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RESEARCH ARTICLE

Unraveling the Influence of Modern Technology on Generation Z's Educational Contentment in Malaysia

Hasmida Jamaluddin [1]*, Tong Zi Qi[2], Hazlaili Hashim[3], Siti Zakiah Melatu Samsi[4]

[1, 2, 3,4]Faculty of Business, Multimedia University, 75450 Melaka, Malaysia

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***Corresponding Author:**

hasmida.jamaluddin
@mmu.edu.my

ABSTRACT

In recent years, technologies have become ubiquitous throughout society. It has a major impact on almost every aspect of our lives, and education is no exception. This research aims to investigate the impact of contemporary technologies towards Gen Z's learning satisfaction, with a focus on three factors namely learning method, learning environment and social presence. Data for this study was gathered conveniently through purposive sampling method among varsity students from various educational institutions in Malaysia. With a dataset of 200 respondents, a multiple linear regression analysis was conducted to understand the influence of contemporary technologies on student's learning satisfaction. The findings highlight the positive relationship between learning environment, learning method and social presence with learning satisfaction among Gen Z students. To promote learning satisfaction, it is essential to create a supportive learning environment that facilitates collaboration, interaction, and active participation. Educational institutions should focus on providing diverse learning methods that cater to the varied learning preferences of Gen Z students in Malaysia. This research provides an insight into the impact of contemporary technology in learning satisfaction. It can identify the specific ways in which contemporary technology affects Gen Z's learning satisfaction. By having an insight of these impacts, it provides a view for educators and policymakers that contribute to Gen Z's learning satisfaction in the context of contemporary technology. Not only that, it also could provide actionable recommendations for educators and policymakers to improve the quality of education for students.

INTRODUCTION

In recent years, technologies have become ubiquitous throughout society. It has a major impact on almost every aspect of our lives, and education is no exception. As instructional technologies continue to evolve, the use of technologies in the classroom has become common. Contemporary technologies benefits people in many ways, so the advantages of technologies in education cannot be underestimated. Technology provides students with an enjoyable opportunity to easily access information, accelerate learning, and put what they have learned into practice. First, technologies can improve student concentration (Bowen, 2012). Keeping kids motivated in class can be difficult, and teachers can use technologies to run quizzes and educational games. For visual learners, watching instructional videos is an excellent alternative to traditional learning. Not only do videos make lessons easier to understand, but they also help immerse learners and keep them focused. In addition, the enthusiasm of students to learn can also be improved. Modern students have grown up with technologies, so they are used to coexisting with technologies. Learners who are motivated through technologies can stay engaged in the course, and students who are less motivated are encouraged to find things that make their learning process easier and more fun (Godzicki, Godzicki, Krofel & Michaels, 2013).

With contemporary technology, students can collaborate and work in teams more easily. Both are essential skills in nearly every workplace setting (Abou Naaj, Nachouki, & Ankit, 2012). For example, by using cloud storage, students can easily send and access files whether at home or school. Using some apps, they can also revise or peer-review each other's work, and even work with other students from around the world. In addition, students can also study according to their habits. When students want to review the course material for a better understanding, they can view the video in the lesson plan. Alternatively, teachers can see which students are struggling with certain subjects through data generated by online activities and offer help and support. These technologies can increase the cooperation between the two. Another advantage is that incorporating technology into different learning styles helps teachers become creative in the way they teach. Some students need listening practice to make it easier for them to understand difficult problems in class so teachers can use videos or podcasts in class. On the contrary, some students prefer to use pictures to visualize what they are learning so these problems can be solved very well by technology (Gopal, Singh, & Aggarwal, 2021).

Another positive aspect of technologies is enabling students to work remotely (Gopal, Singh, & Aggarwal, 2021). Whether at home or on vacation, many educational apps allow children to continue learning outside the classroom. Educational apps are also more likely to engage students, as opposed to traditional homework. Students are also encouraged to use their initiative and self-direction. One of the most challenging aspects of traditional teaching is making sure every child is learning at the right pace. So, technology is this one step up to make sure they don't get left behind in the classroom but also enables them to explore certain topics in more depth.

Generation Z is known as Gen Z is the first true digital indigenous generation. Compared to millennials, this generation has lived through the growth of the Internet. They are at the forefront of marketing and advertising. They are simple to understand, have a lot of money, and are technologically savvy. Most Gen Z don't remember life before smartphones because they grew up in the age of flowing content and ubiquitous social media. They interact with the Internet and with others in ways that previous generations did not.

