Jiang, B. et al. (Eds.) (2025). Proceedings of the 33rd International Conference on Computers in Education. Asia-Pacific Society for Computers in Education

# A Correlational Analysis between Technology Literacy and Technology Anxiety among Primary School Teachers in Sepang District, Selangor, Malaysia.

**Thilagavathi RAJENDRAN[a] & Su Luan WONG[b*]**
[a]*Faculty of Educational Studies, University Putra Malaysia, Malaysia*
[b]*Faculty of Educational Studies, University Putra Malaysia, Malaysia*
*suluan@upm.edu.my

**Abstract:** This study examines the relationship between technology literacy and technology anxiety among primary school teachers in the Sepang District, Selangor, Malaysia. A quantitative correlational research design was employed, involving 100 primary school teachers. Data were collected through a structured questionnaire adapted from validated instruments to assess the extent of technology literacy and technology anxiety among primary school teachers in Sepang District, Selangor, Malaysia. The descriptive analysis indicated that 70.57% of teachers demonstrated greater technology literacy and 76.86% of teachers experienced less technology anxiety when integrating technology into their instruction. Thus, the correlation analysis revealed a strong, statistically significant negative relationship between technology literacy and technology anxiety ($r = -.873$, $p < .0005$), suggesting that teachers with greater technology literacy tend to be less anxious when integrating technology in their teaching. Overall, these findings underscore the importance of enhancing technology literacy among primary school teachers to alleviate anxiety associated with technology use. Providing enhanced training and support for primary school teachers may help bridge gaps in technology literacy, promoting more efficient and anxiety-free technology integration in the classrooms.

**Keywords:** Technology Literacy, Technology Anxiety, Primary School Teachers, Technology in Education, Educational Technology, Correlational Study, Malaysia
`

## 1. Introduction

The rapid development of technology creating a tremendous impact on various sectors globally especially in the field of education. Technology has been acting as the catalyst for transforming the procedure of teaching in schools and making learning easier and innovative for learners. The integration of technology into education has become a focal point of discussion in recent years, particularly as countries invest significantly in educational technologies to enhance teaching and learning outcomes (Abdul Rauf & Suwanto, 2020). The success of integrating technology in classrooms hinges significantly on teachers' readiness and attitudes, which include both their competence in utilizing digital resources and their affective responses towards technology integration (Henderson & Corry, 2021). Technology competence, skills and knowledge of teachers are the core factors in the effective and impactful integration of technology in teaching (Cruz & Rajan, 2022). The concept of technology literacy, including the knowledge and skills are necessary to effectively use technology, has become essential for 21st-century educators (Saimi & Yamat, 2021). Lack of technological knowledge and skills among teachers are one of the barriers associated with

the use of technology in education (Cruz & Rajan, 2022). Simultaneously, technology anxiety, defined as the apprehension and discomfort experienced when interacting with technology, can act as a major barrier to effective technology use among teachers. According to Rahimi & Yadollahi (2011), higher technology anxiety among teachers impeded them from using technology in their teaching practices.

In Malaysia, the education system aligns with global trends by progressively integrating digital technologies to improve pedagogical effectiveness and student learning. These efforts are formally outlined in the Malaysia Education Blueprint 2013-2025, which emphasizes leveraging ICT to transform teaching and learning. One of the blueprint's key aspirations is to ensure that every student is equipped with 21st-century skills, including digital literacy, while calling for increased support for teacher training and digital infrastructure in schools. However, the success of these efforts depends not just on the availability of technological infrastructure but also on the capacity of teachers to integrate these tools meaningfully into their instruction (Zainal & Saimin, 2021). Teachers' competencies and literacy regarding technology play a pivotal role in determining the extent and effectiveness of technology integration in classrooms. Many teachers experience stress from the constantly evolving technological demands, which can negatively affect their psychological well-being, and teaching effectiveness (Fernández-Batanero et al., 2021). Although technology has significantly transformed the educational system (Ayub et al., 2015), the consistent and effective integration of digital tools in Malaysian primary schools remains inconsistent.

