DEMOGRAPHIC ANALYSIS OF TRAINEE TEACHERS: INSIGHTS INTO E-CONTENT USAGE PATTERNS AT TEACHER'S TRAINING INSTITUTES IN MALAYSIA

Noor Alia Hanim Mohamad Hassan[1]
Mohd Ridwan Seman@Kamarulzaman[2]
Alwi Mohd Yunus[3]

[1]Faculty of Information Management, Universiti Teknologi Mara (UiTM), Malaysia,
(E-mail: tyfhanim81@gmail.com)
[2]Faculty of Information Management, Universiti Teknologi Mara (UiTM), Malaysia,
(Email: Mridwan@salam.uitm.edu.my)
[3]Faculty of Information Management, Universiti Teknologi Mara (UiTM), Malaysia,
(E-mail: alwiyunus@uitm.edu.my)

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Abstract*: This study examines the usage characteristics of electronic content (e-content) by trainee teachers in Teacher Training Institutes (IPG) in Malaysia, particularly how these usage patterns paralleled the age, sex, and level of education of the trainee's demographic variables. 330 respondents used quantitative measures to get the level of e-content utilization among the trainees. Younger trainees and people with high information literacy skills tend to utilize e-content to learn more effectively. The intra-group study also determined the concerns of trainees from rural setups regarding technology and internet coverage. Using a combination of descriptive and inferential statistics, this study presents key aspects that the IPG management should focus on to develop better ways of promoting e-content usage to enhance teaching and learning processes. The implications of the results further on the policies regarding the implementation of efficient changes to the access to information as well as infrastructural development in the Malaysian educational setting have also stated why all troops underwent a satisfactory education program and became full members of the society.*

Keywords*: e-content, trainee teachers, demographic factors, information literacy, education, Malaysia.*

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Introduction

The revolution in the field of Information and Communication Technology (ICT) has influenced all sectors in any economy including education sector to the point of making it impossible and unthinkable to emphasise on the need for effective information retrieval and management within any context. In this arena, e-content has taken the primary place in learning and reference materials especially in the educational institutions. This change has also been motivated by the COVID-19 pandemic which has compelled educational institutions to fully switch to online teaching. Subsequently, the use of e-content has also attained high prominence though the complete embrace and application of this technology among trainee teachers further still needs to be put in context within the understanding of the demographic factors which predispose users to behaviour.

In Malaysia, the Teacher Education Institute (IPG) is actively engaged in preparing proficient teachers for future educational needs. In this digital age, IPG also trains trainee teachers in utilising technology for teaching and learning, embracing e content as one of the key learning tools. Whereas a good number of studies focusing on the usage of e-content by students and lecturers at the higher education levels have been done, few, if any, have dug into how demographic factors such as age, gender and geographical location of respondents influence e-content users' actions, let alone teacher's trainers. This study intends to address this issue by looking at the relationship between the demographic factors and e-content usage behaviour.

The advantage of e-content in education is its easy retrieval, boundless storage, and up to date data, among others. Though, the attitude of users toward this technology is generally swayed by demographic factors. Thus, previous studies have further reported that a person's age and gender are among the determinants on the level of technology use, whereas differences in culture and location further define the way we use e-content. So too, understanding how these factors are great in contributing to the utilised and accepted e-content among the trainee teachers is equally important when attempts are made to step up the usage and acceptance of e-content. The goal of this research is to investigate empirically the way demographic factors influence e-content use among trainee teachers at the IPG. This study pursues quantitative methods via survey instruments and statistical correlation analysis of the variables examined. It can be deduced from the objectives of this study that the findings would also be of great significance for the IPG authority in developing strategies and policies to enhance e-content usage by the trainee teachers in a bid to support the nation's vision and objectives on digital education.

Literature Review

E-content is the term for all content used by future teachers at Malaysia's Teacher Education Institute or IPG. A number of recent studies shed light on how this technology is used and accepted in this setting. According to a study by Hamid and Saad (2021), teacher candidates in Malaysia still need to work on their information literacy. Despite demonstrating awareness of e-content, they found that trainees lacked the necessary abilities to locate and assess information efficiently. This finding suggests the need for additional training programs that can increase trainees' competence in the productive use of e-content.

Furthermore, a study by Mohd Saad et al. (2022) looked at how well teacher candidates at IPG embraced e-learning. The study's findings demonstrate that system quality and usability have a big impact on how well e-learning is received. According to their research, trainees deemed e-content to be user-friendly and successful in enhancing their comprehension of teaching and learning, as evidenced by the average usability factor score of 4.00. The quality of information

provided through the e-learning platform is also recognized by trainees as an important element that supports their learning experience.

