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# DELVING INTO THE NEEDS OF DESIGN AND TECHNOLOGY TEACHERS' DIGITAL COMPETENCY

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### Abstract:

The current digital changes in the industrial world of work impacted the need for education in terms of equipping students with future skills. This situation requires teachers to adjust their instructional strategies in response to the present requirements of their students. The current educational approach provides students with exposure to the challenges and requirements of the modern era, characterised by the swift progression of technological advancements. Therefore, it is imperative that teachers possess the necessary competence to adapt and stay abreast of these current advancements in technology. Reports indicate a deficiency in teachers' integration of technology into their teaching activities in the subjects of Design and Technology (D&T). Hence, this study aims to determine the required complementary skills that are essential to D&T teachers in order to ensure that their competencies are in line with the demand of digitalization in education. This study employed a comprehensive literature method by analysing sufficient articles in journals that related to the scope of the study. The findings of the study identified digital literacy, technology integration, and technical competency as skills that teachers should possess in delivering D&T subjects to meet the demands of digitalization in education. Therefore, the outcome of this study provides valuable insights into emerging skill requirements for teachers in the D&T subjects, which are in line with current demands and trends. Consequently, this research offers valuable insights for stakeholders. These insights can be used to ensure that D&T teachers are equipped with the current competencies that align with the demands of digitalization education.

**Keywords:**

Teacher Competency, Design and Technology, Digitalization, Digital Literacy, Technology Integration, Technical Competency

**Introduction**

The increasing use of technology in the workforce is not just a requirement, but an essential factor for ensuring sustainability and competitiveness in the fast-paced global industry (R. Ismail et al., 2022; Twiner et al., 2022). The United Nations' Sustainable Development Goal 9 emphasises the necessity of improving technological expertise in all industries as part of the 2030 Sustainable Development Goals. This highlights the crucial role of technology in addressing future challenges. This emphasis extends not only to industrial development but also to education, as emphasised in Sustainable Development Goal 4, which emphasises the significance of educational assistance for technological progress.

Educational systems, encompassing both schools and higher education institutions, provide a distinct opportunity for students to grasp and actively participate in the utilisation of emerging technologies. Policies at the state, national, and international levels, including those established by the Organisation for Economic Co-operation and Development (OECD) namely The Future of Education and Skills 2030 project, recognise the fast rate of technological progress fueled by the increasing pace of globalisation. The OECD stresses the importance of providing learners with the necessary skills to shape their own lives and make meaningful contributions to the lives of others (OECD, 2018)

Malaysia has also issued guidelines to address the evolving technological changes. The Malaysian government's efforts to outline the necessity for enhancing technology-related skills are articulated through the New Industrial Master Plan 2030 (NIMP 2030). This master plan represents a revolutionary shift in the industry, advocating the embracement of technology and digitalisation to drive innovation, enhance productivity and create new opportunities for economic growth that emphasize companies to adopt technology and digitalisation is one of the NIMP 2030 aims.

The Ministry of Education Malaysia (MOE) considers these trends to be essential requirements for promoting the holistic development of students. The MOE Transformation Plan 2019-2023 serves as the foundation for incorporating digital integration in education, specifically in Malaysia. MOE has launched the Digital Education Policy (2023) to acknowledge the importance of the ongoing digitization process in education and to demonstrate their continuous dedication to this effort. This policy is a proactive measure taken in response to the ongoing technological advancement, aiming to prepare for the anticipated future challenges (R. Ismail et al., 2022).

Therefore, the essential role of teachers as mediators fuelling this transformative process must be emphasised. Given the constantly changing nature of educational technology, teachers need to be proactive in their preparedness to accept and adjust to the incorporation of digital tools in the field of education (Al-Zaman, 2019; Maksimovic et al., 2021; Twiner et al., 2022). This adaptation exceeds mere familiarity, it requires a deep comprehension and integration of technology in teaching methods. The process of adapting to digitalization in education requires

an effort from teachers with support from stakeholders. It requires ongoing professional development, a dedication to keeping up with technological advancements, and a readiness to explore inventive teaching methods that utilise the potential of technology. By embracing this transformative role, teachers make a significant contribution to preparing students for a future in which technological fluency is not only advantageous but also essential for achieving success (Endot & Jamaluddin, 2023).

