



## Technology integration in thematic learning to welcome the era of the industrial revolution 4.0 in elementary schools

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**Abstract:** Advances in technology have become the focus of basic education today. Elementary school-age children are already adept at using technology in everyday life, including in meeting their needs. The purpose of this study is the analysis of the integration of technology in thematic learning to approach the era of the industrial revolution 4.0 in elementary schools. Research that has been conducted uses a qualitative approach with the case studies method. The results showed that children who grow and develop with technological advances easily follow learning by integrating technology into thematic learning in primary schools. Whereas children who grow and develop by not following technological advances have difficulties and awkwardness in learning by integrating technology in thematic learning in primary schools.

**Keywords:** technology, thematic learning, industrial revolution 4.0, primary school, basic education

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## **INTRODUCTION**

The development of technology has become a habit that is inseparable from human activities, including in the environment of elementary school children (Bahng & Lee, 2017; Mikerova, Sergeeva, Mardirosova, Kazantseva, & Karpenko, 2018; Ryoo & Bedell, 2019). Elementary school-age children occupy themselves with technology-related activities, such as activities using social media, YouTube, online games, and various applications on smartphones (Cooper Stapp & Kate Karr, 2018; Hendrizal & Chandra, 2018; Pekince & Avci, 2018; Turan & Meral, 2018). Involving technology in the learning process in primary schools raises the assumption that it will benefit children (Mikerova et al., 2018; Ryoo & Bedell, 2019; Turan & Meral, 2018). Children feel motivated, obtain satisfying learning outcomes, and create a pleasant learning atmosphere in the thematic learning process, learning following the applicable curriculum in Indonesia (Hendrizal & Chandra, 2018).

Fun thematic integrated technology learning makes it easy for students to improve their knowledge and skills and is supported by professional teachers (Budde & Weuster, 2017; Feistauer & Richter, 2017; von Wangenheim et al., 2018). Professional teachers must apply the main tasks in the thematic learning process, namely educating, teaching, guiding, directing, training, assessing, and evaluating students (Brilingaite, Bukauskas, & Juškeviciene, 2018; Gholami & Qurbanzada, 2016; Zahorec, Haskova, & Munk, 2014). Students feel meaningful learning with the application of the maximum professional teacher assignments (Bahng & Lee, 2017; Granger, Bevis, Southerland, Saka, & Ke, 2019; Lane, Hardison, Simon, & Andrews, 2019; Turner, Christensen, Kackar-Cam, Fulmer, & Trucano, 2018).

Based on the problems found in Indonesian elementary schools, the observation data shows that there is still a lack of involvement of technology in thematic learning. Elementary school-age children in Indonesia are already familiar with various technological developments, both in urban and rural environments. Urban children are already using social media as the main means of communication. Rural children have started to be busy with online games. These phenomena that occur in the child's environment become a social spotlight that needs to be considered for the future, so it is necessary to study the integration of technology in thematic learning in urban and rural elementary schools.

## **METHODS**

The approach used in this study is qualitative. The study was conducted to understand the phenomena about everything experienced by the research subjects, namely behavioral perception, motivation, and action. This type of research uses case studies in urban and rural elementary schools by collecting data, making meaning, and gaining an understanding of the case. The selection of research samples used purposive sampling technique. Data collection techniques using data triangulation, namely observation, interviews, and documentation studies. Data analysis techniques by reducing, display data, and conclusion drawing/verification. The study was conducted with a preparation phase, an implementation phase, a data validity stage, and a reporting stage.

## **RESULT AND DISCUSSION**

### **Curriculum Analysis Results in Indonesia**

Analysis of curriculum development in Indonesia shows the results that curricula that have been applied and used, namely the Simple Curriculum in 1947, the Advanced Simple Curriculum in 1968, the Objective-Based Curriculum in 1975, the Process Skill-Based Curriculum in 1984, the Material-Based Curriculum in 1994, Competency-Based Curriculum in 2004, Education Unit Level Curriculum in 2006, and National Curriculum in 2013 until now. The National Curriculum applies thematic learning processes in elementary

schools. The balance between attitudes, skills, and knowledge to build soft skills, and hard skills of students varies between students at the elementary school level, junior high school, high school / vocational high school, and college. Focus on students in primary school, soft skills and hard skills of students who developed more to the attitude, second's skills, and less knowledge.