Despite significant investment in technology infrastructure and teacher training programs, technology anxiety continues to be a limiting factor in the full utilization of educational technology in schools. While numerous studies have explored teachers' general knowledge toward ICT, few have examined how technology affects their emotional well-being, particularly in relation to stress and anxiety (Fernández-Batanero et al., 2021). Teachers, often expected to demonstrate resilience, may overlook or minimize their own struggles with anxiety (Alzahari et al., 2023). According to Henderson and Corry (2021), one way to help teachers become more confident and resilient in the face of constant technological change is to address the sources and reduce their anxiety. Thus, understanding the relationship between technology literacy and technology anxiety among Malaysian primary school teachers is critical for identifying the potential strategies to support effective technology adoption in schools.

Consequently, this study seeks to bridge this gap by thoroughly examining the correlation between technology literacy and technology anxiety among primary school teachers in Malaysia, with the goal of informing the creation of targeted interventions and support systems designed to improve teacher technology literacy and anxiety. Understanding this relationship can help school administrators and policymakers better support teachers in adopting educational technology, eventually contributing to more effective teaching practices and improved educational outcomes.

## 2. Related studies

### *2.1 Technology literacy*

According to Davies (2011), technological literacy is knowing what can be done with the technology, how to use the technology proficiently and deciding on the types of the technology and the appropriate time and date for usage. In a pragmatist approach, technology literacy is defined as the capability to adopt, adapt, invent and assess technology to affect own life, community and environment positively (Yeşilyurt & Vezne, 2023). The concept of technology literacy is one of the 21$^{st}$ century skills to adapt to changing conditions. Technology literacy is the ability to use digital technology to access, integrate, manage, evaluate and produce

information and to explore the information in the digital environment and to ensure its transmission (Hidiroglu et al., 2021). A technologically literate individual should possess foundational knowledge of technology and basic technical abilities such as troubleshooting simple device issues, applying problem-solving strategies, thinking critically about technological concerns, and acting responsibly (Yeşilyurt & Vezne, 2023). Technology literacy among teachers refers to the ability to use, understand, evaluate and manage educational technology to integrate in teaching and learning practices effectively. Technologically literate teacher must attain a certain amount of fundamental knowledge about technology and some basic technical capabilities.

### *2.2 Technology anxiety*

Technology anxiety can be defined as the tension from the anticipation of a negative outcome related to the use of technology (Wilson et. al., 2023). According to Berner (2023), technology anxiety is the attitude that affect the relationship to the technology used and can influence continuity and any new adoption of a technology. Technology anxiety refers to the feeling of uneasiness or anxiousness that individuals deal with when faced with computers or technologies (Gunasinghe & Nanayakkara, 2021). Technology anxiety among teachers refers to fear, stress, depress or discomfort that experienced by teachers when using, interacting with or adapting to new technologies. This anxiety can manifest as frustration, avoidance of technology in teaching and learning practices or feeling overwhelmed by digital tools.

## 3. Methodology

### *3.1 Research Design*

This study employed a quantitative, correlational research design to examine the relationship between technology literacy and technology anxiety among primary school teachers in the Sepang District, Selangor, Malaysia.

### *3.2 Participants and sampling*

A two-stage random sampling method was utilized in this study. This approach integrated both cluster random sampling and individual random sampling method. Initially, the population is divided into smaller units known as clusters. A number of these clusters are then randomly chosen, followed by the random selection of individuals from within the selected clusters (Ary et al., 2010). There is total 40 primary schools in the Sepang District of Selangor, Malaysia, with a total of 2,024 primary school teachers. From this population, 100 teachers were randomly selected from the chosen schools to participate in the study.

### *3.3 Research Instrument*

A structured questionnaire, adapted from validated instruments, was employed to collect quantitative data of this study. It comprised three sections: Section A captured teacher's demographic information, encompassing age, gender, teaching experience, education level, frequency of technology use, ICT training participation. Section B assessed teacher's technology literacy using 7 items adapted from Silva et al. (2020) on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree); and Section C measured teacher's technology

anxiety using 7 items adapted from the Technology Anxiety Scale (TAS) by Wilson et al. (2023), also on a 5-point Likert scale. The instrument was pilot-tested for clarity and reliability prior to full deployment. Content validity was established through expert review, while internal consistency reliability was confirmed via Cronbach's alpha, which exceeded .80 for both constructs, indicating strong internal consistency.

