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Islamic-Based Knowledge Management and Project-Based Learning for Enhancing Students' Creative Thinking

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Abstract
This study investigates how integrating Islamic educational values with knowledge management and Project-Based Learning (PjBL) can strengthen students' creative thinking in the Industrial 4.0 era. Employing a Research and Development (R&D) approach based on Borg and Gall, the research used a quantitative method across five senior high schools in West Java with 316 student participants. Data were collected using validated questionnaires (Cronbach's α = .944) and analyzed using descriptive statistics and ANOVA in SPSS 21. The results reveal that PjBL integrated with Islamic values—such as ihsan (excellence), amanah (responsibility), and istiqamah (steadfastness)—effectively improves students' creative thinking skills. No significant differences were found among the schools, indicating consistent model effectiveness. This study emphasizes that combining Islamic values with modern pedagogical and knowledge management strategies prepares students for the challenges of the Industrial 4.0 era while nurturing moral and intellectual excellence.

Keywords
Islamic Education; Project-Based Learning; Knowledge Management; Creative Thinking

I. Introduction

The world of education experienced very difficult challenges and trials in 2020, due to the Covid19 pandemic. From this outbreak we take lessons to evaluate and change our educational paradigm, especially in the learning process, namely from traditional methods to technological methods or what we call the era of industrial revolution 4.0. The ability to think creatively is very necessary so that the competence of our human resources is not inferior to other nations. As is known, the basic foundations of thinking have generally not been mastered well by students. Several research results show the low thinking abilities of high school students, undergraduate students, and even master's students (Rofi'uddin , 2009).

The development of the times entering the Industrial Revolution 4.0 which relies on *cyber-physical systems* invites education and culture actors to adapt to these developments. School reform, increasing teacher capacity and professionalism, a dynamic curriculum, reliable facilities and infrastructure, and superior learning technology are a necessity in our education. Speed and accuracy are the keys to facing these changes. However, the management of imaginative learning actions will occur productively and successfully in the department The factor is the educator's skills in being competent in educational administration through progress by doing it seriously settings, and hands-on experiences that will encourage sharing and further development of people and groups of students level of information (Chantarasombat, 2007). It is important to further develop the improvement of educators by empowering them increasing the ability to obtain board actions and

imaginative reasoning regarding learning plans appropriate practice for students. Many researchers (Kersensteiners, 1925; Hibnere, 1998; Lubart and Georgsdottir, 2004) noted that the tremendous impact caused by refreshing and fostering students' creativity can be implemented through the character of a teacher and educational nature.

A study conducted by Ucus (2017) shows that educators are very active in supporting students' creative reasoning abilities in the classroom. According to Nami , Marsooli , and Ashouri (2014), students' creative reasoning abilities basically have a definite relationship with student achievement. Eishani , Saa'd , and Nami (2014) determined that students' innovative reasoning abilities are all related to students' learning styles in terms of emotional experiences, conceptual ideas, dynamic experiments, and intelligent perception. It didn't last long before there were still detailed explanations regarding the characteristics of students' creative reasoning abilities in previous studies. Gantasala and Gantasala (2009) found that visual, auditory and sensation learning styles, as the three recipients of touch, are aspects of student learning styles. Alkathiri , Alshreef , Alajmi , Alsowayan , and Alah -mad (2018); Polat , Peker , Ozpeynirci , and Duman (2015); Niculescu , and Usaci (2015); Magdalene (2015); Rezaeinejad , Azizifar , and Gowhary (2015); Yee, Yunos , Othman, Hassan, Tee, Mohamad (2015); Omar, Mohammad, Paimin , (2015); In addition, Gogus and Ertek (2016) introduced that student learning styles are associated with student achievement. According to Pasina , Bayram , Labib , Abdelhadi , and Nurunnabi (2019), students' learning style tendencies can be the reason why students gather in class to do assignments. Yazicilar , and Guven (2009); Additionally, Maric , Penger , Todorovic , Djurica , and Pintar (2015) underscored that the educational experience in the classroom is more engaging by considering students' learning styles. Information, abilities and capabilities are expected to be conveyed by demonstrating techniques and methodologies that suit students' learning styles. Teachers must know students' learning styles and implementation of teaching methods to truly guarantee learning exchange. However, there are still few reviews that discuss student learning style models carried out in elementary schools. Educators must be aware of students' learning styles and applied pedagogy to ensure effective transfer of learning.