Nowadays, many Gen Z students are holding technology gadgets compared to the previous holding the textbook, notebooks, and pencil cases. Contemporary technology is vital for people to flourish in an increasingly competitive. The reform and innovation of educational means and methods promote the progress and development of education. There is a direct link between technological advancement and student satisfaction in terms of education, which reinforces growth, increases competitiveness, and supports the long-term sustainability of education. With the rise of information technology such as artificial intelligence, big data, and AR, technology intervention in education is becoming popular.

The main objective for study on student learning satisfaction is to understand the learning situation, make a comprehensive analysis of students' learning situation, and provide a reference for teachers to improve teaching methods, to better improve the teaching quality of the college, and provide students with a good learning environment. By understanding students' satisfaction with the curriculum, not only can we see the attitudes and tendencies of students' learning in school, but also reflect the performance and improvement direction of school-related work from one side. Hence, this research can lead to an increased understanding of the most influential impact that determines learning satisfaction among Gen Z.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Students Learning Satisfaction

Learning satisfaction is an important criterion to evaluate course learning and is also defined as the degree of pleasure that individuals feel (Ebner & Gegenfurtner, 2019). In addition, it is also the feeling or attitude that learners can meet their wishes and needs in learning activities or processes. The interaction between learners, the interaction between learners and teachers, and the interaction between learners and content are the three components of learning satisfaction. Interaction can act as an advance organizer, enabling

students to connect old and new knowledge to generate new meanings or frameworks. Learners interact with other learners on a reciprocal basis through various communication channels, which can increase their interest and emotion in learning the course, deepen their understanding of the content, and promote the construction of new knowledge (Hong, 2002). Therefore, if online learning can provide a platform for learners to interact with each other, learners' satisfaction with the course will be improved. Second, there are many types of learner-teacher interaction. For example, teachers evaluate, encourage, and guide learners, and learners respond to teachers. The interaction between learners and the learning content occurs when learners self-reflect on the information, knowledge, or ideas acquired in the course learning and take them as the experience gained in the course learning. In the teaching of learning, learners spend most of their time interacting with the learning content. For example, learn-related pre-class materials allow learners to preliminarily connect old knowledge with new knowledge and provide opportunities for learners to expand the depth and breadth of learning. Based on their perception and expectations of what the product will do.

Researchers with different research backgrounds have different definitions of learning satisfaction. It also directly reflects the extent to which learners' expectations are met during the learning process (Yu, 2022). After experiencing a particular event, satisfaction is the feeling of contentment and optimism; typically, these views are nebulous and abstract. (Liu & Hou, 2021). The learner's internal thoughts and attitudes regarding the learning process are what is meant by learning satisfaction, as well as the extent to which the learner's desire and need for learning are satisfied and realized. It is also the degree to which students' expectations of teachers, curriculum and teaching methods are met (Rueda, Benitez, & Braojos, 2017; Yu, Tang, Gong, Dong, & Hu, 2018). In the learning process, the wishes and needs of learners are met and realized in the learning process, which is called learning satisfaction. Positive attitudes in learning activities are "satisfactory" because they meet the learners' self-expectations, while "dissatisfaction" is the opposite. Learning satisfaction is the perception or attitude that results from engaging in an advantageous learning process that consequences learners, encourages continuous learning, and fosters positive learning attitudes, ultimately meeting the needs and expectations of everyone (Chen, Luo, Fang, & Shieh, 2018; Liu & Hou, 2021). Students' perceptions of their educational experience are reflected in their satisfaction. It can impact students' motivation, a crucial psychological factor influencing their ability to learn, satisfaction is a crucial outcome for learners (Hew, Hu, Qiao, & Tang, 2020).