### *3.4 Data Collection Procedure*

The questionnaires were distributed to the respondents digitally through google form. Respondents were briefed about the study's purpose and assured of their confidentiality and anonymity. Participation was voluntary, and informed consent was obtained from all respondents. The data collection process spanned two weeks, ensuring adequate response rates.

### *3.5 Data Analysis Techniques*

Data were analyzed using SPSS (Statistical Package for the Social Sciences). The following analyses were conducted:

#### *3.5.1 Descriptive and Inferential Statistics*

Frequencies, percentages, means, and standard deviations were computed to determine the extent of technology literacy and technology anxiety among primary school teachers in Sepang District, Selangor, Malaysia. Pearson's correlation coefficient was then employed to examine the relationship between technology literacy and technology anxiety among primary school teachers in Sepang District, Selangor, Malaysia. A significance level of $p < 0.01$ was adopted to evaluate the strength and significance of the correlation.

## 4. Results/findings

This section presents the results and findings of the study. The questionnaire was completed by 100 teachers.

### *4.1 Descriptive Findings*

Table 1 and Table 2 summarize the extent of technology literacy and technology anxiety among the respondents.

Table 1. *Technology Literacy among Primary School Teachers*

| Items | Strongly disagree | | Disagree | | Undecided | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I can assimilate technological knowledge easily. | 8 | 8.0 | 12 | 12.0 | 15 | 15.0 | 42 | 42.0 | 23 | 23.0 |
| I keep up to date with the most important new technologies. | 5 | 5.0 | 15 | 15.0 | 11 | 11.0 | 45 | 45.0 | 24 | 24.0 |
| I know how to solve my problems related to ICT. | 2 | 2.0 | 18 | 18.0 | 8 | 8.0 | 44 | 44.0 | 28 | 28.0 |
| I can guide my colleagues in the integration of technological literacy. | 4 | 4.0 | 17 | 17.0 | 15 | 15.0 | 40 | 40.0 | 24 | 24.0 |
| I am able to select useful technologies to support my teaching career. | 2 | 2.0 | 18 | 18.0 | 4 | 4.0 | 50 | 50.0 | 26 | 26.0 |
| I have the technical skills I need to use technology. | 6 | 6.0 | 14 | 14.0 | 10 | 10.0 | 32 | 32.0 | 38 | 38.0 |
| I know many different technologies. | 7 | 7.0 | 13 | 13.0 | 2 | 2.0 | 34 | 34.0 | 44 | 44.0 |

Based on Table 1, a total of 65% of respondents (strongly agreed = 23%, agreed = 42%) reported that they could assimilate technological knowledge easily, while 69% reported keeping up to date with the most important new technologies. In addition, 72% agreed or strongly agreed that they knew how to solve problems related to ICT, and 64% indicated they could guide colleagues in integrating technological literacy. The highest agreement was seen in the ability to select useful technologies to support their teaching career (76%) and in knowing many different technologies (78%), followed closely by having the technical skills needed to use technology (70%). Overall, the findings indicated a higher technology literacy among teachers, although a consistent proportion of around 20% reported disagreement across items, suggesting the presence of a subgroup with lower technology literacy that may require targeted support.

Table 2. *Technology Anxiety among Primary School Teachers*

| Items | Strongly disagree | | Disagree | | Undecided | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % |
| I am not a technology person. | 15 | 15.0 | 62 | 62.0 | 3 | 3.0 | 13 | 13.0 | 7 | 7.0 |
| I am uncomfortable when using technology. | 34 | 34.0 | 43 | 43.0 | 3 | 3.0 | 17 | 17.0 | 3 | 3.0 |
| I often annoyed when using technology. | 16 | 16.0 | 61 | 61.0 | 5 | 5.0 | 12 | 12.0 | 6 | 6.0 |
| I feel out of control when using technology. | 14 | 14.0 | 63 | 63.0 | 3 | 3.0 | 14 | 14.0 | 6 | 6.0 |
| I am reluctant to learn new features of technology. | 20 | 20.0 | 57 | 57.0 | 8 | 8.0 | 8 | 8.0 | 7 | 7.0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I am inefficient with technology. | 31 | 31.0 | 46 | 46.0 | 1 | 1.0 | 19 | 19.0 | 3 | 3.0 |
| Using technology in my teaching makes me nervous and anxiety. | 25 | 25.0 | 51 | 51.0 | 3 | 3.0 | 14 | 14.0 | 7 | 7.0 |