However, despite the recent emergence of technologies, there is limited understanding of how they will alter the dynamics of learning communities and classroom practices. There is some evidence indicating a deficiency in teachers' integration of technology into their teaching activities (Ali et al., 2019; Hart-Anderson & Holme, 2023; Huei et al., 2019; Vartiainen & Tedre, 2023). Therefore, the objective of this study is to conduct a comprehensive investigation aimed at elucidating and clarifying the digitalization of competencies among Design and Technology (D&T) teachers, particularly with regard to addressing the current digital needs in D&T subject.

## Literature Review

### *Digitalisation in Education*

Al-Zaman (2019) argues that the current dependence of humans on technology highlights its essential nature at all times. The application of technological advancements has yielded significant advantages in multiple aspects of human existence, including the field of education. The influence of the ongoing technological growth on education is evident, beginning with the incorporation of virtual resources and digital conveniences in educational approaches. This integration not only facilitates the improvement of students' abilities but also surpasses conventional limitations (Alam et al., 2023). The integration of technology in education has surpassed traditional boundaries, providing students with the chance to access information from all over the world and interact with others around the world. Furthermore, technology enables the integration of practical experiences into the educational environment by utilising contemporary instruments and internet connectivity that can be accessed from almost any location (Maksimovic et al., 2021)

Education plays a crucial role in driving scientific, technological, and social advancements. Therefore, educators must actively incorporate new ideas and practises into their teaching methods to keep up with the latest technological developments and promote digital literacy (Roll & Ifenthaler, 2021; See et al., 2023). The continuous advancement in information and communication technologies has had a profound impact on the educational domain. Traditional teaching methods, which involve direct instruction and the use of teaching tools, are no longer considered adequate or efficient. In today's society, educators are expected to have digital competence, which includes their proficiency in media education and the ability to develop sufficient media literacy in future generations (Maksimovic et al., 2021).

The current educational environment is marked by a transition towards utilising technology to improve learning experiences. Virtual resources and digital tools are now essential elements of teaching methods, offering educators creative ways to involve students and create a lively and interactive learning atmosphere (so & Lee, 2023; Velentza et al., 2021). This shift in paradigm is in accordance with the changing requirements of students, who are progressively familiar and at ease with digital interfaces. Moreover, the integration of technology in education

dismantles geographical limitations, enabling students to acquire a vast amount of knowledge and engage in global collaboration with peers or experts. The profound influence of technology in education goes beyond theoretical knowledge and encompasses practical implementations through simulations, virtual laboratories, and other interactive tools that animate abstract concepts (Al-Zaman, 2019; Alam et al., 2023; Vartiainen & Tedre, 2023).

The impact of digitization within the education sector has fundamentally transformed the content knowledge and pedagogical skills required of teachers. Consequently, teachers must possess a diverse set of digital competencies to seamlessly integrate technology into the teaching and learning processes (Maksimovic et al., 2021). In light of this transformation, teachers are expected to not only be proficient in traditional teaching methodologies but also possess a nuanced understanding of various digital tools and platforms. This includes the ability to navigate and utilize educational technologies, create engaging digital content, and foster an environment that promotes digital literacy among students (Roll & Ifenthaler, 2021).

### ***Design and Technology***

Impacted by globalisation, Malaysia has undertaken a significant and methodical restructuring of its educational curriculum, positioning it as the standard for all educational institutions. Since beginning in 2013, the Malaysian Education Development Plan (PPPM) 2013–2025 has been a transformative endeavour. All aspects of quality, equity, and accessibility are addressed in the plan, which provides a detailed outline of the objectives that are to be accomplished over a period of thirteen years. This undertaking marks the beginning of a comprehensive transformation initiative that will be taking place over the course of fifteen years and will be dedicated to revitalising the national education system.