2.2 Learning Method

Due to the creation of a borderless world by contemporary technology and the Internet, technology is now a valuable teaching tool and enables students to learn in a variety of ways. Because of the advancement of technology, many new learning methods are considered as new tools to guide, support and facilitate learning. The application of many learning methods plays a primary role. Social media tools like Facebook, Twitter, and YouTube provide learning tools to facilitate discussions and foster an environment of open communication and social interaction among students (Oducado, 2019; Rueda, Benitez, & Braojos, 2017)

The use of these learning methods has been positively received in the classroom. But social media remains a contentious learning tool. Game-based learning and situational learning are one of the teaching methods. The two teaching methods rarely coexist in other studies. Innovative and inspiring teaching methods are popular with students because it will increase learning satisfaction and make learning enjoyable. As a result, games should be incorporated by teachers into active learning strategies in the classroom to enhance student learning (Liu & Hou, 2021). Based on some researcher reported that many students have positive satisfaction with these online learning methods (Oducado, 2019; Hew, Hu, Qiao, & Tang, 2020; Herron, Powers, Mullen, & Burkhart, 2019; Faize & Nawaz, 2020; Mohamad, Hashim, Azer, Hamzah, & Khalid, 2020; Alharthi, Yamani, & Elsigini, 2021). Hence, this study postulates the following hypothesis:

H1：There is a positive relationship between learning method using contemporary technology and learning satisfaction among Gen Z

2.3 Learning Environment

The learning environment refers to the different physical locations, environment and culture of students' learning (Bates, n.d.). There are three categories of learning environments for students which is learning environments, family learning environment, and social learning environment. The learning environment is not limited to a classroom, but also a space for students to feel safe and supportive in the process of pursuing knowledge.

In this age of innovation and technology, online learning is the trend. Online learning is primarily accomplished through virtual contact with designated teachers via electronic teaching tools such as chat, web conferencing, digital whiteboards or web videos (Baber, 2020); (Herrador-Alcaide, Hernández-Solís, & Galván, 2019). Typically, computers, tablets, and smartphones can support these. Some researchers found that students are satisfied with online learning environment (Herrador-Alcaide, Hernández-Solís, & Galván, 2019); Baber, 2020; Kangas, Siklander, Randolph, & Ruokamo, 2017; Fatani, 2020). Students are comfortable with a learning environment that suits their preferences, their learning satisfaction increases (Wongwaikit, Panjaburee, Srisawasdi, & Seprum, 2020). Through the online learning environment, students can have autonomy to control their study time, and their study and work can be better balanced. It provides a very friendly environmental factor (Baber, 2020; Bali & Liu, 2018). Hence, the following hypothesis is postulated:

H2：There is a positive relationship between learning environment provided by contemporary technologies and learning satisfaction towards Gen Z

2.4 Social Presence

Social presence is the perception of interpersonal relationships created when students and teachers interact in an online environment (Poquet, et al., 2018; Richardson, Maeda, & Caskurlu, 2017; Wijaya, Suzanna, Utomo, & Adnizio, 2021). Social presence connects students with teachers and other learners in distance learning ability and feel emotionally connected to each other (Natarajan & Joseph, 2022; Jaradat & Ajlouni, 2020; Law, Geng, & Li, 2019). Social presence is the extent to which learners experience sensations, perceptions and responses in online environments. Social presence includes five parts, social respect, social sharing, open mind, social identity and intimacy (Wijaya, Suzanna, Utomo, & Adnizio, 2021; Stankovska, Dimitrovski, Ibraimi, & Memedi, 2021). Intimacy and immediacy are factors of social presence. Examples include eye contact, physical proximity, intimacy of the topic (Oyarzun, Barreto, & Conklin, 2018).

Social presence has been shown to affect student learning various factors in the experience. Examples include student engagement, motivation, teacher satisfaction, actual and perceived learning, curriculum design, retention and academic performance (Poquet, et al., 2018; Richardson, Maeda, & Caskurlu, 2017). When online learners' social presence is high, their satisfaction is also high. Learners with high social presence have high perception of learning and high satisfaction with teachers (Jaradat & Ajlouni, 2020). Hence, this study postulates below hypothesis:

H4: There is a positive relationship between social presence in contemporary technologies and learning satisfaction.

3. METHODOLOGY

As the focus on this study is to examine the contemporary technology impact on Gen'Z learning satisfaction, hence the target population for this study is Malaysian varsity students at the age of 18 to 28 years old as describe those born between the late 1990s and early 2010s. The online survey was distributed among university students in Malaysia through a convenient and purposive sampling method. This method was chosen considering the difficulty of getting the list of students from the authorized parties and the target respondents is Gen Z. The survey was conducted in the period of May until July 2023. At the end of the survey period, a final total of 200 data sets had been gathered and used for data analysis.