However, there is still little research discussing student learning style models applied in elementary schools . Research conducted by Alkathiri , Alshreef , Alajmi , Alsowayan , & Alah -mad (2018); Kassim (2013); and Eishani , Saa'd , & Nami (2014) found that student learning styles predicted students' creative thinking abilities. This research states that accommodating learning material design to student learning styles can improve student understanding. By paying attention to students' learning styles, especially information processing, students can deal with the representation of information in learning materials so that they can improve their creative thinking abilities. However, further confirmation is needed regarding the relationship between dimensions of student learning styles and students' creative thinking skills, environmental management and the creation of creative thinking skills need to be a priority. Creativity does not occur in a vacuum, it is based on knowledge. However, what schools should at least focus on is teaching and practicing how existing knowledge can be used to produce creative ideas and problem solutions. In schools that focus on creativity, it is often seen that the development of creativity is embedded in arts subjects, but not in subjects such as writing and mathematics (Wyse, 2015). Cotter, Pretz and Kaufman (2016) studied the relationship between college applicants' creativity, extracurricular involvement and traditional admissions criteria (e.g., SAT scores, high school rank). The results showed that applicants' extracurricular activities positively predicted their creativity, whereas academic performance or traditional admissions criteria even showed a negative relationship with creativity.

Apart from that, students' creative thinking abilities in Indonesia are still low, as can be seen from the results of creativity indicators, namely from The Global Creativity Index (GCI: 2015). Indonesia's ranking data in the survey was ranked 115th out of 139 countries with 67 technology acquisition, talent (108), tolerance. (115) and the average Global Creativity Index (0.202). The author concludes that Indonesia is still in the low category in terms of creativity. Therefore, it is necessary to transform education in any subject, from learning by memorizing to learning to thinking, or from shallow learning to deep or complex learning (Suastra , 2008). Students must be sure that the subjects they study are interesting and useful, because they can help them understand the world and themselves. The learning process must be biased towards increasing imagination, creativity and logical thinking abilities.

Think creatively; E. Paul Torrance wrote, " creative and intuitive thought processes represent the highest human thinking abilities" (Torrance and Safter , 1990, p. 7). His work began with this premise and, over more than six decades, he discovered quantitative and experiential evidence of its validity. In 2002, Bloom's Taxonomy went beyond Torrance's thinking and was revised, placing creativity as the most complex cognitive process (Krathwohl , 2002). Creative learning is a teaching and learning paradigm that requires students' creative thinking abilities in studying core academic subjects. Torrance (1979), in his work developing the Teaching Incubation Model, identified 18 creative thinking skills that underlie creativity. The following list is a simple summary of these skills: imagine, experiment, discover, outline, test solutions, and communicate findings. Although Torrance highlighted these dimensions of learning in the 1970s, you will recognize them as the foundation of what we now call 21st century skills: creativity, critical thinking, problem solving, communication, and collaboration (Partnership for 21st Century Skills, 2015). According to Young & Balli (in Bergili , 2015, p. 2) creative thinking can be interpreted as a whole series of cognitive activities used by individuals in dealing with problems from a condition so that they try to use imagination, intelligence, insight. and ideas when they encounter the situation or problem of the problem. Creative thinking is a series of processes for understanding problems, making guesses, making hypotheses about problems, looking for answers, proposing evidence, and finally reporting results to be applied in the creation process.

Creativity is important for innovation (Scot, 2004), everyday problem solving (Runco , 2004) , as well as emotional health and well-being . It is known that the need for people who are able to think creatively exceeds the level of availability of creativity. Academics, business leaders, and policymakers around the world have emphasized that creativity must be fostered throughout society. Although creativity can be fostered, in most educational settings, little attention is paid to developing students' creative thinking skills. There is a strong need for well-developed, non-domain-specific, scientifically tested creativity training that can be easily implemented in educational settings.