Based on Table 2, the majority of respondents either disagreed or strongly disagreed with all statements related to technology anxiety, indicating that they generally experienced less technology anxiety. Agreement with negative statements was consistently low, ranging from 15% to 22%. The highest anxiety indicators were “I am inefficient with technology” (22%) and “Using technology in my teaching makes me nervous and anxiety” (21%), followed by “I am not a technology person” (20%) and “I feel out of control when using technology” (20%). The lowest was “I am reluctant to learn new features of technology” (15%). These results suggest that while most teachers are comfortable and confident with technology, a small but notable group continues to experience anxiety, potentially benefiting from targeted training and support.

### *4.2 Correlation Analysis*

Pearson correlation analysis was performed to examine the relationship between technology literacy and technology anxiety among the primary school teachers. The results are presented in Table 3.

Table 3. *Pearson Correlation Between Technology Literacy and Technology Anxiety*

| | | Technology Anxiety |
|---|---|---|
| Technology Literacy | Pearson correlation | -.873** |
| | Sig. (2-tailed) | .000 |
| | N | 100 |

The analysis yielded a Pearson correlation coefficient of r = -.873 with a significance value of p <.0005. This result demonstrates a strong, negative, and statistically significant relationship between technology literacy and technology anxiety. The results indicated that higher technology literacy are associated with lower technology anxiety among primary school teachers. This suggests that teacher with greater technology literacy are significantly less likely to experience technology anxiety, thereby supporting more effective technology integration in classroom practices.

## 5. Discussion

The descriptive findings indicate that most respondents reported positive perceptions of their ability to use technology, with the strongest agreement in knowing many different technologies and selecting useful tools for teaching. In contrast, agreement with negative statements about technology was low, suggesting that technology-related anxiety was not widespread. The most notable concerns were feelings of inefficiency and nervousness when using technology in teaching. Overall, the results indicated that most primary school teachers in Sepang District are confident and capable of using technology. However, a small but consistent group experiences both difficulties and discomfort, highlighting the need for targeted interventions to strengthen their technology literacy.

The results of this study revealed a strong and statistically significant negative relationship between technology literacy and technology anxiety (r = -.873) among primary school teachers in Sepang District, Malaysia. This indicates that teachers with higher technology literacy are less likely to experience anxiety when engaging with digital tools in educational settings. The findings of this study are consistent with previous literature that have highlighted teacher's digital competence as a key factors in reducing barriers to technology integration (Fernández-Batanero et al., 2021; Henderson & Corry, 2021). Meanwhile, the findings of the study also align with Fathali et al. (2024), who reported that higher technology literacy associated with lower technology anxiety, leading to greater confidence and efficacy in the teaching process. These findings support the idea that developing teacher's technology literacy not only improves their technical ability but also plays an important role in reducing technology anxiety and fostering psychological readiness for technology integration in classrooms. This study indicated that teachers who are technologically literate are more likely to feel confident, in control, less anxiety and efficient when using educational technology. This relationship holds particular significance within the Malaysian context.

The findings of this study are highly relevant in the context of Malaysia's national education, particularly the Malaysia Education Blueprint 2013-2025, which places a strong emphasis on embedding ICT into teaching and learning practices. Although technology infrastructure and access to digital tools have improved in most Malaysian primary schools, this study indicates that without addressing and enhancing the psychological readiness of primary teachers, technology initiatives may fall short of achieving meaningful integration in primary education. Higher technology anxiety among teachers may impede them from using technology in their teaching practices (Rahimi & Yadollahi, 2011)