In the meantime, the Ministry of Education (MOE) has introduced the integration of Design and Technology (D&T) as a replacement for Living Skills (LS) in order to conform to the current requirements of the 21st century. Within this particular framework, students are anticipated to obtain knowledge, expertise, problem-solving capabilities, and mastery in communication (Lawati & Khan, 2023). The implementation of the Primary School Standard Curriculum (KSSR) replaced the Integrated Primary School Curriculum (KBSR) and led to the substitution of the LS subject with the D&T curriculum. The incorporation of the Design and Technology (D&T) subject began in 2014, initially implemented for Year 4 students, and later expanded to the secondary level in 2017 (Kementerian Pendidikan Malaysia, 2013).

According to the Kementerian Pendidikan Malaysia, (2019), Design and Technology (D&T) includes four main areas: design appreciation, technology application, product manufacturing, and product design assessment. The purpose of design appreciation is to develop in students a deep understanding and recognition of existing designs, which can then serve as a source of inspiration for the creation of more effective designs. The domain of technology application encompasses teaching students how to strategically utilise technology within the design framework across various disciplines (Zamri & Nurfaradilla, 2020). Product manufacturing involves creating more efficient product designs by following a systematic design process that is in line with modern technological advancements. Product design assessment encompasses the ongoing evaluation of the process of creating a design, with the aim of ensuring that the resulting products demonstrate significant value enhancement, problem-solving abilities, and competitiveness.

The utilisation of technology-based applications and tools facilitated the support of all these domains (Bahagian Pembangunan Kurikulum, 2019). The D & T subject also prioritises the enhancement of students' proficiency and comprehension in utilising tools and machinery (Mat Nor et al., 2018). This field of study enables students to understand and utilise technical knowledge and design principles in their daily tasks (Mohd Ridzuan et al., 2020). Mat Nor et al., (2018) state that Design and Technology (D & T) helps students comprehend the cognitive processes involved in thinking, planning, and enhancing their practical abilities by engaging in hands-on activities that involve creating and testing products. This allows students to utilise their knowledge and skills in relevant and demanding situations. In the meantime, Students can also learn and understand important concepts such as digital technology, automation, and robotics through Design and Technology. Students will understand how these technologies are used in product manufacturing and how they affect people's lives and society (Zamri & Nurfaradilla, 2020).

Bakar, (2018), argues that teachers in the field of Design and Technology (D&T) need to demonstrate expertise not only in subject knowledge but also in a wide range of skills in order to effectively cover all D&T topics. Multiple studies (Ahmad et al., 2019; Huei et al., 2019; Wilson & Harris, 2003) highlight the significance of acquiring competencies, including a deep understanding of subject matter, knowledge of effective teaching methods, proficiency in skills, expertise in handling tools, and the ability to assess effectively, for the successful delivery of the Design and Technology subject. The need for ongoing skill and knowledge updates is emphasised by the rapid advancements in technology and educational competencies in today's educational environment (McLain, 2022). Hence, Design and Technology (D&T) teachers must possess a comprehensive grasp of the subject matter and proficiency in utilising the tools employed in teaching D&T subjects. This entails ensuring that their knowledge and skills are sufficient to meet the digital demands influenced by regular technological advancements.

### **Methodology**

This study utilised a searching strategy that involved three distinct processes: identification, screening, and eligibility assessment (Shaffril et al., 2021). This study commenced with the research question serving as the fundamental basis. Specific terms were determined for conducting a literature search, and databases were selected as the platforms for locating articles. Subsequently, the search criteria were established for both inclusion and exclusion purposes. During the process of conducting an article search, relevant information was extracted and the quality of the articles was assessed ultimately. Every data has undergone a rigorous examination process, and interpretations have been derived based on the research questions.

Identification is employed to enhance the keywords utilised in data retrieval. This study employed advanced searching techniques and manual searching on two prestigious databases, Scopus and Web of Science (WoS). Both are widely recognised as the most extensive sources of articles in academic journals. The study also utilised Google Scholar to search for any relevant articles using the same keywords as those used in the Scopus and WoS search engine databases. Various search techniques were employed, including Boolean operators (AND, OR, NOT, or AND NOT), phrase searching, truncation, wildcard ("\*"), and field code functions. These techniques were either combined or used separately.



