

Adopting the Thoughts of Ibn Sina and Thomas Kuhn in Character Education Based on Digital Technology to Improve Creativity and Innovation of Elementary School Students

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ABSTRACT

Nowadays digital technology-based learning is increasingly developing in the world of education, especially in improving students' creativity and innovation. This study aims to analyze the relationship between the thoughts of Ibn Sina and Thomas Kuhn in digital technology-based learning with the level of creativity and innovation of elementary school students. The thoughts of Ibn Sina, which emphasizes education based on ethics and intellectuals, and Thomas Kuhn, who carries the concept of paradigm shift in thinking, are used as the basis for understanding how digital technology can be optimally applied to improve students' creativity. This study uses a quantitative approach with a descriptive correlational design. Data were collected through questionnaires given to elementary school teachers and students who have implemented digital technology-based learning. The data analysis technique used descriptive statistics and Pearson's correlation test to see the relationship between the variables of Ibn Sina and Thomas Kuhn's thoughts with the level of creativity and innovation of students. The results of the study showed that there was a significant relationship between the approach based on the thoughts of Ibn Sina and Thomas Kuhn with the creativity and innovation of elementary school students. Ibn Sina's thoughts contribute to the formation of students' character and ethics in using technology, while Thomas Kuhn plays a role in encouraging a more innovative paradigm shift in thinking in learning.

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Introduction

Education is an important part of human life. Every individual needs to develop themselves through increasing knowledge and understanding in various aspects of life. This

increase in knowledge and understanding will later play a role in increasing individual competence to be able to increase competitiveness in facing the demands of future life (Voinea, 2019; Lilia & Elena, 2019). One way to increase this competence is through the education process. Education is a process of changing behavior, adding knowledge and life experience so that students become more mature in thinking and attitude (Basha, 2017; Lotz-Sisitka, et al., 2017). Education in this digital era is developing very rapidly, even advances in technology are not only in demand and enjoyed by adults but also elementary school children. In the world of education, technology is widely used as a means and infrastructure for interaction between educators and students. Education is also not only a means of distributing knowledge but also a means of acculturation and distribution of values (enculturation and socialization) (Efendi & Ningsih, 2019).

Character education is an educational process that aims to shape the personality and morals of students through the development of positive values. According to Gunawan (2022), character education functions to shape individuals who have noble and responsible morals. According to Ibn Sina a muslim philosopher, character education is a process that involves the development of individual morals and ethics. In his view, education is not just a transfer of knowledge, but also a process of forming morals and ethics. Ibn Sina believed that education should include the development of reason and soul, so that individuals can achieve wisdom and goodness. Character education, according to Ibn Sina, is an effort to instill moral values that will guide individuals in living a good and meaningful life (Rahman, 2020; Raman, 2025). Kuhn (1996) stated that character education can be seen as a new paradigm in education that emphasizes moral values.

Thomas Kuhn, a philosopher of science, is known for the concept of "paradigm" in the development of science. Although Kuhn did not directly discuss character education, his thoughts on paradigm shifts can be applied in the context of character education. Character education can be seen as a new paradigm in education that emphasizes the importance of moral and ethical values in the teaching and learning process. Kuhn argued that a paradigm shift occurs when society begins to realize that old approaches are no longer adequate, and character education can be a solution to forming better individuals in society (Sari, 2019; Matthews, 2024).

The development of digital technology has brought significant changes in the world of education, especially in efforts to improve student creativity and innovation. The use of digital technology in elementary schools not only helps in delivering learning materials, but also encourages students to think creatively and innovatively in solving problems (Prensky, 2010). However, the main challenge in implementing digital technology is how to ensure that its use is not only technical, but also forms students' character in accordance with strong educational values.

Several previous studies have shown that the integration of character values in technology-based learning can improve students' critical and innovative thinking skills (Mishra & Koehler, 2006). In addition, a paradigm shift-based approach can help students to be more flexible in understanding and applying new concepts in learning (Collins & Halverson, 2018). However, there is still limited research that specifically connects the thoughts of Ibn Sina and Thomas Kuhn with digital technology-based learning at the elementary school level, especially in the context of student creativity and innovation.

These two thinkers can be connected in the context of character education and the application of digital technology. Character education emphasized by Ibn Sina can be integrated with digital technology to create a learning environment that supports the development of student character. For example, the use of learning applications that teach

moral and ethical values, as well as collaborative platforms that encourage students to work together on projects that benefit society. The application of digital technology in elementary education can increase student creativity and innovation. By using digital tools such as learning software, creative applications, and social media, students can explore new ideas and collaborate with their friends. This is in line with Kuhn's view of the importance of a paradigm shift in education to encourage innovation (Pratiwi, 2021).

