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# TPSACK FRAMEWORK DEVELOPMENT IN MEASURING THE TECHNOLOGICAL, PEDAGOGICAL, SKILLS, AND CONTENT KNOWLEDGE OF THE ART AND DESIGN EDUCATION STUDENTS

*a chapter by*

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## Introduction

The emergence of a change in the Malaysian education system involving learning methods based on the use of technology is growing increasingly in line with technological development involving 21st-century learning. Learning with technology has become more relevant to the emergence of change in the Malaysian education system. High technology development now allows information to move unlimited and provides no boundaries. Universities are the main centre for producing competent, efficient, and computer literate students to meet the demands of today's work industry. The advent of ICT in this age of borderless communication has brought innovation to the university students teaching and learning styles to a new level. This scenario affects the visual art area which involves the Art and Design Education (ADE) program at the Faculty of Education, Universiti Teknologi MARA. The educators bear a heavy responsibility in helping the government accomplish its objectives in the 9th Malaysian Plan, namely to generate excellent future generations.

It was observed that students became more interested in learning the subject when teachers incorporated technology into the instruction when teaching. Individual teachers determine the quality of teaching along with the development of the student (Cox, 2008). This is the main reason that ADE students have a strong foundation in their field of expertise, including the pedagogical experience and other skills needed to prepare better before performing the tasks of learning and teaching. It has also been found that teachers with comprehensive knowledge about technology and computer ability, tend to increase a student's level of success.

## Problem Statement

Teachers without a deep understanding of artistic skills will lead to the lesson conducted in the classroom without clear guidance (Teo, 2009). Teachers are learning different pedagogical approaches to relate content in different ways and forms (Pierson, 2001). Teachers working in the art field need knowledge of artistic skills to allow students to understand the skillful application of drawing which will help them to understand perception. That way, learners would learn the knowledge related to skills and how to integrate it into their tasks. The ADE students will face an enormous role in explaining the subject matter to the class when carrying out the lesson. The effectiveness of the subject delivery depends on how well the subject matter is understood and this may be done when a highly qualified person is placed to teach the subject. It has been reported in a study, students tend to lose interest only if the teacher does not deliver the knowledge closed in the subject matter due to a lack of creativity and lack of technological integration ways. The integrated technology in the classroom depends upon the artistic skills embedded, which ultimately influence the student learner's beliefs and ideas. Technology integration in the classroom excites the student to learn and absorb more knowledge and, makes teachers comfortable to promote lessons easily (Schmidt et al., 2009).

## Literature Review

The study has been suggesting the TPACK framework from Mishra and Koehler (2006). The framework in the study led to suggestions on the importance of technological integration with the understanding of proper constructs of technology, pedagogy, and content knowledge. This framework proposed by Mishra and Koehler was not deemed appropriate for boosting ADE students' artistic abilities. As a result, including artistic skills into the existing framework may improve the ADE students' preparation and their teaching abilities in the future. This study has been conducted as an extension of the TPACK framework toward the TPSACK framework for directing the artistic skills needed in the teaching profession for productive lessons and outcomes. Shulman (1987) studied the framework of pedagogical content knowledge (PCK) to provide a clear explanation of the foundation for pre-service teachers implementing pedagogy content knowledge (see figure 1) mainly focusing on the connection of ideas from one another for transforming the understanding of the students while learning.
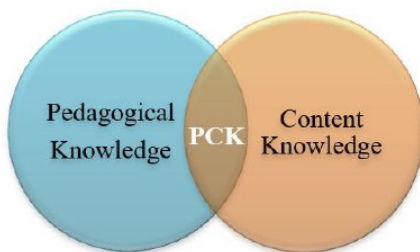