The national curriculum has core competencies that must be achieved at every level of the class. Students in primary schools must master spiritual attitude competencies, social attitudes, knowledge, and skills. Students in first-grade and second-grade elementary schools must master the spiritual attitude competence, which is to accept and practice the teachings of the religion they hold. Students in grade one and grade two of elementary school must master social attitude competencies, namely: honesty, discipline, responsibility, courtesy, caring, and self-confidence in the family, friends, and teachers. Students in grade one and grade two of elementary school must master knowledge competence, which is understanding factual knowledge and observing and asking questions in the home and school environment. Students in grade one and grade two of elementary school must master competency skills, namely presenting factual knowledge in clear and logical language, aesthetic work, healthy movements, and noble moral actions.

Students in third-grade and fourth-grade elementary schools must master the spiritual attitude competence, which is to accept and practice the teachings of their religion and respect their religion. Students in third-grade and fourth-grade elementary schools must master social attitude competencies, namely: honesty, discipline, responsibility, polite, caring, and confident in the family, friends, teachers, and neighbors, as well as increasing from time to time. Students in third-grade and fourth-grade elementary schools must master knowledge competencies, namely understanding factual knowledge and observing and asking questions in the home, school and playing environment, as well as increasing from time to time. Students in third-grade and fourth-grade elementary schools must master the competency of skills, which presents factual knowledge in clear and logical language, aesthetic work, healthy movements, noble moral actions, and occur systematically, and have increased from time to time.

Students in the fifth-grade and sixth-grade of elementary schools must master the competence of the spiritual attitude, which is to accept and practice the teachings of their religion and respect their religion. Students in the fifth-grade and sixth-grade of elementary school must master social attitude competencies, namely: honesty, discipline, responsibility, polite, caring, confident, and love the motherland in the family, friends, teachers, and neighbors, and experience an increase in time after time. Students in the fifth-grade and sixth-grade of elementary schools must master knowledge competencies, namely understanding factual and conceptual knowledge and observing, asking, and trying activities in the home, school, and playing environment, and increasing from time to time. Students in the fifth-grade and sixth-grade of elementary schools must master the competency of skills, namely presenting factual and conceptual knowledge in clear and logical language, aesthetic work, healthy movements, noble moral actions, critical, and systematically occurring, as well as increasing from time after time.

The structure of the primary school curriculum consists of learning content components for Religious and Character Education, Pancasila Education, and Citizenship, Indonesian Language, Mathematics, Natural Sciences, Social Sciences, Art, Culture, and Crafts, and Physical Education, Sports, and Health. The amount of time spent in the learning process in the first grade of primary school in one day, which is 30 hours of learning. The amount of time spent in the learning process in the second grade of an elementary school in one day, which is 32 hours of learning. The amount of time spent in the learning process in third-grade elementary school in one day, which is 34 hours of learning. The amount of time spent in the learning process in grades four, five, and six primary schools in one day, which is 36 hours each.

The uniqueness of the book for thematic learning in primary schools uses the national curriculum by highlighting figures who have different cultural, religious, and racial

differences in Indonesia. The learning steps are applied in the thematic learning process, which is following the learning steps using a scientific learning model. The steps of the scientific model, namely observing, questioning, associating, experimenting, and networking.

### **Results of Technology Integration in Thematic Learning in Cities**

Based on observations using observation sheets, anecdotal notes, unstructured interview processes, and documentation studies that have been conducted in several primary schools in Padang, Solok, Pariaman, Sawah Lunto, Padang Panjang, Bukittinggi, and Payakumbuh, West Sumatra Province, Indonesia was found that elementary school-age students were preoccupied with smartphones in their daily lives. Students spend a lot of time communicating using social media. Some students have smartphones with their parents' permission. Some students use smartphones owned by parents and relatives to open social media accounts and play online games. This activity shows that students are very familiar with technology and always keep up with technology.