Character education at the elementary school level is an important aspect that is often overlooked by teachers and parents, even though its role is very crucial in shaping students' personalities and morality. In Bogor City, this challenge is further exacerbated by the fact that many students have not mastered the technology that can be used for learning, thus hindering their potential to innovate and be creative. In addition, teachers and parents still tend to ignore the use of digital technology that can support the teaching and learning process, which should be able to increase student engagement in learning. On the other hand, teachers have not fully improved and developed effective learning strategies, which can integrate character education with digital technology. In this context, Ibn Sina's thoughts emphasizing the importance of holistic and moral education, as well as Thomas Kuhn's views on paradigm shifts in education, can be a strong foundation for overcoming these challenges and creating a more innovative and creative learning environment for students.

Method

This study uses a quantitative method with a questionnaire survey and questionnaires. The approach used is quantitative, with a descriptive correlational research design. This approach aims to measure the relationship between the thoughts of Ibn Sina and Thomas Aquinas, local cultural values of Bogor City, and the effectiveness of character education in Elementary Schools.

Population and Sample

The population in this study were teachers and students of public elementary school at Kedung Badak District, Bogor City, especially those who focus on the implementation of character education. The sample used was determined by purposive sampling technique, namely selecting schools that implement character education based on local culture, with the number of respondents, as many as 18 Elementary School teachers and 284 Elementary School students.

Research Instruments

The instrument used is a closed questionnaire with a Likert scale (1-5). This scale is designed to provide a clearer picture of the level of respondent agreement or disagreement with each statement, where 1 indicates "strongly disagree" and 5 indicates "strongly agree". The use of the Likert scale in this study is in line with the opinion of Rensis Likert (1932) who stated that this scale is effective in measuring individual attitudes, opinions, and perceptions. In addition, research by Devellis (2016) and Lamm et al. (2020) also shows that the Likert scale can provide reliable and valid data for quantitative analysis. This instrument is used to measure: 1) Teachers' understanding of the thoughts of Ibn Sina and Thomas Aquinas; 2) Application of local cultural values in character education; 3) The effectiveness of character education in schools; 4) Documentation to support quantitative data, such as character education programs implemented in schools.

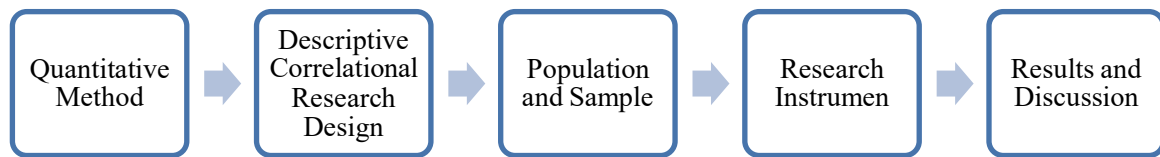


Figure 1. Research Flowchart

Results and Discussion

Validity Test

The validity test of the questionnaire was conducted by distributing questionnaires to 30 respondents at the beginning of the study. The questionnaire given contained 15 statements, then the data was processed and tested using SPSS. The calculated r value of each statement item was compared with the r table value with a significance value of 0.05, then the r table value was obtained 0.361. The test results of statement items 1 to 15 in the questionnaire were declared valid because the calculated r value obtained was greater than the r table value. Thus, the questionnaire can be used in research to measure the relationship between the thoughts of Ibn Sina and Thomas Kuhn with the creativity and innovation of elementary school students in digital technology-based learning. The results of the validity test can be seen in Table 1.

Table 1. Validity Test Results

No.	r Table	r Count	Sig	Information
1	0.361	0.575	0.001	Valid
2	0.361	0.523	0.003	Valid
3	0.361	0.418	0.022	Valid
4	0.361	0.452	0.012	Valid
5	0.361	0.643	0.000	Valid
6	0.361	0.649	0.000	Valid
7	0.361	0.672	0.000	Valid
8	0.361	0.554	0.002	Valid
9	0.361	0.701	0.000	Valid
10	0.361	0.607	0.000	Valid
11	0.361	0.470	0.009	Valid
12	0.361	0.534	0.002	Valid
13	0.361	0.604	0.000	Valid
14	0.361	0.672	0.000	Valid
15	0.361	0.537	0.002	Valid

Reliability Test

After the statement items are declared valid, then continued with a reliability test to determine whether the questionnaire is worthy of being distributed to respondents or not. In the questionnaire reliability test, all statement items are declared reliable if they have a coefficient value that exceeds the Cronbach's Alpha value, which is >0.60 . The results of the questionnaire reliability test are declared reliable because each item has a value that exceeds the Cronbach's Alpha value, which is >0.60 . These results indicate that the items in the instrument have good internal consistency, so that they can provide stable and reliable measurement results in research. The results of the reliability test can be seen in Table 3.