In light of these findings, school administrators and policymakers should prioritize ongoing professional development and personalized ICT training that focuses not only on technical skills but also on building confidence and reducing technology anxiety. Previous studies suggest that adequate in-service training for teachers is a crucial element that should be provided, so that they can have the latest skills in teaching and digital technology that align with current educational demands (Adams & Muthiah, 2020; Zainal & Saimin, 2021). This may improve teacher's technology literacy, making them less likely to experience technology anxiety when use technology in teaching practices. Peer mentoring, collaborative learning environments, and continuous support systems may help teachers overcome technology anxiety and develop more positive attitudes towards technology adoption. The findings of the study align with previous research indicating that increasing technology literacy can significantly reduce technology anxiety in using educational technology. Teachers who are confident in their technological skills are more likely to embrace ICT tools in classroom settings. These insights are essential for policymakers and school administrators in designing targeted training programs related to technology.

## 6. Conclusion

This study carried out to examine the relationship between technology literacy and technology anxiety among primary school teachers in the Sepang District of Selangor, Malaysia. This insight is vital for understanding the psychological and practical challenges teachers face as they strive to integrate digital tools into their teaching practices. The study revealed that while a majority of teachers possess a higher technology literacy and report lower technology anxiety, a considerable minority still struggle with lower technology literacy and higher technology anxiety. This gap underscores the urgent need for targeted interventions, such as technology-related trainings or programs, to improve teacher's technology literacy and reduce technology anxiety. Such initiatives may help teachers adapt to the rapid technological changes in education and facilitate the smooth integration of technology into teaching and learning. Providing adequate support and training to reduce technology anxiety and build

teacher's confidence in technology integration is highly important in this digital era (Ateş & Gündüzalp, 2025). The study's findings are highly pertinent to enhancing the integration of technology in primary schools, within the framework of the Malaysia Education Blueprint 2013-2025, which prioritizes the incorporation of technology into teaching and learning. To ensure the successful and impactful integration of technology in primary education, teacher readiness which encompasses building confidence in using technology, fostering technology literacy and alleviating technology anxiety must be prioritized. Technology anxiety should be mitigated, as new technologies will continue to emerge in the future. Building upon the findings of this study and supporting evidence from existing literature, a higher technology literacy leads to lower technology anxiety and increase the effective integration of technology into teaching. Future research could explore longitudinal studies to track how technology literacy and anxiety evolve over time with continued training and policy support. It would also be valuable to investigate intervention strategies that are most effective in reducing technology anxiety and promoting digital resilience among primary school teachers. In conclusion, technology literacy is not merely a technical requirement but a foundational skill that significantly influences teachers' emotional readiness to adopt and utilize digital tools. The study concludes that technology literacy plays a vital role in reducing technology anxiety among primary school teachers. Enhancing technology literacy can empower teachers to effectively adopt technology in pedagogy, especially in rapidly digitizing educational environments. Further research could explore longitudinal effects or intervention-based models across different regions.

## Acknowledgements

Sincere appreciation is extended to the participating teachers from the Sepang District for their cooperation, time, and willingness to contribute to this research. Their support and participation were essential in ensuring the success and validity of this study. Special thanks go to the Ministry of Education Malaysia for their continued commitment to improving technology integration in schools, as well as to those who helped review the research instruments and offered valuable feedback throughout the research process.

## References

Abdul Rauf, A., & Suwanto, S. (2020). Attitudes and technology integration among ESL secondary school teachers in Sabah. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, *5*(12), 280–287. https://doi.org/10.47405/mjssh.v5i12.566

Adams, D.& Muthiah, V. (2020). Teacher education in Malaysia: Practices, challenges and future trends for the twenty-first century. In: Pushpanadham, K. (eds) Teacher education in the global era. Springer, Singapore. https://doi.org/10.1007/978-981-15-4008-0_9

Alzahari, N., Ahmad, Y., Ladisma@Awis, M., & Kamarunzaman, N. Z. (2023). Mental health awareness: A study on urban secondary school teachers in Selangor. *International Journal of Academic Research in Accounting Finance and Management Sciences*, 13(2), 887–902. https://doi.org/10.6007/ijarafms/v13-i2/18032

Ary, D., Jacobs, L. C., & Sorensen, C. K. (2010). *Introduction to research in education* (8th ed.). Wadsworth, Cengage Learning.