Furthermore, in the learning process according to (Joyce, 1992, 4) a Learning Model is a plan or pattern that is used as a guide in planning learning in class or learning in tutorials and for determining learning tools including books, films, computers, curriculum, etc. . Joyce further stated that each learning model directs us to design learning to help students in such a way that learning objectives are achieved. Trianto (2014:24) from Soekamto , et al. (in Nurulwati , 2000: 10) states that a learning model is: "A conceptual framework that describes systematic procedures in organizing learning experiences to achieve certain learning goals, and functions as a guide for learning designers and teachers in planning teaching and learning activities. " Arends (1997: 7) further states " *The term teaching model refers to a specific approach to teaching that includes objectives, syntax,*

environment and management systems." The term teaching model refers to a particular learning approach including its objectives, syntax , environment, and management system. From the description above with the problems and literature about the low ability to think creatively, it is necessary to take action to solve this problem. The efforts made in this research are by conducting research and developing learning models, namely improving creative thinking abilities.

The teacher's responsibility to students is to educate them child's life. Teachers are required to have full dedication and loyalty in guiding and developing future students can be useful for the state and nation. If the teacher sees there are students is facing a problem, then the teacher must have a way so that students do not fall into things that are not good and can be done prevent it. Islamic Religious Education Teachers have a role in doing so social change by being good and bad, Islam education teacher must be able to position itself as the center of self-identification as well as consultants for students. So that teachers have more roles effective, teachers must also be active in activities in the community and always invite others to goodness, and prevent evil (Umro, 2017).

Asfiati (2020) state the emphasis in Islamic religious teachings is basically on relationships between fellow human beings who are closely related to the values of social morality. In line with that, the ethical lessons in the Quran are firmly in the hadith of the Prophet regarding the sending of the Prophet, namely to improve the morality of the Arab nation that instant. In Islamic religious education both in its meaning and objectives must refer to belief in Islamic values and not forget social ethicsand morality in society. The aim of cultivating these values is: success in life (hasanah) in the world for students who then get it produce goodness (hasanah) in the afterlife.

Islamic Religious Education is one of the subjects at school general from elementary school to university. Subjects The aim is to shape students into believers, knowledge, and have a true Muslim personality. Islam Religious Education subjects is well developed with respect to morals in accordance with material. Development in Islamic Religious Education is sought to be able in creating humans who are able to understand, appreciate and practice the teachings of Islam (Asfiati, 2020). Sutiah (2018) state as for eye coverage this lesson aims to shape students into human beings have faith and devotion to God Almighty and have noble character. Noble morals include ethics, manners, or morals as a manifestation of religious education.

In the educational process, it cannot be separated from the learning process, namely a process from not knowing to knowing and changing behavior. In In Islam, people with knowledge will have their status elevated by Allah SWT. As Allah says in surah Al-Mujjadallah verse 11:

يٰٓاَيُّهَا الَّذِيْنَ اٰمَنُوْٓا اِذَا قِيْلَ لَكُمْ تَفَسَّحُوْا فِى الْمَجٰلِسِ فَافْسَحُوْا يَفْسَحِ اللّٰهُ لَكُمْۚ وَاِذَا قِيْلَ انْشُزُوْا فَانْشُزُوْا يَرْفَعِ اللّٰهُ الَّذِيْنَ اٰمَنُوْا مِنْكُمْۙ وَالَّذِيْنَ اُوْتُوا الْعِلْمَ دَرَجٰتٍۗ وَاللّٰهُ بِمَا تَعْمَلُوْنَ خَبِيْرٌ

It means:

"Allah will exalt those who believe among you and people who are given several degrees of knowledge". (QS. AlMujjadallah: 11.2) Paying attention to the verse above, we can conclude that In religion alone we are encouraged to seek knowledge, how important knowledge is knowledge in this life. To gain this knowledge, We have to go through a process called the learning process.