Table 1 shows the keywords that have been used for article searching based on types of database.

**Table 1: Keyword for Finding Related Articles**

Database	Keyword
Scopus	TITLE-ABS-KEY ( ( ( "design and technology" ) OR ( dnt ) ) AND ( ( competency ) OR ( "teaching skill" ) OR ( pedagog* ) OR ( skill ) ) ) AND PUBYEAR > 2018 AND PUBYEAR < 2024 AND ( LIMIT-TO ( OA , "all" ) )
WoS	ALL= ( ( ( "design and technology" ) OR ( dnt ) ) AND ( ( competency ) OR ( "teaching skill" ) OR ( pedagog* ) OR ( skill ) ) ) AND ( LIMIT-TO ( OA , "all" ) )
Google Scholar	Using specific keywords from Scopus and WoS, as well as Boolean operators, phrase searches, and field code functions (either together or individually) as appropriate Publications earned

The determination of inclusion and exclusion criteria was carried out to ensure the studies' relevance. Table 2 presents supplementary data, including categories of literature, languages, timeline, and country, based on researcher's criteria.

**Table 2: The Eligibility And Exclusions Criteria.**

Criterion	Eligibility	Exclusion
Literature type	Journal(Research Articles)	Journals (systematic review),book series, book, chapters in book and conference proceeding
Language	English and Malay	Non-English
Timeline	2019 - 2023	Before 2019

A systematic search strategy's screening procedure involves the inclusion or exclusion of items during the review process. The study does not include papers from other databases that have overlapping content. The researcher has set a temporal restriction on the publication year, specifically confining it to the timeframe from 2019 to 2023. This intentional decision guarantees that all studies incorporated in the paper are directly applicable to the present circumstances, thereby enhancing the significance of the results. Moreover, choosing this specific timeframe ensures a large and diverse collection of articles that can be examined, making it easier to conduct a thorough analysis of the existing literature. Afterwards, researchers conducted an eligibility process by employing a manual screening procedure to ascertain the relevant articles that will be incorporated in this article. The process entailed perusing the titles and abstracts of the articles. Out of the 632 articles identified from the database after the screening and eligibility process, only 23 articles were chosen to be included in this article, as depicted in Figure 1.

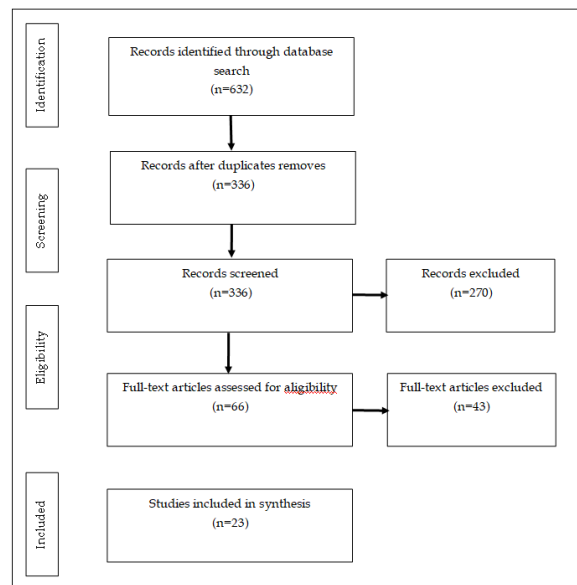
**Figure 1: PRISMA Diagram**

Figure 1 displays flow diagrams that illustrate the overall procedure for selecting articles and enhance the understanding of the described process. This diagram illustrates the quantity of records at each stage, beginning with the identified record, undergoing a screening text process, excluding irrelevant articles, and including articles that will be utilised in this study.

### Discussion and Conclusion

The results of the analysis of the 23 different articles that were used for this study are shown in the next section. The specifics of the papers that are a part of this study are presented in Table 3.