*Figure 1: Shulman's Framework (1987)*

The elements described by Shulman related to the subject were content knowledge, pedagogical content knowledge, and curriculum knowledge to make the students prepare and understand the curriculum properly and the knowledge induced in it. Shulman distinguished between pedagogical knowledge and content knowledge where pedagogical knowledge was related to understanding the patterns of how to teach and content knowledge referred to as an understanding of the subject matter. The knowledge includes knowledge about certain topics of subject matter and how issues can be organized, adapted, and represented in the classroom for students to gauge

their interest and abilities during the learning phase (Shulman, 1987). The concept has further carried a complete description of the framework proposed by Mishra and Koehler (2006), Mishra and Koehler (2008), and Koehler and Mishra (2009) as shown in figure 2.
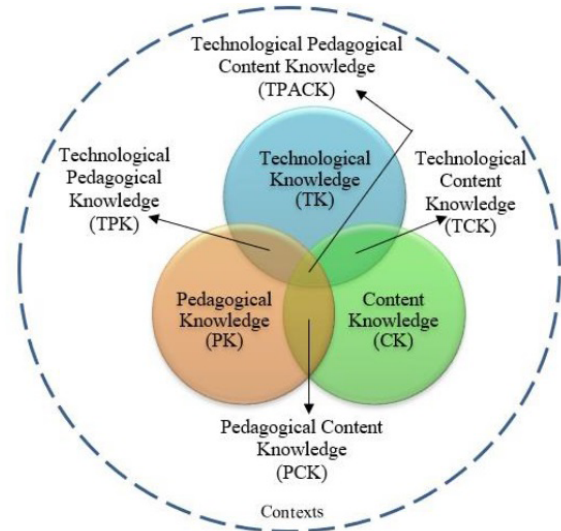


*Figure 2: The TPACK Framework and its Knowledge Components*

Mishra and Koehler performed research in which they added technology as one major component in the PCK framework and designed it as a complete TPACK framework in 2008. Mishra and Koehler (2006) suggested that the framework TPACK does not merely work on the separate role played by the three components of knowledge but a complete understanding takes place when an interplay of relationships exists between them. Only then a meaningful learning process could be evolved. This framework fits in the presence of the ADE students to understand the content, pedagogy, and technology teaching. Technological, Pedagogical, and Content Knowledge (TPACK) has been considered a system for understanding and describing the various types of knowledge needed to integrate technology effectively by ADE students. The framework further emphasizes that teachers require various kinds of understanding to make the integration of technology successful with positive outcomes in the learning process (Koehler & Mishra, 2009).

## An Extension from TPACK to TPSACK

The TPSACK is an extended form of the TPACK framework representing the artistic skills and knowledge in the framework. Artistic skills have been defined as the ability to use art skills and knowledge efficiently. The artistic skills are associated with the ADE subject and strongly support the creativity of the ADE students. This further helps in guiding the ADE students to produce good art skills with a wide understanding and capabilities for task evaluation. Other aspects of the framework such as technology, pedagogy, and content knowledge have been required for technology advocacy to blend the technology with the instructions (Mishra & Koehler, 2008).



*Figure 3: The Technological, Pedagogical, and Content Knowledge (TPACK)*

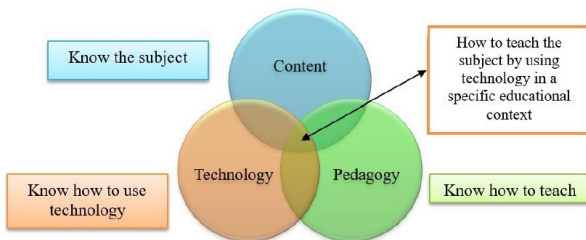The above figure 3 is a representation of Mishra and Koehler's (2006) TPACK framework. The framework improves the technological uses but it is not sufficient to deliver the information for enhancing the artistic skills in ADE students' development and preparation process. The extended framework has been focusing on the process of teaching which improves the artistic skill knowledge of the ADE students in the visual art area. The teaching process involves certain applications of knowledge in various unique structures and perspectives which play out in different ways in some instances (Mishra & Koehler, 2006). Also, it has been examined that an additional component (technology knowledge) in the framework for integrating technology has created complexities in the matter.
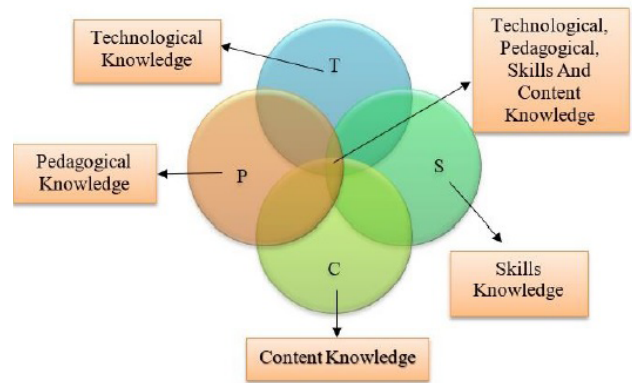