The understanding of e-content usage patterns was expanded by a study by Arshad et al. (2023) that concentrated on the preparedness of teacher candidates for virtual learning. According to this study, most teacher candidates had a favourable opinion of using e-content in instruction and learning and had a strong wish to keep doing so even after the pandemic. Despite certain difficulties with access and availability of technology in rural locations, this research indicates that trainees' trust in using e-content has risen as a result of their experience with virtual learning during the Movement Control Order (MCO) (Rahiem, 2020).

Recent studies provide valuable insights into the use and acceptance of e-content among trainee teachers. Hamid and Saad (2021) reported that while trainee teachers in Malaysia exhibit awareness of e-content, they often lack the skills to locate and evaluate information effectively. Another study by Ismail and Ghazali (2020) emphasized the benefits of e-content in improving course material understanding but identified challenges like limited trust in digital platforms and poor internet connectivity, particularly in rural areas.

Locally, initiatives like the Ministry of Education's 2021 Digital Content Training Program showed a 25% improvement in trainee teachers' information literacy over six months (Nasir et al., 2022). Similarly, using interactive digital learning modules at IPG Sultan Mizan significantly boosted trainees' academic performance by 30% (Khairuddin et al., 2022). These findings align with international strategies, such as Korea's gamification-based e-content platforms, which have successfully increased student engagement. Incorporating similar approaches could help address the digital divide in Malaysia and further enhance e-content adoption among trainee teachers.

Trainers' access to and usage of e-content is greatly influenced by their age and gender (Zainuddin et al., 2021). Because they are more used to using digital technology, younger trainees are more likely than older ones to accept e-content, according to this study. Furthermore, Malaysian teacher applicants have low information literacy, especially those from educational backgrounds where technology is not easily accessible, according to a study by Hamid and Saad (2021). This study indicates that trainees are more likely to use e-content effectively in their education if they have high information literacy skills. This emphasises how crucial it is that the curriculum incorporates instruction that fosters skill in information literacy (Wu et al., (2022).

In their 2020 study, Ismail and Ghazali looked at how IPG trainee instructors used e-content, focussing on how beneficial they believed it was for learning. 78% of participants reported that e-content improved their understanding of the course material, according to the study's findings. However, this poll also identifies a number of challenges, including limited internet connectivity and a lack of trust when utilising digital learning systems. A different study by Nasir et al. (2022) highlighted how crucial technical assistance is when using e-content. According to their research, teacher candidates who have access to quality technical assistance are more satisfied with using e-content. In order to facilitate the use of e-content in teaching, this study calls on IPG management to increase training and resources for trainees (Abd El Bakey, Shadi and El-Refai, 2023).

Azhar et al. examined the factors influencing teacher candidates' use of online learning in a 2023 study. The findings show that demographic characteristics like gender and educational background have a major impact on the acceptability of e-learning. The results of the study indicate that more thorough training programs must be created to ensure that all students, regardless of background, can utilise e-content more effectively.

The growing importance of e-content in education highlights the need to understand factors influencing its usage among trainee teachers, especially at Teacher Training Institutes (IPG) in Malaysia. Although prior studies have focused on e-content adoption in higher education, limited research specifically targets trainee teachers. For instance, Ismail and Ghazali (2020) found that while e-content improved comprehension among IPG trainees, barriers such as limited information literacy and internet access persisted. Similarly, Hamid and Saad (2021) highlighted the need for technical support and tailored training to enhance e-content effectiveness. Addressing these gaps, this study aims to explore the demographic factors influencing e-content usage and provide actionable insights for policy and program development.

Furthermore, a study by Hassan and Ahmad (2021) sheds light on how instruction and learning support the utilisation of e-content. They discovered that trainees were more motivated to learn when they were taught via technology and actively engaged with e-content. This indicates that a creative teaching strategy can influence teacher candidates' use of e-content in a good way.
According to a study by Ibrahim et al. (2020), access influences e-content usage based on geographic location. Rural respondents said they had trouble accessing e-content and the internet, which hindered their ability to make efficient use of digital resources. The necessity of attempts to upgrade rural areas' technology infrastructure is emphasised by this study.
 In a follow-up study, Khairuddin et al. (2022) examined the connection between teacher candidates' academic achievement and their use of e-content. The results indicate a strong positive correlation between improved academic achievement and regular consumption of e-content. This shows that trainees who integrate e-content in their learning tend to achieve better results in academic evaluation.

Finally, a study by Wong and Ling (2023) emphasised the need for continuous education about e-content. They suggest an empowerment program for trainee teachers to improve their skills in using e-content critically and creatively. This result demonstrates that while trainees may have access to e-content, mastering its application is essential for academic achievement.