#### *Design and Technology Teacher's Digital Competency*

The Design and Technology (D&T) subject encompasses the acquisition of both theoretical knowledge and practical skills, aiming to address and resolve challenges that emulate real-world scenarios (R. Ismail et al., 2022; McLain et al., 2019; Twiner et al., 2022; Zamri & Nurfaradilla, 2020). This educational domain employs a systematic sequence of processes, facilitated by cutting-edge technology, to foster a comprehensive understanding of the principles and applications involved in solving problems within authentic contexts. The integration of contemporary technological tools and methodologies within the D&T curriculum not only enhances students' practical competencies but also underscores the relevance of this subject in preparing individuals for real-world challenges and advancements (Twiner et al., 2022).

Therefore, it is imperative for D&T teachers to possess a wide array of competencies, encompassing a variety of skills that are necessary for seamlessly incorporating technology into the curriculum (McLain, 2021). Proficiency in this skill is crucial not only for meeting the academic curriculum's demands but also for ensuring that students fully benefit from the instructional process. The diverse range of skills needed by D&T teachers plays a crucial role in enabling the effective integration of technology in the educational system. This, in turn, improves the overall learning experience and equips students with the necessary abilities to

meet the ever-changing requirements current needs. The diverse range of skills needed D&T teachers is crucial in enabling the smooth integration of technology into the educational system, thereby improving the overall learning process and equipping students with the necessary abilities to thrive in today's ever-changing academic environment (Hashim et al., 2021; A. A. Ismail & Hassan, 2019).



**Table 3: Overviews Of Selected Studies.**

Reference	Country	Design	Design and Technology Teacher's Digital Competency		
			Literacy Digital	Technology Integration	Practical Competency
Al Hakim et al., (2022)	Taiwan	Quantitative		√	
Ali et al., (2019)	Malaysia	Quantitative	√	√	√
Chalmers et al., (2022)	Australia	Qualitative		√	
Coulter, (2023)	United Kingdom	Mixed Method		√	
Endot & Jamaluddin, (2023)	Malaysia	Quantitative	√		√
Hart-Anderson & Holme, (2023)	Scotland	Qualitative	√	√	√
Hashim et al., (2021)	Malaysia	Qualitative		√	
Huei et al., (2019)	Malaysia	Quantitative			√
A. A. Ismail & Hassan, (2019)	Malaysia	Quantitative	√		√
R. Ismail et al., (2022)	Malaysia	Quantitative	√	√	√
McLain, (2022)	United Kingdom	Qualitative		√	
McLain, (2021)	United Kingdom	Mixed Method		√	
McLain et al., (2019)	United Kingdom	Qualitative			√
Mohd Ridzuan et al., (2020)	Malaysia	Qualitative		√	
Nasir et al., (2023)	Malaysia	Quantitative	√		
Nichols et al., (2022)	Australia	Quantitative	√		
See et al., (2023)	Australia	Qualitative	√		
So & Lee, (2023)	Hong Kong	Qualitative		√	
Twiner et al., (2022)	United Kingdom	Mixed Method	√	√	√
Uyub et al., (2021)	Malaysia	Quantitative		√	
Vartiainen & Tedre, (2023)	Finland	Qualitative	√	√	√
Velentza et al., (2021)	Greece	Quantitative		√	
Zamri & Nurfaradilla, (2020)	Malaysia	Quantitative		√	√

### ***Literacy Digital***

Teachers are increasingly integrating Information and Communication Technology (ICT) into their teaching methods, administrative duties, and communication strategies. This has resulted in various effects on classroom management, teaching techniques, educational approaches, and time management (R. Ismail et al., 2022; Nichols et al., 2022). This phenomenon exemplifies the profound influence of ICT on the educational environment. It not only affects the interactions within the classroom but also influences various aspects of teaching methods, administrative tasks, and communication ways between teachers and students (Ali et al., 2019; A. A. Ismail & Hassan, 2019).