Another unique thing is found based on interviews that there are children who follow technology but he has parents who are less concerned with technological development. So that parents can easily master smartphones to play online games and social media. Some parents are proud of the greatness of their children using smartphones. Some showed anxiety for their children with the advent of technology in the form of the internet. Some parents prefer to let their children 24 hours indoors with online gaming activities rather than socializing outside the home.

Based on observations in the thematic learning process using the national curriculum and scientific learning steps, Problem Based Learning, Discovery Learning, and Project-Based Learning in elementary schools, it was found that learning processes often use technological developments as media and tools in the learning process. The commonly used tool, the Liquid Crystal Display to show learning videos, learning images, and classically learning the material. Learning outcomes also show remarkable achievements, so the minimum completeness criteria are quite high in urban elementary schools. Urban students also often win elementary school level knowledge contests. It's just that learning still lacks new ideas for students in developing their skills. Meanwhile, to minimize the negative influence of technology on children's development, some schools apply rules to prohibit students from carrying smartphones.

### **Results of Technology Integration in Thematic Learning in Rural Areas**

Data were analyzed sourced from research conducted in Pariaman District, Padang Pariaman District, Solok District, South Solok District, Pasaman District, West Pasaman District, Agam District, Lima Puluh Kota District, Tanah Datar District, Sejunjung District, Darmasraya District, and Mentawai District. The results showed that since the internet program entered the village, elementary school-age children have begun to be influenced by technological developments. Traditional children's games are slowly being abandoned. Now parents have been found to facilitate their children by providing internet networks in their homes. Some children still use internet cafes as a place to use their social media and online games.

The learning process has been facilitated by several schools with Liquid Crystal Display. But there are still many schools that do not use the facilities provided. Students get the most learning material still the old way, especially schools far from the district center. While many schools in the district center use Liquid Crystal Display media as a tool and learning media in showing videos, pictures and thematic learning materials using science in the national curriculum.

### **Discussion**

The results of the analysis of professional teacher assignments show that the main task of professional teachers is educating, teaching, guiding, directing, training, assessing, and evaluating students. Teacher levels are developed into four types, namely ordinary teachers, good teachers, great teachers, and greatest teachers (Hendrizaral & Chandra, 2018; Muhammadi, Taufina, & Chandra, 2018; Nelly, Taufik, & Irdamurni, 2019). An ordinary teacher is a teacher who conveys learning by giving priority to information knowledge from teacher to student without regard to the presence or absence of responses from students (Chandra, Mayarnimar, & Habibi, 2018; Mayarnimar & Taufina, 2017; Taufina, 2017). The teacher was found to be more talkative. Even what happens in the learning process talks about the less related to the learning material being discussed.

A good teacher is a teacher who focuses on explaining the learning material completely (Putra & Taufina, 2019; Sari, Taufina, & Nirwana, 2018; Taufina & Chandra, 2017; Taufina, 2017). The learning process like this is called the learning process that is the student center. The great teacher is the teacher who demonstrates every knowledge delivered to students (Putra & Taufina, 2019; Sapitri, Mudjiran, & Taufina, 2019; Wedia Putra, Taufina, & Adnan, 2019). The demonstration process can be carried out using various learning tools and media. The greatest teacher is a teacher who inspires students in the learning process.

Ordinary teachers and good teachers are grouped into teachers who carry out tasks in an old-fashioned way, namely teaching and offering students with information load of knowledge and the teacher is seen to know best as if the only source of information (Nelly et al., 2019; Putra & Taufina, 2019). Great teachers and greatest teachers are grouped into teachers who carry out their assignments in new ways, that is, teachers do not know best, teachers teach by following student learning styles, and try to get information from various sources to facilitate student needs (Mayarnimar & Taufina, 2017; Taufina & Chandra, 2017; Taufina, 2017).

The teacher's behavior is usually characterized by the characteristics of lecturing a lot of students, paying less attention to students' needs, not listening to students' complaints, and often threatening students (Mayarnimar & Taufina, 2017; Muhammadi et al., 2018; Taufina & Chandra, 2017). Great teacher behavior and great teacher shows little attitude in lecturing in delivering learning material, often observing students' needs, always listening to students' complaints, and being open to students' mistakes (Putra & Taufina, 2019; Sari et al., 2018; Taufina & Chandra, 2017). These signs also begin to be found in good teachers.