*Figure 4: The Technological, Pedagogical, Skills and Content Knowledge (TPSACK)*

The above-represented figure 4 is an adaption from the TPACK framework of Mishra and Koehler (2008). The addition of the skills component in the original framework enhances the performance of learning with technology. The components overlapping has been focusing on technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK) skills knowledge (SK), and technological, pedagogical, skills, and content knowledge (TPSACK). The importance of artistic skills is heightened to train the ADE students for developing self-efficacy and generating an environment of better art practices with knowledge.

## The Artistic Skills Knowledge Description

The artistic skills knowledge has been playing a significant role in the art profession, particularly which requires certain artistic skills in creativity, and these skills aid in bringing more creativity to arts. The process has gained importance as it provides with certain direction for generating and developing the ADE students' ideas based on their observations. The artistic skills provide the abilities to exercise the potentialities in humans and the sensibility is triggered by observing the meaning of line through visual observations. The teachers of visual arts for interpreting the meaning and for making a remark on their artwork according to their point of view must convey their artistic skills and knowledge (Hopkins et al., 2014).

Artistic skills are something that can be earned and it is the physical execution or performance of a task. Artistic skills can come more naturally to others but are only developed and refined through practice. The best skill example is the 10,000-hour rule made famous by Malcolm Gladwell. The premise is that it takes 10,000 hours of practice to become an expert in any field or study (Zaichkowshy & Angela, 2016). Supported by Iberahim Hassan (2003), teachers are the catalysts to build artistic knowledge and understanding of technology to create and develop disciplines and positive attitudes of the students. Artistic skills are very important in the visual arts area. The ADE students should possess the theory of art before they can gain artistic skills.

## Ways to Model Artistic Skills Knowledge Confidence

The ADE students have been considered perfect role models for artistic skills development. Through their role as future art educators, they bring out the excitement of art on the premises of the classroom. The enthusiasm of teachers motivates the students for thinking like an artist, perfuming the methods of art in their task to express their passion, and positively responding to their students (Kunter, 2011). Teachers should not afraid to take initiative in art activities. For developing skills in any discipline, they need teaching, and then certain situations are given in which they need to apply those artistic skills (Roland, 2010).

The ADE students are required to be prepared before they conduct the teaching and learning of Visual Art Education subjects in school. The artistic skills knowledge is important as it will enable them to model the artistic conversation in listening and responding to the students. The ADE students must be able to listen to the students and generate a meaningful discussion. They should be able to paraphrase, summarize and structure the discussion with the knowledge, vocabulary, and new ideas according to the terms and requirements of the visual arts.

## Technological, Pedagogical, Skills and Content Knowledge (TPSACK)

The blend of skills in TPACK to TPSACK contributes to improving the practices in the learning environment. The ADE students as suggested by the TPACK framework before the creation of a learning environment are preferred technological, pedagogical, and content knowledge as support. The skills knowledge inputs and challenging learning environment for the ADE students as well as their future students will be established where knowledge will play a key role. The inclusion of skills and knowledge in the framework generated an effective environment for learning to facilitate the process.

The kinds of knowledge are described in the TPACK framework that is required by the ADE students to teach with technology and the difficult ways in which these aspects of knowledge engage with one another. This develops on the approach, which explains how and why the ADE students' knowledge of content and pedagogy cannot be referred to only in isolation. Therefore, the requirement empowering the engagement between content and pedagogy for implementing initiatives that assist the ADE students in comprehensively understanding the content. A major change in current pedagogical and content domains is required for better teaching with technology. The role of the context throughout teaching and learning is also emphasized in the TPACK framework. Avoiding context drives generic solutions to the problem of teaching. Technology is used for designing learning experiences subjected to pedagogies when teaching is a context-bound activity and shaped for content as offered in learning contexts.