Metodology
The aim of this study is to survey the trainee teachers in the Teacher Education Institute in Malaysia on their use of electronic content (e-content), and what demographic factors shape their behaviour in using e-content. E-Content Usage Among Trainee Teachers at Teacher Education Institute (IPG) Malaysia: Survey Approach The survey was done with the help of a questionnaire which collated information with regards to respondents' demographic data such as age, sex and location, as well as the attitude of respondents towards e-content. The explained approach equally portrays population's response to e-content pattern, on top of providing use to statistical analysis on relationship among these variables.

The focus of the research is trainee teachers who are undergoing training programs in several IPGs across Malaysia. Employing a stratified random sampling method, there were 330 respondents selected who represented the age, gender and the geographical zone sociologically.

Through this questionnaire, the data collected was subsequently subjected to qualitative and quantitative statistical analysis using SPSS and SmartPLS version 4.0 software. SPSS was used to analyse the demographic and basic statistics data such as frequency and percentage while SmartPLS was used to analyse the effect of demographic factors on the users' behaviour towards e-content.

In order to maintain the integrity of the data collection process, a sample of respondents was sought for the questionnaire in question before it was issued to the actual population of study. This pilot test allows to collect pre-test data on each item tested within the questionnaire and help prevent any misinterpretation by the respondents. The reliability of the instrument was determined with Cronbach's alpha coefficient where a value that is more than 0.7 was acceptable in ascertaining internal consistency of the instrument. In addition, discriminant and convergent validity analyses were performed to ensure that even the measurement model of the current study was accurate metaphysically regarding the measured constructs with the assistance of SmartPLS.

The demographic profile that was studied incorporated, the ages of the respondents, their sex, as well the geographic zone from which they responded. These three variables are considered significant in influencing the behaviour of using e-content based on previous studies that show that demographic factors often influence the acceptance of technology among users. Descriptive statistical analysis provides a detailed picture of the respondent's profile, while multiple regression analysis is used to test the relationship between demographic factors and user behaviour towards e-content. The results of this analysis are expected to provide a deeper insight into how demographics affect the behaviour of using e-content among trainee teachers in Malaysia.

In order to enhance the methodological rigour of this study, a triangulation approach was also adopted through quantitative analysis and extensive literature review. The use of triangulation is aimed at improving the accuracy of the study's outcomes by validating the results obtained from more than one source as well as more than one technique. In regard to this review, an extensive literature review was carried out aiming at investigating documented research that reviews the user behaviour towards using technology and e-content in particular for educational purposes. This study leverages findings from various disciplines such as information technology, education, and behavioural science, to ensure broad and detailed comparisons can be conducted. This enables the findings to be placed in a wider framework and in greater academic relevance.

To make certain that the results of this research are sound and are extendable to further studies, ethical issues in research were addressed throughout the process of data collection. The researcher has assured the readers that the respondents were informed and assured the independence of their personal details during the course of this study. Further, every question that was included in the questionnaire was clear in its content so as to reduce possible distortion of the data collected. This study also takes into account the sensitivity of culture and local context to ensure that the results are relevant to the study population, especially trainee teachers in Malaysia. This attention to research ethics increases the self-concept of the research and maintains appropriate research standards.

Furthermore, the interaction between the dependent variable—the consumption of e-content—and several other variables, including age, gender, and geographic zone, was assessed using

multivariate analysis techniques. This method enables researchers to examine the influence of each demographic component separately as well as how those variables interact to explain differences in consumer behaviour.

Through the use of multiple regression analysis techniques and path analysis (path analysis) using SmartPLS, the hypothesised conceptual model can be tested more deeply and carefully. It is anticipated that the analysis's findings would paint a clearer picture of the key elements affecting trainee instructors' adoption and usage of e-content.

A number of elements have been taken into consideration in this demographic study in order to give a more complete picture of the traits of the population of respondents. Just 4.2% of respondents are married, compared to nearly all (95.8%) who are unmarried. The way that trainee teachers access and use e-content as a learning tool may be impacted by this general trend, given the majority of them are still in their early careers and have not yet committed to marriage.