The questionnaire consists of twenty items to measure three independent variables and one dependent variable. The variables are learning method, learning environment, social presence and learning satisfaction. The items used in this study were adopted from previous studies. Five-point Likert scales, with a range of strongly disagree, disagree, neutral, agree, strongly agree, were used to evaluate the questionnaire.

Data from this survey were analyzed using SPSS statistical software version 29. With a final 200 data from respondents, the reliability, correlation and multiple linear regression analysis was used to test the model and hypothesis of this study and its result is discussed in the following section.

4. RESULTS AND DISCUSSION

Table 1 below shows the demographic profiles of the respondents.

Table 1: Respondent's Profile

Characteristics	Frequency	%
Gender		
Female	107	53.5
Male	93	46.5
Age		
18-21 years old	52	26
22-25 years old	118	59
25-28 years old	30	15
Race		
Chinese	173	86.3
Indian	14	7
Malay	13	6.5
Educational Level		
Bachelor Degree	97	48.5
Diploma	43	21.5
Foundation	25	12.5
Postgraduate	35	17.5
Educational Institutions		
Multimedia University (MMU)	127	63.5
National Taiwan Ocean University	1	0.5
Sunway University	14	7
UCSI University	20	10
Universiti Malaysia Sabah	1	0.5
Universiti Teknikal Malaysia (UTeM)	7	3.5
Universiti Tunku Abdul Rahman (UTAR/TARUC)	29	14.5
Universiti Pertanian Malaysia	1	0.5

*Respondents (n=200)

The respondents in this study comprised of 93(46.5%) male and 107(53.5%) female. Most of the respondents come from the 22 to 25 years old age group (59%), followed by the age group of 18 to 21 years old (26%) and age group 25-28 years old (15%). A total of 173(86.3%) of the respondents are Chinese, 14 (7%) are Indian and 13(6.5%) are Malay. Most of the respondents are currently pursuing their bachelor's degree (48.5%) and diploma (21.5%). Respondents of this study comes from eight different educational institutions namely Multimedia University (63.5%), National Taiwan Ocean University (0.5%), Sunway University (7%), UCSI (10%), Universiti Malaysia Sabah (0.5%), Universiti Teknikal Malaysia (3.5%), Universiti Tunku Abdul Rahman (14.5%) and Universiti Pertanian Malaysia (0.5%).

Table 2: The Reliability Test and Descriptive Statistics of Variables

Variables	No of Items	Cronbach's Alpha	Mean	Std Dev
Learning Satisfaction	5	.940	4.26	.965
Learning Method	5	.929	4.23	.988
Learning Environment	5	.946	4.14	1.045
Social Presence	5	.969	3.99	1.243

As shown in Table 2, the result of reliability analysis for this test demonstrates that the Cronbach Alpha coefficient of all the four variables above 0.90. Hence, the measurements used for this study demonstrate the internal consistency of all variables. This table also shows that the mean for learning satisfaction is 4.26 with standard deviation of 0.965. The highest mean among the three independent variables is Learning Method with value of 4.23 and standard deviation of 0.988

Table 3. The Results of the ANOVA and Regression Model

ANOVA Result	Sum of Squares	df	Mean Square	F-value	Sig
Regression	116.544	4	29.136	169.354***	< 0.001
Residual	33.548	195	0.172		
Total	150.093	199			
R-Square	0.776				

Regression Model	Coefficients	Beta	Std. error	t-value	Sig
Constant			.176	4.309	<0.001
Learning Method	-.758		0.068	2.530	0.012
Learning Environment	0.496	0.173	0.061	7.438	<0.001
Social Presence	0.275	0.496	0.047	4.161	<0.001
	0.208	0.267			
Note: Dependent variable: Learning Satisfaction					

Table 3 presents the model summary of the study, indicating an adjusted R-square value of 0.776. The R-square value is a measure of how much of the variation in the dependent variable can be explained by the independent variables in the model, expressed as a percentage. Hence, from the result of the R-square value, it represents there is 77.6% of Learning Satisfaction can be explained by the three independent variables which consists of the Leaning Method, Learning Environment, and Social Presence. Table 3 also presents the results of the ANOVA analysis, which reveals an F-statistic of F (4, 195) = 169.354, with a p-value of <.001. Since the p-value is less than 0.05, these results indicate that the model is fitting the data significantly and that the relationship between the variables is linear.

