Competency Levels of Teachers' Knowledge and Skills in Using Information and Communication Technology-Based Teaching Aids at Sekolah Kebangsaan Jementah

[1]Muhammad Aniq Aqmal Abdul Hakim, [2]Isa Hamzah

[1,2]Faculty of Education, Universiti Kebangsaan Malaysia
Corresponding Author Email: isa_hamzah@ukm.edu.my

Abstract
The use of Information and Communication Technology (ICT) in education has become increasingly important to ensure the effectiveness of teaching and learning. This study evaluates the level of knowledge and skills of teachers at Sekolah Kebangsaan Jementah in using ICT-based teaching aids (ICT-BBM) and analyzes competency differences based on demographic factors such as gender, age, and teaching experience. This quantitative study utilized questionnaires distributed to 30 teachers and analyzed using descriptive and inferential statistics. Findings indicate that teachers' knowledge and skills are at a moderate to high level, with experienced teachers demonstrating better ICT capabilities compared to novice teachers. This study suggests the need for more intensive technology training programs to strengthen teachers' competencies in adapting to 21st-century educational developments.
Keywords: Teacher Competency, Information and Communication Technology (ICT), Teaching Aids, 21st-Century Education, Teacher Training

Introduction
In the modern era of education, the use of ICT has become an integral element in the teaching and learning process. Integrating technology enables more interactive, relevant, and engaging teaching delivery for students of varying comprehension levels. However, the effectiveness of such integration largely depends on the competency levels of teachers in applying technology effectively. This competency encompasses technical knowledge, the ability to handle digital tools, and the capability to use appropriate software to support learning.

This study was conducted at Sekolah Kebangsaan Jementah to assess teachers' competencies in using ICT-based teaching aids, considering demographic factors such as

gender, age, and teaching experience. These findings are crucial for stakeholders to plan more effective technology training and support programs, especially for teachers in rural areas.

This study holds dual significance. Academically, it contributes to the literature on technology integration in education, particularly in the context of primary schools in Malaysia. Previous studies have shown that factors like gender, age, and teaching experience influence teachers' ICT competency levels. For example, Minhat (2021) identified a lack of training as a major challenge for teachers, while Ravendran & Daud (2020) indicated that teaching experience correlates with teachers' technological skills, with experienced teachers exhibiting higher proficiency compared to newer ones.

Additionally, this study is instrumental in aiding schools and policymakers to design more effective and relevant training programs, particularly in enhancing teachers' readiness to face educational technology developments. Focused training programs can help teachers improve their ICT proficiency, thus bridging the competency gap, especially among less experienced teachers.

In summary, the findings of this study are expected to provide a comprehensive overview of the training and technological support needs of primary school teachers while enhancing technology-based learning efforts within Malaysia's education system.

Literature Review

This literature review examines the concept of teacher competency in technology and its relationship with teaching effectiveness. Competency encompasses knowledge, technical skills, and attitudes towards the use of technology in the classroom (Khuzaimah et al., 2019). Minhat (2021) stated that a lack of regular training poses a major challenge for teachers in applying technology. Another study by Ravendran & Daud (2020) highlighted the significant role of teaching experience, with experienced teachers being more proficient in using technology.

Furthermore, Mohd Tahir (2021) found that well-prepared and trained teachers can enhance classroom interaction through digital applications such as PowerPoint and Kahoot. However, a competency gap remains between young and experienced teachers, emphasizing the urgent need for continuous and relevant technology training. Ravendran & Daud (2020) also discovered that teachers' skill levels in using technology vary with teaching experience. Experienced teachers tend to have higher proficiency in using technology compared to less experienced teachers. This indicates a competency gap between veteran and novice teachers.

Mohd Tahir (2021) also emphasized that teachers' readiness to use technology is a crucial factor in their teaching effectiveness. Teachers who are well-prepared and skilled in technology can enhance classroom interaction and facilitate students' understanding through various digital teaching aids, such as PowerPoint and instructional videos. In conclusion, regular training and sufficient technical support are vital to ensure that teachers fully utilize technology in the classroom.

Methodology

This study employed a quantitative approach using a descriptive survey design. This method was chosen as it allows for the systematic and detailed collection of data regarding teachers' competency levels in using ICT-based teaching aids. The study population consisted of all teachers at Sekolah Kebangsaan Jementah, Segamat, Johor. A random sample of 30 teachers was selected. The sample size was deemed sufficient to obtain meaningful data for statistical analysis.

Data was collected using questionnaires distributed to the teachers. The questionnaire was divided into three main sections:

Section A: Collection of demographic information, such as gender, age, and teaching experience.

Section B: Assessment of teachers' knowledge of ICT-based teaching aids.

Section C: Evaluation of teachers' skills in utilizing these technologies in teaching.

The measurement instrument used a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." The collected data was analyzed using SPSS software to generate descriptive statistics such as mean, percentage, and standard deviation for each questionnaire item. Additionally, inferential analysis was conducted to identify competency differences based on demographic factors.