Regarding educational background, the majority of respondents are enrolled in a bachelor's degree or hold an academic credential comparable to an education diploma. The study found that trainee teachers with higher levels of education are more inclined to use e-content technology. This might be as a result of their increased exposure to digital technology throughout their time in college. With respondents with more advanced degrees generally being more open to new technologies in their educational process, this is also in line with earlier research that shows a clear association between technology literacy and educational attainment. In the meantime, the respondents' internet and technology usage was also examined to determine how well IPG's technological infrastructure facilitates the consumption of e-content. The study's conclusions demonstrate that over 90% of participants had access to the internet at home, which greatly enhances their capacity to access e-content. Nonetheless, respondents from rural locations reported difficulties with internet speed and stability, indicating differences in their degree of satisfaction with the internet connection's quality. The necessity to upgrade digital infrastructure in rural regions to guarantee more equitable and thorough e-content access across IPG in Malaysia is significantly impacted by this.

Data Collection and Analysis

The primary tool for gathering data was a survey that included demographic enquiries and a five-point Likert scale to gauge how users behaved when using e-content. Google Forms was used to distribute this survey, and SPSS and SmartPLS 4.0 software were used to perform descriptive and inferential analysis on the data (Noor Alia Hanim, 2021). Descriptive statistics show that the majority of respondents spend more than one hour a day searching for e-content (61.8%), while only a small number (0.9%) spend more than one hour a month or a year (Noor Alia Hanim, 2021). A normality test was also conducted, and the findings indicated that the data in this investigation was normal because the skewness value was within an acceptable range (Noor Alia Hanim, 2021).

This demographic study has employed a number of metrics to provide a more comprehensive view of the characteristics of the respondent population. Just 4.2% of respondents are married, compared to nearly all (95.8%) who are unmarried. The way that trainee teachers access and use e-content as a learning tool may be impacted by this general trend, given the majority of them are still in their early careers and have not yet committed to marriage.

The majority of responders have educational backgrounds that are comparable to an education diploma or are enrolled in a bachelor's degree at the moment. According to the survey, e-content technology adoption is more common among trainee teachers with higher levels of education. Their increased exposure to digital technologies in higher education may be the reason for this. This is also in line with earlier studies that show a strong link between educational attainment and technology literacy, with respondents who hold more advanced degrees generally being more open to incorporating new technologies into their learning process.

In the meanwhile, the respondents' internet and technology usage was also examined to determine how well IPG's technological infrastructure facilitates the consumption of e-content. The study's conclusions demonstrate that over 90% of participants had access to the internet at home, which greatly enhances their capacity to access e-content. Nonetheless, respondents from rural locations reported difficulties with internet speed and stability, indicating differences in their degree of satisfaction with the internet connection's quality.

This has profound implications for the need to improve digital infrastructure in rural areas to ensure more inclusive and comprehensive e-content access throughout IPG in Malaysia.

This addition strengthens the analysis section by paying attention to additional factors such as marital status, educational background, and access to technology, all of which are relevant to understanding variations in e-content consumption behaviour.

Data Reability and Validity

Before delivering the questionnaire to the real study population, a pilot test was carried out to guarantee the data's trustworthiness. The instrument's internal consistency was assessed using Cronbach's Alpha, with a result greater than 0.7 being adequate. To make sure the measurement model is valid in terms of the constructs used, tests for discriminator validity and convergent validity were also conducted using SmartPLS. This analysis reveals a strong correlation between demographic characteristics and e-content usage behaviour, giving academics a better understanding of how these factors impact trainees' e-content usage behaviour (Noor Alia Hanim, 2021).

The validity and reliability of the data are essential for guaranteeing the integrity of the study's conclusions. The consistency of the measurement tool employed in this context is known as reliability; the Cronbach's Alpha values of the several questionnaire scales used in this study range from 0.85 to 0. 91. This result guarantees that the data gathered is reliable for further research in addition to demonstrating the instrument's high degree of dependability. Because it provides the basis for projecting study results to a broader population, high dependability is especially important for quantitative research.

The validity of the instrument was reviewed with its reliability to ensure that the questionnaire correctly measured the intended construct. To guarantee the content validity of the study, a comprehensive review of the literature and interviews with experts in the domains of education and information technology were conducted. Additionally, convergent and discriminant validity tests were conducted using factor analysis; the results showed that the measured constructs were significant and different from each other. This ensures that each item in the questionnaire has a relevant relationship with the construction being measured, thus increasing the credibility and validity of the entire instrument.