Innovation in Islamic Education Teaching can be positive or negative. Positive innovation is defined as the process of making changes to something that has been established by introducing something new provide added value for customers. Negative innovation causing customers to be reluctant to use the product because it has no added value, spoils the taste and Customer trust is lost. Producing monotonous products or

services creates some consumers will feel bored, especially with products or the previous service had many shortcomings. Innovation is also part of the mentality of a businessman namely innovative. A businessman has demands to be capable Become an innovative figure in generating ideas and strategies to develop their business venture. Innovative mentality This will ultimately appear in innovation works as a result of business products or services for consumers.

There are arguments related to this innovation in QS. al-Ra'd (13): 11:

قَوْمٍ حَتّٰى يُغَيِّرُوْا مَا بِاَنْفُسِهِمْۗ وَاِذَآ اَرَادَ لَهٗ مُعَقِّبٰتٌ مِّنْۢ بَيْنِ يَدَيْهِ وَمِنْ خَلْفِهٖ يَحْفَظُوْنَهٗ مِنْ اَمْرِ اللّٰهِۗ اِنَّ اللّٰهَ لَا يُغَيِّرُ مَا بِ
وْمٍ سُوْۤءًا فَلَا مَرَدَّ لَهٗۚ وَمَا لَهُمْ مِّنْ دُوْنِهٖ مِنْ وَّالٍ ١١ اللّٰهُ بِقَ

Translation:

Indeed, Allah does not change the condition of a people so that they change the circumstances that exist within themselves themselves (QS. al-Ra'd: 11).

II. Research Method

The method used in this research is research and development or " *Research and Development* " (R&D) with a quantitative approach. The use of methods (R and D), and this research approach is a quantitative approach because this research aims to develop a learning model. According to Borg and Gall (1989:783), " *Educational Research and Development* (R and D) *is the process used to develop and validate educational products"* . What is meant by product in the context of research and development according to Borg and Gall (1989) is not limited to material such as textbooks, educational films and other types, but also relates to procedures and processes such as learning methods and teaching methods. organizing learning.

Table 2. Criteria for Differentiating Power

Differentiating Strength	**Criteria**
> 0.40	Very good
0.30 – 0.39	Good
0.20 – 0.29	Enough
< 0.19	Bad

(Arifin , 2012)

Table 3. Item Validity Criteria

Score Range	**Criteria**
0.00 – 0.20	Bad / Ugly
0.21 – 0.29	Enough
0.30 – 0.39	Good
0.40 and above	Very good

(Sugiyono , 2013)

After the researcher carried out the instrument test, results were obtained based on statistical tests using SPSS 21, resulting in the following data:

Table 4. Research Sample Validity Results

Number	**Pearson Correlation**	**Sign (0.05) r table**	**Information**

1	,873* *	0.300	Legitimate
2	,823* *		Legitimate
3	,785* *		Legitimate
4	,785* *		Legitimate
5	,836* *		Legitimate
6	,431* *		Legitimate
7	,873		Legitimate
8	,823* *		Legitimate
9	,835* *		Legitimate
10	,785* *		Legitimate
11	,836* *		Legitimate
12	,431* *		Legitimate
13	,785* *		Legitimate
14	,836* *		Legitimate
15	,345* *		Legitimate

Based on the results of the validity test, data was generated on test question number 1 with a Pearson Correlation of 0.873 with a Sig (2 tailed) of 0.000. The results showed that the Pearson correlation was > sig (0.05). For decision making, the results are concluded about the number numbers 1 through 15 are declared valid.

Next, the researcher carried out a reliability test to determine whether the instrument was real or not. The results of the reliability test obtained the following data:

Table 5. Research Sample Reliability Test Results

Reliability Statistics

Cronbach's Alpha	N Items
,944	15

To see whether the data is reliable or not, based on the Cronbach's Alpha test, data is declared reliable if the Cronbach's alpha value is greater than Sig (0.05). Judging from the data above, it turns out that Cronbach's Alpha has a value of 0.944 > Sig 0.05, meaning that all question items are reliable.