Findings

In this study, demographic data revealed that the majority of participating teachers were female (80%), with most aged 40 and above. Additionally, 43.3% of the teachers had more than 20 years of teaching experience. The teachers' educational qualifications showed that most held a bachelor's degree as their highest academic attainment.

Teachers' knowledge levels regarding the use of ICT-based teaching aids (ICT-BBM) were assessed through various aspects, such as theoretical knowledge, technological awareness, and the use of technological tools like PowerPoint, instructional videos, and interactive aids. The mean scores for teachers' knowledge ranged from 3.8 to 4.1, indicating a high overall level of knowledge among teachers at SK Jementah in utilizing ICT.

Teachers' skill levels were evaluated based on their ability to apply ICT in teaching processes. The results showed that more experienced teachers exhibited higher skills in using ICT, particularly in delivering content through digital teaching aids. Conversely, less experienced teachers displayed lower proficiency, especially in employing interactive digital applications like Google Classroom, Kahoot, or Quizizz.

Moreover, the study found that female teachers demonstrated slightly higher levels of knowledge and skills compared to their male counterparts, although the difference was not substantial. Teaching experience played a significant role in determining teachers' skill levels. Teachers with over 20 years of experience showed better competence in leveraging ICT-based teaching aids than those with less than 10 years of experience.

Discussion

The findings of this study indicate that teachers at Sekolah Kebangsaan Jementah generally possess good knowledge and skills in using ICT-based teaching aids. However, differences in competency levels exist based on teaching experience and other demographic factors such as age and gender. These results align with previous studies by Ravendran & Daud (2020), which showed that experienced teachers tend to have higher skills in using technology in their teaching. This is likely due to their extensive experience in adapting to technological advancements and changes in education.

Nevertheless, the skill gap between experienced and less experienced teachers is an issue that needs attention. Younger or less experienced teachers often face difficulties effectively integrating technology into the classroom, particularly when using interactive teaching aids such as online applications and digital platforms. A lack of training and technical support could contribute to this gap.

The study also found that female teachers demonstrated slightly higher skills in using technology compared to male teachers, although the difference was minimal. This might be attributed to female teachers' greater willingness to attend training programs or their higher involvement in professional development courses related to educational technology.

One issue highlighted in this study is the lack of regular training provided by schools or the Ministry of Education for teachers, particularly in the use of digital technology. Regular training and technical support need to be intensified to ensure that teachers can master more complex digital tools and utilize them more effectively in the classroom.

Additionally, the study suggests that less experienced teachers require intensive training in using interactive applications such as Google Classroom, Kahoot, and other software relevant to 21st-century learning. Schools and education administrators should consider offering more courses and workshops that can enhance technological skills among teachers.

Conclusion

This study found that teachers at Sekolah Kebangsaan Jementah possess moderate to high levels of knowledge and skills in using ICT-based teaching aids. However, a competency gap exists based on experience and demographic factors. Experienced teachers demonstrated better proficiency in educational technology, while younger teachers require more training and technical support.

The findings highlight the need for more intensive, practical, and regular technology training programs to enhance teachers' efficiency. These programs should be tailored to individual needs and experience levels, focusing on relevant interactive digital tools. This approach can ensure the effectiveness of technology-based teaching and support Malaysia's educational transformation efforts.

The study implies that education administrators should introduce more training programs and technical support to improve teachers' technological skills, particularly among

less experienced teachers. Further research can also be conducted to evaluate the impact of technology training on the effectiveness of teaching and learning in broader contexts.

Overall, this study makes a significant contribution to educational literature by emphasizing the role of technology training in improving teacher competency and technology-based teaching. Better and continuous training programs will ensure that teachers are well-prepared to face technological challenges in the classroom and enhance teaching effectiveness.

References

Ng, W. (2023). Digital literacy model for teachers in Malaysia. Journal of Information and Knowledge Management, 2(1), 450-462.

Zainal, A. Z., & Zainuddin, S. Z. (2020). Technology adoption in Malaysian schools: An analysis of national ICT policy initiatives. Digital Education Review, 37, 175–190.

Hasnuddin, N., Raman, A., & Bordbar, F. (2022). Teachers' ICT competency and technology leadership practices in rural schools. International Conference on Computers in Education (ICCE), 688–693.

Minhat, M. (2021). Digital readiness and professional development for teachers. Bangi: Penerbit Universiti Kebangsaan Malaysia.

Ravendran, R., & Daud, S. (2020). Challenges in the use of information technology in education. Jurnal Teknologi Pendidikan Malaysia, 5(1), 35-49.

Kamarul Azmi, K., & Ab. Halim, T. (2007). The use of technology in Islamic education. Jurnal Pendidikan Islam Malaysia, 3(2), 45-57.

Ministry of Education Malaysia. (2013). Malaysia Education Blueprint 2013-2025. Putrajaya: Ministry of Education Malaysia.

Minhat, M. (2021). The use of technology in education: Challenges and opportunities. Bangi: Penerbit Universiti Kebangsaan Malaysia.

Rosnaini, H. (2006). Information technology in education. In A. Rahman (Ed.), Future education (pp. 101-115). Penerbit Utusan.