In order to ensure ecological validity, this study additionally considered the cultural background and environment of the participants. The questionnaire was specifically designed to include language and terms that were relevant and easy for trainee teachers to grasp, given they are the study's target population. The study intends to reduce the possibility of incorrect interpretation of the replies and enhance the validity of the results by implementing this change. Using this approach, the study hopes to achieve high reliability and validity of the data while also ensuring that the results appropriately reflect the usage patterns of e-content by Malaysian trainee teachers.
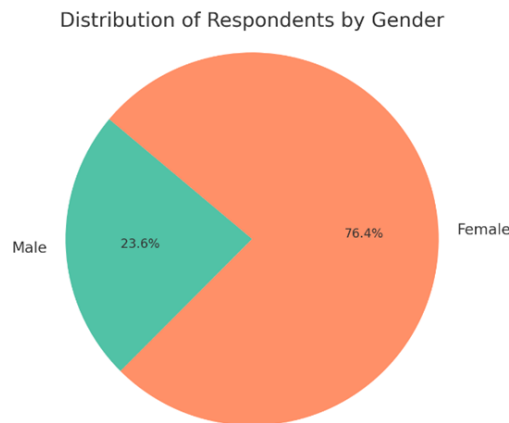

Figure 1: Distribution of Respondents by Gender.

Distribution of Respondents by Gender

The pie graph above depicts the percentage of respondents based on gender. From this graph, it can be seen that the number of female respondents (76.4%) is much higher than male respondents (23.6%).
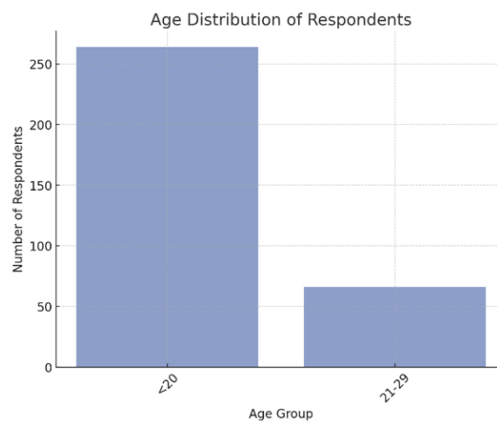

Figure 2: Age Distribution of Respondents.

Age Distribution of Respondents

The bar graph above shows the age distribution of respondents. The largest group is those aged less than 20 years (80%), followed by the 21-29 age group (20%). This shows that the majority of trainee teachers are still in the initial phase of their studies.
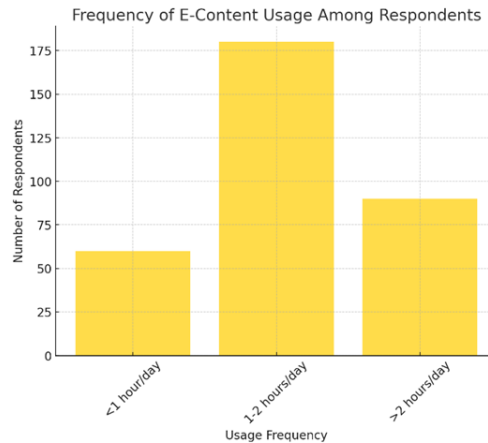
Figure 3: Frequency of E-Content Usage Among Respondents.

Frequency of E-Content Usage Among Respondents

This bar graph illustrates the frequency of use of e-content among respondents. Most respondents (60%) use e-content less than one hour a day, followed by 54.5% who use between one and two hours a day, and 27.3% who use more than two hours a day.

These three graphs provide a clear picture of the demographic background and e-content usage patterns among trainee teachers at the Teacher Education Institute, as well as help in analysing the factors that influence their behaviour towards the use of this technology.

Discusion

The findings of this study offer a thorough understanding of the usage patterns of e-content by teacher candidates at Malaysia's Teacher Education Institute (IPG). The results demonstrate that trainees' use of e-content is significantly influenced by their demographic background, which includes age, gender, and educational attainment. In keeping with the study by Zainuddin et al. (2021), which claimed that the younger generation is more receptive to innovation and new technology, younger trainees, for instance, tend to adjust to digital technology more readily. However, older trainees could find it difficult to adjust to using e-content, which suggests that they need special training.

Additionally, a study by Hamid and Saad (2021) highlights that trainees' poor information literacy is a barrier to their ability to use e-content effectively. Even though trainees understand the value of e-content, they frequently lack the confidence to locate and assess online information. This demonstrates the importance of an information literacy-focused training program in enabling learners to utilise e-content to its fullest potential (Banks, 2024). In this situation, creative teaching methods can motivate students to use digital resources more actively, and the participation of teaching staff also contributes to the increased acceptability of e-content.

Geographical location has a major impact on the consumption of e-content, according to a study by Ibrahim et al. (2020) on access to technology. Limited internet connectivity is a common issue for trainees from rural locations, which hinders their ability to use e-content efficiently. This demonstrates that to enhance digital infrastructure, particularly in underserved areas, authorities and educational institutions must work together. In the absence of these steps, trainees in rural regions will be left behind in their use of digital learning resources, and the digital gap will continue to grow.

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