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Trends in Project Based Learning Models in Increase 6C Skills (Character, Citizenship, Critical Thinking, Creative, Collaborative, and Communication)

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Abstract

21st century skills, often referred to as 6C, are not only learning objectives but also the foundation for creating individuals who can compete globally. In response to these needs, various innovative learning approaches have begun to be applied in the education system. One of them is Project Based Learning (PjBL). Based on these reasons, this study aims to analyze the trend of project based learning models in improving 6C skills. This study uses the Systematic Literature Review (SLR) method with the PRISMA method. Data collection was carried out by analyzing 500 related articles found on Google Scholar. After the selection process is complete, the data collected will be presented in narrative form. The results of this study underline that Project-Based Learning (PjBL) is an effective learning method to support skill development, both in academic and non-academic aspects. Although there are a number of challenges in its implementation, the advantages of PjBL in encouraging motivation, increasing engagement, and shaping student character make it a feasible approach to be implemented widely at various levels of education. The implication of this finding is the need for integration of PjBL into the education curriculum with adequate training support for educators so that this method can be applied optimally and have a positive impact on the quality of learning.

Keywords: Project Based Learning, 6C Skills, 21st Century

INTRODUCTION

Revolution industry 4.0 and society 5.0 have change need skills in the world of education, emphasizing importance development competence 21st century, which includes character, citizenship, thinking critical, creativity, collaboration, and communication (6C) (Lase, 2019; Zubaidah, 2018) . Revolution industry 4.0 is marked with development rapid digital technology, such as intelligence artificial intelligence, Internet of Things (IoT), and *big data*, which integrate technology to in various aspect life (Quy et al., 2023; Rohida, 2018) . Temporary that, society 5.0 focuses on the utilization of technology For create a human - centered, capable society balancing progress economy with settlement problem social. In the context of this, system education sued For prepare generation young to have adaptive, innovative and solution - oriented skills (Rajendran & Shah, 2020; Subandowo, 2022) .

Skills 21st century, which is often referred to as 6C, no only become objective learning, but also becoming runway For create individuals who can compete at the global level. Character and citizenship become component important For build individuals who have integrity, empathy, and sense of responsibility answer to his community (Dewi et al., 2021; Dharma & Siregar, 2015) . Thinking critical and creativity is skills essential For face challenge complex in the digital era, where innovation become key main in create effective solution (Hardiyana, 2016; Melina, 2022) . In addition, collaboration and communication is the ability that allows individual For Work in a way synergistic in team cross discipline, good in a way direct and also via digital platforms (Abdul Latip, 2020; Jufriadi et al., 2022) .

In context modern education, 6C skills become essential elements For equip participant educate to be able face global challenges. Character and citizenship, for example, become base For create responsible individual responsible and able contribute in a way positive in the community they (Fikri et al., 2020; Shah & Kamaruddin, 2022) . Temporary that, think critical and creative is skills main For solve complex problem, meanwhile collaboration and communication ensure participant educate

capable Work in team cross discipline with effective. As one of the learning models based on project real, PBL allows participant educate For to practice 6C skills in supportive environment exploration, innovation, and reflection. Various study previously show effectiveness PjBL in increase skills think critical, collaboration, and creativity student (Inganah et al., 2023; Karim et al., 2020) . However, challenges in There are also many implementations of this model reported, such as teacher readiness, limitations source power, and need will be a comprehensive evaluation strategy.

As response to need said, various approach learning innovative start applied in system education. One of the approach that gets attention wide is a Project Based Learning (PjBL) model. PjBL give experience participant - centered learning educate, where they are involved in a way active in relevant projects with the real world (Monica et al., 2019; Ningtyas & Jati, 2018). This model No only focused on results end learning, such as product or presentation, but also in the development process supporting skills success individuals in the environment work and global society. Through PjBL, participants educate invited For dig problem in a way deep, designing solution creative, and collaborative with colleagues them, so that create experience meaningful learning (Rahmawati et al., 2021; Widyaningtyas, 2022) .

In its implementation, PjBL allow integration 6C skills in general holistic. Projects designed with Good give opportunity for participant educate For hone ability think critical in analyze problem, at the same time develop creativity in formulate solution (Admawati & Jumadi, 2021; Bakri et al., 2023). Work process team in PjBL also strengthens ability collaboration and communication, while reflection that is done throughout the project process help formation character and understanding about citizenship. With approach this, PjBL become one of the appropriate learning strategies For answer demands revolution industry 4.0 and society 5.0, at the same time prepare participant educate For facing a dynamic and full future challenge (Admawati & Jumadi, 2021; Ningsih et al., 2020) .

Approach *systematic literature review* (SLR) is used in article This For analyze trend implementation PjBL in development 6C skills. SLR is systematic and transparent method For identify, evaluate, and synthesize results relevant research. Research This aiming For analyze trends in project based learning models in increase 6C skills. Through analysis this, it is expected can obtained understanding deep about effectiveness, challenges, and opportunity development PjBL in context education 21st century. This article will discuss PBL model trends in increase 6C skills with focus on three aspect Main : (1) the effectiveness of the PBL model in develop each of the 6C skills, (2) challenges faced in implementation of this model, and (3) strengthening strategies For support PBL success in various context education. With Thus, research This expected can give contribution for development policies and practices more education effective in this era of global transformation .