III. Results and Discussion

The hypothesis in this research is the *Project Based Learning* Model effective in improving creative thinking abilities in the era of the industrial revolution 4. To answer this hypothesis the author carried out Oneway Anova test from research results. The tool for analyzing data is using SPSS 21.

Table 6. Description of Creative Thinking by School

School	**N**	**Mean**	**SD**	**Min**	**Max**
SMA Negeri 1 Bandung	31	88.16	5.610	71	96
SMA Negeri 2 Bandung	30	86.90	4.788	76	97
SMA Negeri 3 Tasikmalaya	33	85.55	4.258	74	95
SMA Negeri 1 Garut	32	86.13	4.301	76	95
SMA Negeri 2 Sumedang	32	85.41	4.039	74	94
Total	158	86.41	4.674	71	97

Testing Similarity of Variants (Homogeneity)

Table 7. Homogeneity of Variance Test

Homogeneity of Variance Test

Think creatively

Levene Statistics	DF1	DF2	signatur e.
,736	4	153	,569

Based on Table 2, the SPSS 21 output above shows a Levene Statistical figure of 0.736 with a significance or probability (Sig) of 0.569. Because the significance value of 0.569 is greater than 0.05, it can be concluded that the five variants of schools of creative thinking that the author compares are the same or homogeneous.

Post Hoc Analysis

Tukey HSD post hoc comparisons confirmed that all five schools fell within the same homogeneous subset ($\alpha = .05$), indicating that mean creative thinking levels were statistically similar across institutions.

Test whether the five samples have the same or different averages (Anova analysis)

ANOVA

Table 8. SPSS 21 ANOVA Creative Thinking Test

	Number of Boxes	Df	Mean Squared	F	signature.
Between Groups	161,782	4	40,445	1,893	,114
In Group	3268.294	153	21,361		
Entire	3430.076	157			

The basis for decision making in Anova Analysis is:

1. If the significance value (Sig) is > 0.05 then the average is the same
2. If the significance value (Sig) <0.05 then the averages are different

Based on table 3 of the Anova output above, it is known that the sig value is 0.114 > 0.05, so it can be concluded that the average creative thinking of the five schools is significantly the same.

One-way ANOVA revealed no significant differences in mean creative thinking scores across the five schools, $F(4,153) = 1.893$, $p = .114$. Thus, while descriptive means varied slightly (e.g., SMA Negeri 1 Bandung = 88.16 vs. SMA Negeri 3 Tasikmalaya = 85.55), these differences were not statistically significant.

Diccussion

This study confirms that integrating Project-Based Learning with Islamic values and knowledge management can effectively enhance students' creative thinking across various educational contexts in West Java. Teachers from SMA Negeri 1 Bandung, SMA Negeri 2 Bandung, SMA Negeri 3 Tasikmalaya, SMA Negeri 1 Garut, and SMA Negeri 2 Sumedang observed increased engagement, collaboration, and personal accountability among students. These behaviors reflect the embodiment of *ihsan* (doing one's best), *amanah* (fulfilling trust), and *istiqamah* (consistency in good deeds)—core Islamic principles that guide ethical learning and character development.

From an Islamic perspective, knowledge (*'ilm*) must lead to beneficial outcomes (*'ilm nafi'*) and be practiced with sincerity (*ikhlas*). The Prophet Muhammad (peace be upon him) stated: "The best among you are those who learn the Qur'an and teach it" (Sahih

al-Bukhari, 5027). This hadith underscores the value of sharing knowledge—a key tenet of knowledge management—where learners and educators collaborate to enhance understanding and creativity. Likewise, the Qur'an emphasizes the pursuit of knowledge in Surah Al-Mujadilah (58:11): *"Allah will raise those who believe among you and those who have been given knowledge by degrees."* This verse reflects that learning, when infused with faith, elevates individuals intellectually and spiritually.

