courses as they find them handy in completing their practical task unlike the arts and natural sciences students with less application.

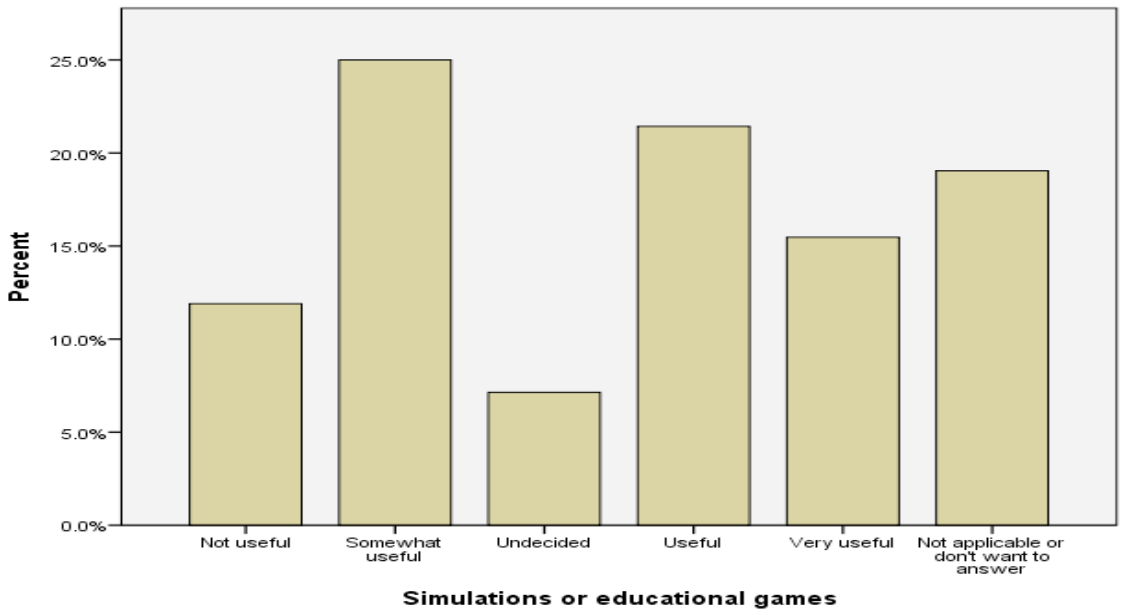

Figure 3 Course related technology preferences

These findings also show that the university students digital technology preferences are dependent on the capability to multiprocessing and discovery-based learning. Our research findings are contrary to the contention in literature that use of digital technologies by students is mostly influenced by age, giving rise to the digital natives and immigrants debate. According to this research, there are minimal differences in digital technologies usage across age. However, it seemed gender shaped the use of certain digital technologies such as social networks and library websites.

Our findings also reveal that availability, accessibility and affordability were not the major determinants of using the digital technologies in the learning practice. For example, Figure 2 has evidence of the affordability, availability and accessibility of the various digital technologies to the students both personally and institutionally. However, the same Figure 2 shows a gap between access to and use of such digital technologies as Face book, twitter, google docs and WhatsApp for learning purposes. This second order digital divide is puzzling considering the widespread access, affordability and availability of such technologies to the students' disposal. More so the uptake of such digital technologies as iTunes, Web-based e-learning portal and the citation tools are not as common among the surveyed Zimbabwean university students they are to their counterparts in the developed nations. This is evidenced by the 2.111 coefficient against a 0.184 value for twitter technology. It can thus be concluded that the popularity of any digital technology is rather consistent with environmental and institution contextual settings than the general notion of age as stipulated in Prensky (2001).

Consequently, the current second order digital divide existent in higher education environments in Zimbabwe could be attributed more to the institutional context than either technological and individual human characteristics. This is based on the observation by Kennedy, et al., (2006, p. 413) that "Universities are still ill equipped to educate a new generation of learners whose sophisticated use of emerging

technologies is incompatible with current teaching practice" The contribution from this research is therefore to inform both the university management and policy makers to develop ICT policies that facilitate the use of all the affordable, available and accessible digital technologies to both improve and enhance students' learning and academic performances. The full utilization of the available and accessible digital technologies is bound to prepare the current generation of university students for survival in the current digital society. Furthermore, it will equip these students with the digital skills required in the 21st century labor market. It is therefore the duty of the university management and policy makers to ensure that their students neither lag behind nor are deprived of the digital technology affordances currently enjoyed by the students attending university in the developed nations. The institutions need to devise the technological implementation models that encourage a wide embrace of digital technologies for teaching and learning by both educators and students respectively. By so doing, the universities will also realize the returns from the costly technological investments.,

Conclusion

Through this research, it was clear that the both the institutions and students can afford and access available digital technologies that can be embraced in the teaching and learning practice. Nevertheless, a second order digital divide persists in the Zimbabwean learning institutions. Despite the widespread access to several digital technologies, a gap still exists in the full utilization of such technologies in education, a situation that both deprives students of the needed skills for survival in the information rich society and robs the institutions of the returns from the costly technological investments. There is therefore a need for the learning institutions to channel their resources towards the facilitation of an increased utilization of both the existing and future digital technology investments.

Despite these findings being based on a single university case in Zimbabwe, the results have an implication on learning institutions of similar situations where a paradox of the second order digital divide exists. For a more informed view on the students' perceptions about digital technologies, future studies can focus on multiple cases with a longitudinal background to enable the provision of a more generalizable view that represents the perceptions of the students across institutions and environments. In addition, such studies should also incorporate both quantitative and qualitative data for the presentation of both valid and reliable results

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