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Assessing ICT Awareness and Competency among Commerce Lecturers in Malaysian Polytechnic's: A Preliminary Analysis

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Abstract
The Malaysian Higher Education Framework 4.0 is a blueprint produced by the Ministry of Higher Education, Malaysia (MoHE). This framework is referred by higher education institutions to develop their own study programs and comply with international standards and demands. Embedding elements of Information and Communication Technology (ICT) into the curriculum is commonly included in many educational frameworks today. This research conducted to measure the current ICT awareness and competency among commerce lecturers in Malaysian Polytechnic's. This preliminary research uses descriptive analysis with the mean score formula to classify the level of ICT awareness and competency. The research found that the level of ICT awareness among commerce lecturers was high, with a total mean score of 2.991. The ICT teaching pedagogy also indicated a high level, with a total mean score of 3.209. Additionally, there was a very high level of ICT competency in using web tools and applications, with a total mean score of 3.389. This research finding will contribute as input to the relevant authorities in planning their future plans based on the readiness of commerce lecturers' ICT awareness and competency.

Keywords ICT Awareness, ICT Literacy, ICT Pedagogy Competency, Web Application Usage

1. INTRODUCTION

The Ministry of Higher Education Malaysia (MoHE) plays an important role in governing technology-driven education to embrace Fourth Industrial Revolution (4IR). Embedding the 4IR into curriculum was demanding years ago and it's still relevance into many educational frameworks. The 4IR pillars promoted nine technology areas include Big Data and Analytics, Autonomous Robot, Simulation, Universal System Integration, Cloud Computing, Industrial Internet of Things (IoT), Cyber Security, Addictive Manufacturing, Augmented Reality and 3D Simulation (Othman & Zaidi, 2021). To address this, the Malaysian Higher Education Framework 4.0 was produced to cope with the demands of 4IR. This framework focuses on four sectors: future-ready curriculum, research and innovation, agile governance, and talent planning (Kementerian Pendidkan Malaysia,2020). Malaysian Polytechnic's is an educational institution directly under MoHE that offers 159 study programmes across Malaysia. Focusing on the commerce area, there are 23 polytechnics and 14 community colleges providing 16 diploma and certificate programs. Embedding 4IR into the curriculum is generally associated with technical areas such as Information Technology, Health, and Engineering. However, this is not always the case. Today, all areas are exposed to and embrace 4IR technology, even if only at a surface level.

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The integration of Information and Communication Technology (ICT) in education is crucial for adapting to the demands of the 4IR particularly in Malaysian Polytechnic's. This transformation is essential for enhancing teaching and learning experiences, particularly in commerce field such as management,services and general studies. One existing study found that social science lecturers in Malaysian Polytechnic's, particularly those teaching in commerce departments, may face challenges in keeping up with the technological advancements required for their instructional duties (Shariman et al., 2012) (Hamzah et al., 2017). This study aims to assess the level of ICT awareness and ICT competency among this group of educators, with the goal of identifying potential gaps and informing strategies to enhance their ICT competencies.

2. LITERATURE REVIEW

The lack of ICT familiarity (Bin et al., 2023) and the inability to adopt technology-based education (Bin et al., 2023) were challenges faced by Malaysian educators in aligning with a 4IR-embedded curriculum. The ability to manage information, either within the computer desktop or on the web, and the ability to use communication tools, such as connecting to the internet, were basic ICT literacy indicators. An educator with proficient ICT skills is needed to utilize teaching and learning tools and resources. The integration of ICT in education has been a critical factor in modernizing teaching practices, improving learning outcomes, and bridging knowledge gaps. In Malaysian Polytechnic's, the emphasis on ICT competency, particularly among lecturers with commerce backgrounds, plays a pivotal role in ensuring the effective delivery of educational content.

ICT awareness encompasses the knowledge and understanding of how technology can be applied in educational settings. According to (Khairul Alrashid, 2017), ICT competency among lecturers significantly impacts their ability to utilize technological tools effectively in teaching. His study at Kolej Kemahiran Tinggi MARA (KKTM) and Institut Kemahiran MARA (IKM) revealed that over 90% of lecturers perceived themselves as competent in using basic ICT tools, such as word processors, search engines, and presentation software (Mohd Nawi, 2017). However, a need for systematic training to enhance ICT integration was identified. Studies have highlighted the need for digital literacy among both lecturers and students to effectively leverage ICT for teaching and learning. In the context of Malaysian Polytechnic's, research has also identified the lack of digital literacy and capacity among TVET instructors as a significant challenge in the integration of technology in teaching and learning (Chua & Jamil, 2012). For instance, a study by (Chua & Jamil, 2012) found that

TVET instructors in Malaysia often struggle with their technological pedagogical content knowledge, which is essential for effective technology integration in the classroom. Non-technical lecturers in Malaysian Polytechnic's, particularly those teaching in commerce departments, may face several challenges in integrating ICT into their teaching practices including limited training opportunities, inadequate infrastructure, and resistance to change. A research studied emphasized that these challenges are more pronounced in polytechnic settings, where lecturers from non-technical backgrounds struggle to keep pace with technological advancements (Yusof et al., 2015). The study suggested the implementation of tailored professional development programs to address these challenges.