See et al. (2023), report that it is crucial essential for educators to have adequate digital literacy, highlighting its pivotal function in successfully integrating digital technology into their instructional methods for the advantage of students. This proficiency is particularly important given the increasing integration of digital technologies, not only in professional communication settings but also in their widespread use in everyday life. Therefore, it is crucial to promote digital literacy among teachers, as it not only prepares them for current teaching requirements but also guarantees that students are prepared to navigate a future that is becoming more and more digital (Nasir et al., 2023).

Having proficiency in ICT skills would be highly beneficial for Design and Technology (D&T) teachers, as it can greatly assist them in their teaching and learning activities. Endot & Jamaluddin (2023) assert that possessing expertise in computer skills is essential for teachers, in line with the significance attributed to this aptitude in the national education blueprint. The competence mentioned not only enhances teaching activities but also indirectly helps teachers in dealing with challenges in the learning acquisition process, as emphasised by Nasir et al. (2023)

Previous research emphasises the diverse impact of Information and Communication Technology (ICT) skills, emphasising their role as essential teaching aids (Hart-Anderson & Holme, 2023; Nasir et al., 2023; Nichols et al., 2022; See et al., 2023; Vartiainen & Tedre, 2023). A study conducted by Vartiainen & Tedre (2023) serves as an example of how technology can be incorporated into the designing fabrics. This approach not only demonstrates the use of technology in educational environments but also highlights its ability to greatly enhance students' creative abilities. More precisely, the integration of technology, demonstrated by the use of artificial intelligence in fabric design, acts as a catalyst for increased creativity among students involved in fabric production. Utilising technology in educational practises enables a pedagogical approach that closely simulates real real-world situations. This is accomplished by investigating and utilising the information and resources accessible in the virtual realm (Twiner et al., 2022). An immersive approach is not only in line with the dynamic nature of the modern world, but it also improves students' engagement and understanding by exposing them to a wide variety of virtual experiences. Hence, the incorporation of technology in education acts as a means to connect the divide between theoretical learning and practical implementation, thereby promoting a more thorough and practical comprehension of the subject matter (Hart-Anderson & Holme, 2023; R. Ismail et al., 2022).

### ***Technology Integration***

The implementation of Information and Communication Technology (ICT) as a teaching aid has been addressed in the previous section. Furthermore, this section will emphasise the

utilisation of technological tools as a mechanism of delivering the teaching and learning process within the context of the Design and Technology (D&T) subject. See et al. (2023) and McLain, (2021) highlight the significance of teachers choosing appropriate tools for instructional activities to effectively equip students for future technologies. Prior research has consistently found that the incorporation of technology improves student involvement by introducing a sense of pleasure into the educational process, thereby resulting in more successful learning results. This highlights the importance of deliberate incorporation of technology in educational environments, in line with the changing requirements of the digital age (Al Hakim et al., 2022; Chalmers et al., 2022; Coulter, 2023; so & Lee, 2023; Velentza et al., 2021).

Findings from Velentza et al. (2021) and R. Ismail et al., (2022) highlights the use of robots as instructional tools as an effective method to engage students in the classroom. In addition to capturing attention, this application has demonstrated effectively in enhancing students' levels of attention. The students' confidence in robots' ability to effectively communicate information not only highlights their positive perception of technology but also establishes a positive connection between students and technological tools (So & Lee, 2023). In addition, Coulter, (2023), study provides valuable insights by demonstrating the beneficial effects of integrating microcontrollers into projects on students' understanding of programming concepts. These findings emphasise the advantages of incorporating sophisticated technological tools in educational environments to improve student engagement and comprehension (Uyub et al., 2021).

Within the field of Design and Technology (D&T), the fundamental principles revolve around three key activities: designing, creating, and assessing. These activities are supported by the seamless incorporation of advanced technology, as explained by McLain (2022) and Zamri & Nurfaradilla, (2020). This educational framework provides students with an interactive and practical experience, where they actively participate in the use of advanced technology tools and equipment throughout the project development process (R. Ismail et al., 2022; Nichols et al., 2022; Vartiainen & Tedre, 2023). This interactive method not only helps students achieve educational goals but also creates a hands-on learning environment that closely resembles real-life situations (Ali et al., 2019; Twiner et al., 2022; Uyub et al., 2021). The implementation of these latest tools and machines acts as a connection between theoretical understanding and practical implementation, enhancing students' educational experience in the field of Design and Technology (Hart-Anderson & Holme, 2023; Hashim et al., 2021; Mohd Ridzuan et al., 2020; Uyub et al., 2021).