Primary schools in Indonesia implement thematic learning (Hendrizaral & Chandra, 2018). Thematic learning uses a scientific learning model with stages: observing, questioning, associating, experimenting, and networking (Baharudin, 2015; Camilleri, 2017; Hendrizaral & Chandra, 2018; Hughes, Hall, & Pozzie, 2017; Levine, 2019; Schüller, Birnbaum, & Kröner, 2017). Thematic learning combines several learning contents, namely Indonesian learning content, Pancasila Education, and Citizenship, Mathematics, Natural Sciences, Social Sciences, Arts, Culture, and Crafts, and Physical Education, Sports, and Health (Hendrizaral & Chandra, 2018).

Learning Indonesian content, specifically in the process of learning to read and write has a process that should be applied (Arfé, Mason, & Fajardo, 2018; Beker, van den Broek, & Jolles, 2019; Stang Lund, Bråten, Brandmo, Brante, & Strømsø, 2019; Walgermo, Foldnes, Uppstad, & Solheim, 2018). The process of learning to read, namely pre-reading, when reading, and post-reading (Collins, Lee, Fox, & Madigan, 2017; D'Agostino, Rodgers, & Mauck, 2018; Foster, Ardoin, & Binder, 2018; Gouldthorp, Katsipis, & Mueller, 2018; Kalindi, McBride, & Dan, 2018). Pre-reading has activities that must be carried out, namely conveying the purpose of reading, predicting the contents of reading, the existence of shadow clues, there is an introduction, and making the semantic mapping (Cheng et al., 2017; Muhammadi et al., 2018; Rodgers, D'Agostino, Harmey, Kelly, & Brownfield, 2016; Schüller et al., 2017). When reading has activities that must be done, namely making cognitive meta, asking questions that guide knowledge, proving the results of predictions, and close procedures (Beker et al., 2019; Rodgers et al., 2016; Schiefele & Löweke, 2018).

Post-reading has activities that must be carried out, namely expanding learning, answering questions, and retelling important aspects (Arfé et al., 2018; Beker et al., 2019; Chandra et al., 2018; Gouldthorp et al., 2018; Walgermo et al., 2018). The learning process of writing, namely prewriting, writing, revision, editing, and publication (Ahangari & Sepehran, 2014; Habibi & Chandra, 2018a; Li & Zhu, 2017; Marashi & Tahan-Shizari, 2015). Activities in the prewriting process, namely choosing a topic to be written, setting goals and objectives of writing, gathering material following the writing idea, and creating a writing framework (Ahangari & Sepehran, 2014; Habibi, Chandra, Mahyuddin, & Hendri, 2018; Sulak, 2018; Tok, 2015; Yamaç, 2015).

Each learning content has important things to do in the learning process (Camilleri, 2017; Dorça, Araújo, de Carvalho, Resende, & Cattelan, 2016; Rijke, Bollen, Eysink, & Tolboom, 2018). The learning content of Natural Sciences has stages that need attention: facts, concepts, principles, and law (Baumfalk et al., 2019; Granger et al., 2019; Kim, 2018; Krist, Schwarz, & Reiser, 2019; Lane et al., 2019; Magulod, 2019; Walsh & Tsurusaki, 2018). The learning content of Pancasila Education and Citizenship and Social Sciences has the same stages and needs to be considered: facts, concepts, generalizations, and values (Gutiérrez & Jurow, 2016; Horn, 2018; O'Neill, 2016; Rienties & Tempelaar, 2018; Smirnov, Easterday, & Gerber, 2018). The content of mathematics learning must pay attention to concepts, find formulas, problem-solving, and reasoning (Allen-Lyall, 2018; Mikerova et al., 2018; Nelly et al., 2019; Pantzare, 2015).

## CONCLUSION

Based on research conducted, the results of the study show that children who grow and develop with technological advances easily follow learning by integrating technology into thematic learning in primary schools. Whereas children who grow and develop by not following technological advances have difficulties and awkwardness in learning by integrating technology in thematic learning in primary schools. The integration of technology in thematic learning to welcome the era of the industrial revolution 4.0 in elementary schools in urban and rural areas needs to be considered to improve the quality of education in Indonesia

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