Higher education providers are required to follow national educational standards to ensure their programs are legitimate and recognized. One of the respected bodies is the Malaysian Qualifications Agency (MQA), which provides five main guidelines: the Malaysian Qualifications Framework (MQF), the Code of Practice for Programme Accreditation (COPPA), the Code of Practice for Institutional Audit (COPIA), Programme Discipline Standards, and the Guideline of Good Practices (GGP). All these guidelines are part of the quality assurance practices to ensure that education in Malaysia meets international quality standards.(Sabtu & Ismail, 2022). The commerce programme at Malaysian Polytechnics follows four different MQA program standards as the baseline for developing its curriculum: Business Studies, Accounting, Finance, Islamic Finance and Muamalat. These four standards mention the need to infuse an ICT element topics into the knowledge areas. Malaysian Polytechnic's offer 14 diploma programs that are available in 23 polytechnic institutions.

MQA program standards for commerce discipline require ICT element topics suggest in their Body of Knowlege (BOK). Some suggestion topics are Human Resource Information System, Digital and Social Media Marketing, Consequences of IR4, Use of Information Technologies and Systems (IT&S), Computer-based accounting system and many more. All these ICT elements (Ummah, 2019) (MQA, 2013) (Asiva Noor Rachmayani, 2015) (www.mqa.gov.my, 2019) topics that embedded in the commerce program curriculum require competent lecturers to effectively teach and facilitate learning. The basic requirement for hiring a lecturer is usually based on their first degree for Malaysian Polytechnic's competency. For example, a Diploma in Marketing requires competency from graduates with a Bachelor’s degree in Marketing. Are marketing lecturers competent to teach ICT elements that includes in the course, or do they have good basic ICT awareness and ICT competency?.

This matter brings the objectives of this research within the scope of the Malaysian Polytechnic's competency for commerce department.

This literature review explores existing studies related to ICT awareness and ICT competency, with a focus on general computer literacy among non-technical lecturers. It also examines the guidelines provided by the MQA, which are referenced by higher education providers for their study programs.

3. METHODS

This preliminary research adopted a descriptive approach to investigate the insights of ICT awareness and ICT competency among commerce lecturers in Malaysian Polytechnic's. The instruments indicate three areas of ICT awareness, ICT competency in terms of teaching pedagogy, and ICT competency based on internet and web application usage. These instruments were transferred into a questionnaire format and distributed through online. The questionnaire is divided into four parts. Section A contains two items that collect demographic information about the respondents, specifically their institutions and service grades. Section B includes nine items that assess the lecturer's ICT awareness.This question adopt from previous research assesing ICT awareness for teaching healh education (Adebagbo & Adewoye, 2024) . Section C lists five items to evaluate the lecturer's ICT competency in teaching pedagogy. Finally, Section D contains five items that assess ICT competency in terms of using web and computer applications. These 2 sections, C and D adopt the previous research instrument on assesing Information and Communications Technology (ICT) Competency and Capability ((Malangen, 2022). Two simple research questions formulated in this research to provide basic validity evidence. The following question to find:

Question 1: Does the commerce lecturer from Malaysian Polytechnic’s aware on ICT

Question 2: Does the commerce lecturer from Malaysian Polytechnic’s competent in ICT teaching pedagogy and internet/web application usage.

The questionnaires were prepared using a 4-point likert-scale to determine respondents' attitudes towards ICT awareness and ICT competencies. No fixed rules to follow concerning the number of items to include in the final scale, at least four are needed for evaluation of internal consistency (Hooker, 2016). The target respondents for this study were commerce lecturers from 20 Malaysian Polytechnic’s that offer commerce diploma programs. The sample size was determined using the sample-to-item ratio technique for sample analysis, which recommends ratios of 5:1 based on the number of items surveyed. The ratio

should be no less than 5:1 (Memon et al., 2020). If the number of items is 10, the sample size should be at least 50. The total number of items for this research was 21, which complies with the 5:1 ratio recommendation, resulting in a sample size of 105. Covariance Based-Structural Equation Modeling (CB-SEM) is a widely used statistical technique for social science researchers and suggest 100 to 200 sample size is enough for a simple research model with normal data distribution. (Rahman, 2023). This research also considers the CB-SEM technique to determine an appropriate sample size. To measure the Information, Communication, and Technology (ICT) Awareness among Commerce Lecturers, the descriptive statistics of mean and standard deviation were analyzed using Statistical Package for the Social Sciences (SPSS) tools to answer the research questions. The data reliability is also measured to assess the consistency of the items, with a value above 0.7 indicating that the data is reliable using Cronbach's Alpha formula.