### ***Practical Competent***

In order to fulfil the aims of the Design and Technology (D&T) subject, which include designing, making, and evaluating using technological tools and machines, it is essential for teachers to possess the necessary skills and knowledge to meet current educational standards (Huei et al., 2019). Teachers must have the competence to effectively navigate and manage technologically advanced tools and machines due to their exposure to them (Hart-Anderson & Holme, 2023; Zamri & Nurfaradilla, 2020). Teachers must possess competence in operating technological equipment and machinery, in order to facilitate a meaningful learning experience for students and to comprehend the functionalities of the tools utilised. Furthermore, this skill is essential for ensuring the security of students while they use these tools. It is crucial for teachers to possess both pedagogical knowledge and technological competence in order to

establish an educational setting that not only achieves the objectives of the Design and Technology curriculum but also improves students' understanding and guarantees their safety throughout the learning process (A. A. Ismail & Hassan, 2019; Vartiainen & Tedre, 2023).

According to Endot & Jamaluddin (2023) study, Design and Technology (D&T) teachers highly value the acquisition of practical skills. They hold the belief that possessing practical skills is crucial for facilitating the teaching and learning process, allowing them to effectively evaluate their students and achieve the desired learning goals. This viewpoint is consistent with the claims made by Hart-Anderson & Holme (2023), who emphasises the importance of teachers possessing extensive proficiency in managing tools and machinery. She argues that this skill is crucial for fostering teachers' self-assurance, thus improving the efficiency of their teaching methods. It is crucial for D&T teachers to combine practical skills and theoretical knowledge. This is important not only for their own professional confidence but also for successfully using instructional strategies that help students achieve effective learning outcomes (R. Ismail et al., 2022; McLain et al., 2019; Twiner et al., 2022).

Hence, in instructing D&T, the application of practical skills proves beneficial for educators guiding students through project-based learning objectives. Consequently, the demonstration approach is necessary in order to effectively demonstrate the proper utilisation of tools and machinery that are necessary for project construction (Ali et al., 2019). It is essential for students to grasp the functions of these tools and machinery, ensuring their accurate and appropriate utilization (Ali et al., 2019).

## Conclusion

Design and Technology (D&T) education incorporates theoretical knowledge and practical skills to address real-world problems, using a systematic approach facilitated by the latest technology. This curriculum emphasises equipping teachers with a wide range of skills, with a particular focus on seamlessly integrating technology and improving the overall learning experience. However, a deficiency in teachers' incorporation of technology into their instructional methods poses a challenge in meeting the competency requirements aligned with the current digital needs of the Design and Technology (D&T) subject. This issue prompted a systematic literature review that delved into the pedagogical and content knowledge practices of D&T teachers. The review posed a research question and rigorously assessed 24 papers for quality and inclusion/exclusion criteria. The analysis underscored the imperative nature of digital literacy for D&T teachers, encompassing proficiency in information and communication technology (ICT) skills and the adept use of instructional aids from diverse sources. Furthermore, the integration of technology not only entails the capability to employ technological tools and machinery but also involves practical competence, a crucial pedagogical aspect tailored for the D&T subject. Proficiency in handling tools and machinery emerges as a key factor, enabling teachers to effectively demonstrate skills before students embark on their projects. This underscores the necessity for D&T teachers to refine their competency skills to adapt to the ongoing process of digitalization in the education landscape. Additionally, stakeholders are urged to attain teachers' needs, fostering resilience in the face of ever-evolving educational requirements. This comprehensive exploration highlights the multifaceted nature of digital literacy and practical competence crucial for D&T teachers, emphasizing the need for continuous adaptation and support within the dynamic realm of education.

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