## The framework

The kinds of knowledge are described in the TPSACK framework that is required by ADE students for them to teach with technology and the difficult ways in which these aspects of knowledge engage with one another. Technological knowledge entails an understanding of how to use computer hardware and software, presentation tools, and other technologies in educational contexts. Technological knowledge comprises

the competence to adapt to and integrate new technologies and it is explained briefly below:

*Technological Knowledge (TK)*

Technological knowledge entails an understanding of how to use computer hardware and software, presentation tools, and other technologies in educational contexts. Technological knowledge comprises the competence to adapt to and integrate new technologies.

*Content Knowledge (CK)*

Content knowledge is considered the knowledge or nature of a subject or discipline matter. Content knowledge differs majorly between teachers' mastery and several educational contexts. Content knowledge is also essential as it reveals the discipline-particular modes of thinking specifically to each field.

*Pedagogical Knowledge (PK)*

Pedagogical knowledge is explained as the general objective knowledge intended for teaching. It is a cluster of skills that must be developed by teachers for managing and organizing teaching and learning activities for aimed learning outcomes.

*Pedagogical Content Knowledge (PCK)*

Pedagogical content knowledge reflects that better teaching needs more than an individual understanding of pedagogy and content. Pedagogical content knowledge further asserts that different content allows for different methods of teaching. For instance, student-centered activities are required to teach speaking skills for a foreign language teacher where students involve in substantial and authentic communicative tasks.

*Technological Content Knowledge (TCK)*

Technological content knowledge explains the knowledge of the reciprocal association between content and technology. Technology influences what is already known and instigates new offerings as to how specific content can be represented in new ways that were not possible prior. For instance, nowadays the relationship between elements and principles of arts is much easier to learn by interacting and touching with these aspects on handheld screens or portable devices.

*Technological Pedagogical Knowledge (TPK)*

Technological pedagogical knowledge refers to the reciprocal association between pedagogy and technology. This knowledge allows understanding of what technology can do for specific pedagogic objectives and for teachers to choose the most adequate tool based on its usability for the certain pedagogical approach.

*Technological Pedagogical Content Knowledge (TPCK)*

Technological pedagogical content knowledge explains the synthesized knowledge of each of the subjects of knowledge demonstrated in the previous sections with an emphasis on how technology can be exclusively shaped for meeting pedagogical requirements for teaching specific content contexts.

*Artistic Skills Knowledge (SK)*

Artistic skills in the TPSACK framework may be addressed perfectly because the art is represented by each individual ideas, thoughts, and preferences which are not like another individual's (Gopnik, 2012). The artistic skills knowledge helps in overcoming the existing gap in the TPACK framework and how this artistic skills knowledge advocated the ADE students teaching and learning process. Moreover, DePlatchett (2008) stated visual arts learning is an enriching experience for students by adding technology to the process which eventually enhances the learning experience.

**TPSACK and the ADE Students**

The TPSACK framework suggested the production of effective learning outcomes which would assist the ADE students in understanding the concept of pedagogy, technology, skills, and content knowledge. A clear vision of TPSACK aids in the building of the appropriate artistic

skills and knowledge so that they can develop meaningful learning experiences by integrating the technology efficiently for their learning. The teachers develop the TPACK for designing technology in accordance with the context. This will give the confidence to teachers to understand the diverse students and their relative needs. This ultimately brings pre-service teachers confidence while delivering the subject (Schmidt, 2009).

## Conclusion

The framework required different needs to assess the artistic knowledge virtually and to assist the ADE students in improving their artistic skills knowledge. The framework has improved the understanding of the ADE students to better learn through the framework and the association within the components. Therefore, within the advocacy of the theories, the TPSACK framework has been developed for the understanding of artistic abilities development among ADE students as future art teachers.

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