4. RESULTS

The analysis and insight of the data will discuss in this part. To identify the question reliability, the data analyze using Alpha Cronbach formula that must indicate high internal consistency value above .7 (α = .7). Data reliability analyze by instrument section. Cronbach's alpha showed the questionnaire to reach acceptable reliability, α = .954 for ICT awareness, α = .962 for ICT competency in teaching pedagogy and α = .958 for ICT Competency on internet and web application usage. The whole instrument indicate α = .976 value. For respondents demographic, a total of 109 respondents were from 20 institutions in Peninsular Malaysia. All these 20 institutions offers the diploma programs from commerce and management field. The respondents pull from different service grades DH41, DH44, DH48, DH52 and DH 54.

ICT awareness question item indicate the higher mean value for question 7 where the respondents hava ah highest awareness on saving and sharing computer files using a storage device, as this is a common routine when working with computers or laptops. While the question 4 shows the lower mean values, which might be due to the fact that the competency is usually carried out by ICT technicians to setup computer hardware, making it a as non-routine activity for lecturers. For teaching pedagogy ICT competency, the higher mean value was 3.44 where its indicate the routine of use scanners or cameras to import image for teaching materials as familiar routine. 3.08 mean value indicate the lower awareness on web publishing software to publish teaching materials. The final section to report was an ICT awareness on using web and application. "I can publish work on the internet specifically in

the institution websites or learning management system like CIDOS" indicate the lowest mean value with 3.27 and 'I can downloads and uploads documents from/on the internet' indicate the highest means value with 3.48.

With a total score mean of 2.991, ICT awareness among Malaysian Polytechnic's lecturers reaches a high awareness level, especially in handling and maintaining personal computer activities. A total mean score, 3.209 also indicates a high level of awareness regarding ICT competency in teaching pedagogy. Literacy is measured by how lecturers set up tools, internet connections, and websites to support pedagogy activities. The awareness level for ICT competency in web and applications is very high, with a total mean value of 3.389. The literacy measures include handling documents, web publishing, and accessing browsers.

To answer the research question 1, are the commerce lecturers from Malaysian Polytechnic's aware of ICT? The commerce lecturers from Malaysian Polytechnic's are highly aware of ICT, as indicated by a high level of awareness. For research question 2, are the commerce lecturers from Malaysian Polytechnic's competent in ICT teaching pedagogy and the use of internet/web applications? The commerce lecturers from Malaysian Polytechnic's are highly competent in ICT teaching pedagogy, with a very high level of competency in using the internet and web applications.

5. DISCUSSION

ICT awareness and literacy are crucial in today's world, not just for those with technical and ICT backgrounds. It is important for Malaysian Polytechnic's to assess competency levels and ensure alignment of lecturers competency with curriculum instructional requirements. Previous research has highlighted the challenges and impact of ICT awareness and competency. Malaysian Polytechnic's are constantly seeking alternatives to train lecturers who have not yet met the general ICT standards.

The three main ICT awareness and competency indicators reported in the previous section show that Malaysian Polytechnic's lecturers are ready to embrace the ICT working environment, including the technical processes involved in preparing ICT-based instruction and delivery. These findings indicate a positive level of ICT awareness and competency in general ICT skills. The involvement of lecturers with students in the 4IR-themed projects is a positive step in exploring the ICT environment and aligning it with the commerce area.

Malaysian Polytechnic's have different academic department structures. Unlike universities, each polytechnic focuses on a designated area of study. There is no separate ICT

department in each polytechnic specifically designed to deliver ICT competency to those with a non-technical background. The general ICT awareness and competency are still considered insufficient to teach ICT-embedded topics in depth within the commerce curriculum. Previous research has highlighted the challenge of a shortage of teaching staff for non-technical courses (Kakeshita & Ohtsuki, 2019). Malaysian Polytechnic's lecturers are proposing to upskill their ICT knowledge through train-the-trainer initiatives, with the aim of incorporating more technical topics into specific courses.

6. CONCLUSION

Overall, the research shows that Malaysian Polytechnic's lecturers possess a high level of ICT awareness, as well as very high competency in ICT pedagogy and web/application usage. They align with the 21st-century education environment, and Malaysian Polytechnics are moving forward alongside other higher education providers in Malaysia. These findings will be essential inputs for drawing insights into upskilling and reskilling alternatives for commerce lecturers. This general ICT awareness level among Malaysian Polytechnic's will benefit the relevant authorities in determining any reskilling or upskilling courses that suit commerce lecturers. This requirement listed in seven principle of Malaysian Skills Certification (Jamaludin et al., 2023). It is also suggested that the relevant authorities of Malaysian Polytechnics assess the readiness of ICT tools and technology to meet the demands of 4IR education.

7. LIMITATION

While conducting this research, several limitations were encountered that might affect the findings. First, this is a preliminary analysis that follows a 5:1 ratio (sample to item) in selecting the sample. It is suggested that future research use the Krejie and Morgan sampling model, which is a commonly used technique among researchers. The instrument also recommends including age as demographic information to classify ICT acceptance among lecturers by age group. Researchers from other areas, such as agrotechnology, bio-industry, general studies, or national services, also suggest expanding this research based on their specific scopes.

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