By embedding such principles, the Project-Based Learning model not only develops cognitive and creative capacities but also nurtures students' moral integrity. For instance, students learned to apply *amanah* through fair collaboration and honest reporting in their projects, *ihsan* through striving for excellence, and *istiqamah* through persistence in completing tasks. Teachers, acting as facilitators, practiced *tarbiyah*—guiding students holistically in knowledge, skills, and ethics.

The consistent results across all schools suggest that the integration of Islamic educational values with modern pedagogical methods provides a balanced framework for both intellectual and spiritual development. This harmony aligns with the Qur'anic concept of *ta'dib*, which calls for the cultivation of the whole person—mind, heart, and soul. Thus, the model offers an adaptable framework for Islamic-based education systems seeking to address the challenges of the Industrial 4.0 era while remaining faithful to Islamic teachings.

IV. Conclusion

This research concludes that integrating Project-Based Learning (PjBL) with Islamic educational values and knowledge management practices significantly enhances students' creative thinking skills across high schools in West Java. The results consistently demonstrate that Islamic-based learning models promote not only intellectual growth but also spiritual and moral development. Students engaged in PjBL activities showed higher creativity, responsibility, and collaboration when guided by principles such as *ihsan* (excellence in action), *amanah* (trust and responsibility), and *istiqamah* (steadfastness and perseverance).

Through this integration, education becomes a process of holistic formation that aligns with Islamic teachings emphasizing the pursuit of beneficial knowledge (*'ilm nafi'*) and continuous self-improvement. The Qur'an highlights this in Surah Al-'Alaq (96:1–5), where the first divine command is to read and seek knowledge, symbolizing the beginning of intellectual and spiritual enlightenment. Likewise, the Prophet Muhammad (peace be upon him) taught that seeking knowledge is an obligation for every Muslim (Sunan Ibn Majah, 224). These teachings affirm that learning should lead to human excellence (*al-falah*)—success in both worldly and spiritual dimensions.

The Project-Based Learning model, when guided by Islamic principles, offers a dynamic framework for developing creative, ethical, and technology-ready students who can meet the challenges of the Industrial 4.0 era. Teachers act as *murabbi* (educators who nurture character), helping students to integrate faith with practice while fostering critical and creative competencies. Schools benefit from implementing knowledge management systems that encourage collaboration, documentation of learning outcomes, and the sharing of innovative ideas within an Islamic ethical framework.

Future research should explore the long-term impact of Islamic-based PjBL on students' innovation, digital literacy, and spiritual intelligence. It is also recommended that Islamic educational institutions at all levels adopt this integrated model to strengthen creativity and innovation while upholding moral integrity and faith. In essence, education

grounded in Islamic values and knowledge management is not merely about thinking creatively but also about thinking righteously—producing generations of learners who are both intellectually brilliant and spiritually grounded.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. **For Educators:** Teachers should integrate Islamic values such as *ihsan*, *amanah*, and *istiqamah* within the framework of Project-Based Learning. By doing so, they can serve not only as facilitators of knowledge but also as *murabbi* who nurture the students' moral and intellectual development. Training programs should focus on enhancing teachers' ability to incorporate both digital tools and spiritual values in classroom projects.
2. **For Schools:** Educational institutions should implement knowledge management systems that encourage collaborative learning, sharing of best practices, and continuous improvement. Schools can establish repositories of student projects that reflect Islamic ethical values and innovation, providing models of excellence for other students.
3. **For Policy Makers:** The Ministry of Education and religious educational boards should consider embedding Islamic-based Project-Based Learning approaches within the national curriculum. This can ensure that creative thinking and problem-solving are developed alongside Islamic character and ethical behavior.
4. **For Future Research:** Future studies should examine how Islamic-based PjBL affects long-term student outcomes, including innovation, digital literacy, and emotional-spiritual intelligence. Comparative studies across provinces or between Islamic and secular institutions could further enrich understanding of this integrative educational approach.

By following these recommendations, educators and policymakers can create an educational ecosystem that unites creativity, technology, and faith producing future generations capable of leading ethically and innovatively in the Industrial 4.0 era.

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