Table 2. Reliability Test Results

No.	Cronbach's Alpha Value	Information
1	0.728	Reliable
2	0.734	Reliable

No.	Cronbach's Alpha Value	Information
3	0.737	Reliable
4	0.737	Reliable
5	0.727	Reliable
6	0.726	Reliable
7	0.727	Reliable
8	0.731	Reliable
9	0.726	Reliable
10	0.730	Reliable
11	0.736	Reliable
12	0.733	Reliable
13	0.730	Reliable
14	0.731	Reliable
15	0.732	Reliable

Interview Results, Observations and Documentation

Teachers in elementary schools integrate moral and ethical values in various activities, such as flag ceremonies, religious lessons, and extracurricular activities. Students are more sensitive to politeness, honesty, and mutual respect after the character education program is implemented. Project-based learning helps students develop creative skills. Students' participation in various competitions such as science, art, and technology competitions provides space for students to innovate. Classes with a learning atmosphere that supports the exploration of ideas produce students who are more willing to take risks in thinking.

Teachers have started using digital technology, such as Kahoot learning applications, Google Classroom, interactive videos, and online quizzes to make learning more interesting even though there are still infrastructure constraints in some schools, such as unstable internet connections or lack of devices. Teachers use collaborative learning methods, group discussions, and simulations to enhance student understanding. Activities such as role play and hands-on experiments increase student interest in learning and make students more active in class. The results of the study showed that most respondents 55.5% of respondents agreed that character education at the elementary school level is very important in building students' moral and social foundations. However, only 44.5% of respondents felt that character education had been implemented effectively in schools. This shows a gap between the understanding and implementation of character education.

According to Ibnu Sina, education does not only focus on academic aspects, but also on moral and ethical development (Rahman, 2020; Chowdhury, 2018). Character education at the elementary school level is very important in building students' moral and social foundations. Responsibility and discipline are top priorities in the implementation of character education. Kuhn (1996) argues that a paradigm shift in education is needed to encourage innovation. Therefore, schools need to integrate technology training into the curriculum to ensure that students can use technology effectively. With this description, it means that innovative and creative students can be realized through learning activities that involve the use of digital technology and facilitate students to collaborate in groups and think critically.

The results of the study showed that 83.3% of respondents agreed that collaboration between teachers and parents in the use of digital technology is very important. However, only 16.7% felt that communication between teachers and parents regarding the use of digital technology was going well. This indicates the need for increased cooperation between teachers and parents in monitoring and guiding students in the use of technology. According to research by Sari (2019), good collaboration between teachers and parents can create a

more positive and productive learning environment for students. Collaboration between teachers and parents in the use of digital technology can help students use technology positively and productively. Teachers guide the application of digital learning media and parents control the use of gadgets so that they are not excessive. In reality, many learning strategies used by teachers are still conventional and lack variety. Although many have used various learning strategies that can help students develop cognitive, emotional, and character intelligence, only 50% feel that teachers have implemented innovative learning methods. This is in line with Ibn Sina's view which emphasizes the importance of a holistic approach in education (Gunawan, 2022). Therefore, training for teachers in developing more creative and innovative learning strategies is very necessary. Diverse learning strategies allow students to develop strong cognitive, emotional and character intelligence in a balanced manner. Project-based learning, group discussion methods and the use of digital media are top priorities.

Conclusion

The results of the study indicate that there is a significant relationship between the approaches based on the thoughts of Ibn Sina and Thomas Kuhn with the creativity and innovation of elementary school students. Ibn Sina's thoughts contribute to the formation of character and ethics of students in using technology, while Thomas Kuhn plays a role in encouraging a change in the paradigm of thinking that is more innovative in learning. From the results of this study, it can be concluded that although there is awareness of the importance of character education and digital technology, there is still a gap in its implementation in elementary schools in Bogor City. Therefore, collaborative efforts are needed between teachers, parents, and schools to improve character education and utilize digital technology effectively in learning. By adopting the thoughts of Ibn Sina and Thomas Kuhn, it is hoped that character education and innovation can be well integrated, so that students can develop into creative and characterful individuals.

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