These results also demonstrate that the significant value (p-value) of Learning Environment (LE) and Social Presence (SP) are below 0.001, while Learning Method (LM) is 0.012. Therefore, the hypotheses related to Learning Method (H1), Learning Environment (H2), and Social Presence (H3) are supported based on the data.

5. CONCLUSION

This research aims to investigate the impact of contemporary technologies towards Gen Z's learning satisfaction. The findings reveal that learning method, learning environment and social presence provided by recent advance technology used in the classroom has contributed towards learning satisfaction among Gen Z students.

Among all variables, the learning environment created by new technologies has the highest influence on learning satisfaction among Gen Z students. This shows that, learning environment provided by new technologies can serve as a motivation for students to develop their critical thinking skills and can facilitate their ability to learn and adapt to new things. When students feel comfortable and positive in their learning environment, they are more likely to be engaged and focused on their studies. Besides that, Baber (2020), Kay & Pasarica (2019), Bali & Liu (2018) found that students tend to perform significantly better in online learning environments when compared to traditional learning methods. This is due to the convenience and time-saving nature of online learning, which allows students to efficiently manage their time.

Besides that, the result of this study found that Gen Z students are more contented with their study when using recent new technologies such as social media, game-based learning, online tools and many more. Due to COVID-19, there has been a surge in the adoption of online learning frameworks as multifunctional platforms for teaching and learning, not only as a response to the current situation, but also as a trend that is likely to continue beyond the pandemic.

Results of this study also indicate a significant relationship between social presence and learning satisfaction, which is consistent with the findings of previous studies such as Stankovska, Dimitrovski, Ibraimi, & Memedi (2021), Richardson, Maeda, & Caskurlu (2017), Jaradat & Ajlouni (2020), and Poquet, et al. (2018). These authors found that when online learners' social presence is high, their satisfaction is also high. Not only that, but it is also crucial for instructors of online courses to prioritize the social presence of online learning to ensure student satisfaction. The shift to online learning has caused many students to lose motivation and experience stress, which could potentially result in higher dropout rates. However, by improving social presence, it is possible to reduce the sense of loneliness among students and foster greater interaction between students and teachers.

Based on this research, it was found that learning method, learning environment, and social presence having the positive relationship towards the Malaysia Generation Z's learning satisfaction. Nowadays, educational institutions should focus on providing diverse learning methods that cater to the varied learning preferences of Gen Z students in Malaysia. This could include incorporating a mix of traditional classroom-based teaching, online learning platforms, multimedia resources, and interactive activities. Offering a range of learning methods can enhance engagement and satisfaction among students, as it allows them to choose the approach that best suits their individual learning style.

Next, to promote learning satisfaction, it is essential to create supportive learning environments that facilitate collaboration, interaction, and active participation. Educational institutions should prioritize the design of physical and virtual spaces that foster engagement and provide opportunities for peer learning, group discussions, and meaningful interactions with instructors. A positive and inclusive learning environment can contribute to higher levels of satisfaction among Gen Z learners in Malaysia.

Finally, given the positive relationship between social presence and learning satisfaction, educational institutions should emphasize the integration of social elements into the learning experience. This could include promoting collaborative learning activities, incorporating group projects, fostering online communities or discussion forums, and facilitating interactions between students and instructors. By enhancing social presence, institutions can create a sense of belonging and engagement, leading to higher levels of learning satisfaction among Gen Z students in Malaysia.

This research provides an insight into the impact of contemporary technology in learning satisfaction. It can identify the specific ways in which contemporary technology affects Gen Z's learning satisfaction. By having

an insight of these impacts, it provides a view for educators and policymakers that contribute to Gen Z's learning satisfaction in the context of contemporary technology. Not only that, it also could provide actionable recommendations for educators and policymakers to improve the quality of education for students. Overall, this research could contribute to understanding of the intersection of technology and education and provide valuable insights for improving educational outcomes to the learning aspect.

Authors Contribution

HJ conceived the main idea, wrote and compiled the whole manuscript. TZQ designed the idea and performed the statistical analysis. HH and SZMS helped with the proofreading the manuscript and gave idea on how to improve it further. All authors read and approved the final manuscript.

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