Ateş, H., & Gündüzalp, C. (2025). The convergence of GETAMEL and protection motivation theory: A study on augmented reality-based gamification adoption among science teachers. *Education and Information Technologies*. https://doi.org/10.1007/s10639-025-13480-1

Ayub, A. F. M., Bakar, K. A., & Ismail, R. (2015). Factors predicting teachers' attitudes towards the use of ICT in teaching and learning. *AIP Conference Proceedings* (vol. 1682).

Berner, J., Dallora, A. L., Palm, B., Berglund, J.S., & Anderberg, P. (2023). Five-factor model, technology enthusiasm and technology anxiety. *Digital health*, *9*. https://doi.org/10.1177/20552076231203602

Cruz, G. B. D., & Rajan, Dr. V. (2022). Factors predicting attitudes of teachers' towards the use of "ICT in Teaching and Learning." *Technoarete Transactions on Application of Information and Communication Technology(ICT) in Education*, *1*(2). https://doi.org/10.36647/ttaicte/01.02.a002

Davies, R. S. (2011). Understanding technology literacy: A framework for evaluating educational technology integration. *TechTrends*, *55*(5), 45–52. https://doi.org/10.1007/s11528-011-0527-3

Fathali, S., Emadi, A., & Lotfi Jebeli, S. (2024). Digital literacy and EFL teachers' anxiety with teaching online via a virtual classroom software. *The JALT CALL Journal*, *20*(2), 1–21. https://doi.org/10.29140/jaltcall.v20n2.1154

Fernández-Batanero, J., Román-Graván, P., Reyes-Rebollo, M., & Montenegro-Rueda, M. (2021). Impact of Educational Technology on Teacher stress and Anxiety: A literature review. *International Journal of Environmental Research and Public Health*, *18*(2), 548. https://doi.org/10.3390/ijerph18020548

Gunasinghe, A., & Nanayakkara, S. (2021). Role of technology anxiety within UTAUT in understanding non-user adoption intentions to virtual learning environments: the state university lecturers' perspective. *International Journal of Technology Enhanced Learning*, *13*(3), 284. https://doi.org/10.1504/ijtel.2021.10036681

Henderson, J., & Corry, M. (2021). Teacher anxiety and technology change: A review of the literature. *Technology, Pedagogy and Education*, *30*(4), 1–15. https://doi.org/10.1080/1475939x.2021.1931426

Hidiroglu, Y, O., Hidiroglu, C. N., & Tanriogen, A. (2021). The relationship between technology literacies and proactive personalities of secondary school mathematics teachers. *International Journal of Technology in Education and Science*, *5*(4), 648–672. https://doi.org/10.46328/ijtes.255

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

Rahimi, M., & Yadollahi, S. (2011). Computer anxiety and ICT integration in English classes among Iranian EFL teachers. *Procedia Computer Science*, *3*, 203–209. https://doi.org/10.1016/j.procs.2010.12.034

Saimi, N., & Yamat, H. (2021). Factors influencing ICT competency skills among ESL primary school teachers. *International Journal of Academic Research in Business and Social Sciences*, 10(1), 220-236. http://dx.doi.org/10.6007/IJARPED/v10-i1/8829

Silva, J. B., Nardi Silva, I, & Bilessimo, S. (2020). Technological structure for technology integration in the classroom, inspired by the maker culture. *Journal of Information Technology Education*: *Research*, *19*, 167-204. https://doi.org/10.28945/4532

Wilson, M. L., Huggins-Manley, A. C., Ritzhaupt, A. D., & Ruggles, K. (2023). Development of the abbreviated Technology Anxiety Scale (ATAS). *Behavior Research Methods*, *55*(1), 185–199. https://doi.org/10.3758/s13428-022-01820-9

Yeşilyurt, E., & Vezne, R. (2023). Digital literacy, technological literacy, and internet literacy as predictors of attitude toward applying computer-supported education. *Education and Information Technologies*. https://doi.org/10.1007/s10639-022-11311-1

Zainal, S. I., & Saimin, R. (2021). Exploring digital technology framework: Through the lenses of a qualitative study. *Sains Insani*, *6*(2). https://doi.org/10.33102/sainsinsani.vol6no2.321