METHOD

Study This use Systematic Literature Review (SLR) method with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) method. This matter aiming For analyze and summarize relevant literature about Topic regarding the Project Based Learning Model in Increase 6C Skills (Character, Citizenship, Thinking) Critical, Creative, Collaborative, and Communication). SLR is systematic and structured method For identify, assess quality, and synthesize findings from various existing studies, with objective give a comprehensive overview about condition existing research (Motta & Galina, 2023) . In the context of study Here, PRISMA is used as guidelines For ensure that the review process is carried out with high transparency and clarity, as well as For reduce bias in data selection and synthesis. PRISMA includes identification studies through database search, filtering article based on criteria inclusion and exclusion that have determined, assessment quality methodological relevant studies, as well as data retrieval and synthesis for produce the conclusion that can be drawn trusted (Liberati et al., 2009; Page et al., 2021) . With use approach this, research This aiming For produce valid and acceptable conclusions reliable about the topic being researched, namely the project based learning model in increase 6C skills (character, citizenship, thinking) critical, creative, collaborative, and communication). The flow study with use The Prism method is presented in Figure 1 .

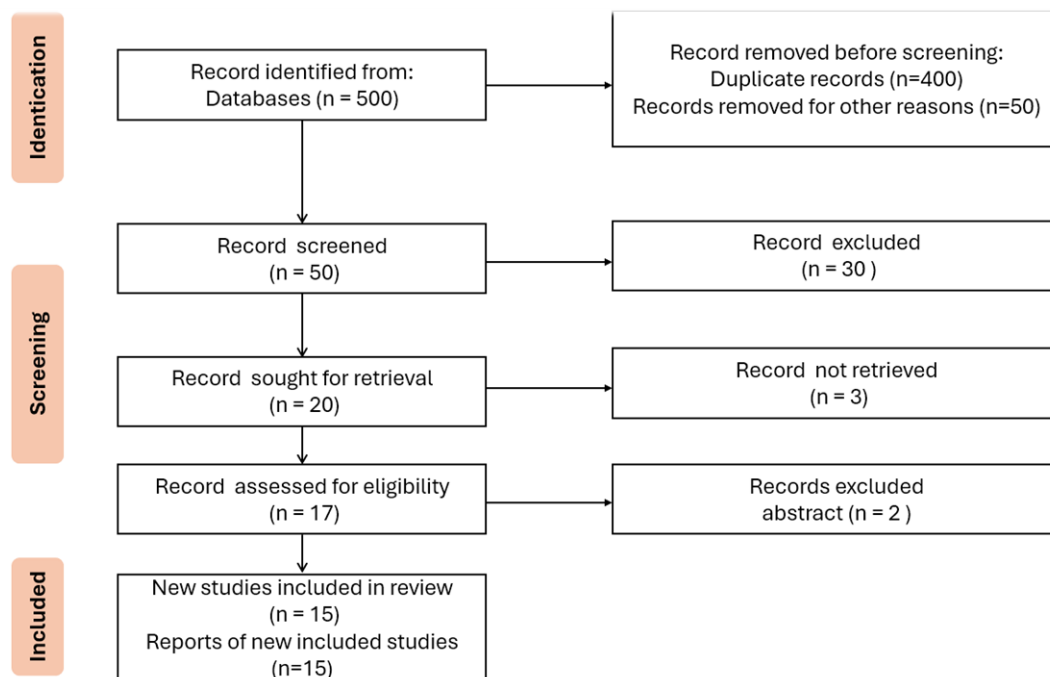


Figure 1. Research Flow with Using the Prism Method

Systematic Literature Review (SLR) analysis with method prisms used in research This is as following : 1.) Determination criteria eligibility, in step This required procedure preparation of a mature literature review. Currently researcher has find Topic study namely the Project Based Learning Model in Increase 6C Skills (Character, Citizenship, Thinking) Critical, Creative, Collaborative, and Communication). Research This use criteria namely 1). Search article 2018 to 2024 are sought after through *google scholar*, with the title word 6C skills and keywords learning *Project Based Learning* (PjBL). 2). Determination source information. This step started with search for items that meet requirements at the stage planning. Mandatory requirements that is indexed articles journal syntax 1-5. 3). Selection literature, criteria publication journal four year last related with a deep project based learning model increase 6C skills (character, citizenship, thinking) critical, creative, collaborative, and communication) are from 2020 to with 2024 based on sources *Google scholar* .

Then to be continued with data collection, when This at least There are 500 articles in *Google Scholar*. Therefore that, the criteria are available For enter and with exclude article from population, a total of 50 articles met the criteria criteria election library. For evaluate how much Good Topic article in accordance with objective research, a total of 50 articles were found during stage data collection later chosen with read fast all over text article. In the steps next, every part article must associated with objective study For determine articles that meet requirements. On the other hand, title, abstract, methods, and conclusion study No in accordance with objective study will be eliminated. After the selection process finished, the data is collected will served in form narrative. After 15 articles considered appropriate and correct with using Path analysis, researchers review and analyze it For fulfil objective study .

RESULTS AND DISCUSSION

Results

One of the innovative and student - centered learning models that is Project Based Learning Learning Model. The Project Based Learning learning model is very important Because give chance For develop various relevant skills. Students No only Study theory, but also application the knowledge they have get in real world context with solve real problems. PjBL push development skills think critical, collaboration, and communication, so that student must Work in team, discuss, and present results project They. This model also connects learning with life real, improve motivation and engagement students, as well as allow they For see relevance from what they learn. The use of the PjBL model is very important For increase 6C skills of students, preparing they For future challenges. Analysis results found 15 articles from *Google scholar* that meets criteria eligibility in accordance with objective study This. The results of the analysis article presented in Table 1.

Table 1. Project Based Learning Model in Improving 6C Skills (Character, Citizenship, Critical Thinking, Creativity, Collaboration, and Communication).

Name	Title	Results
(Kurniallah et al., 2024)	Learning model Based on Project in Economics Subject: Evaluation To Skills Think Critical High School Students	learning model based on project can increase skills think critical students, although There is a number of obstacles that need to be overcome overcome for example like level more experience low, level difficulties and challenges more students height, and level greater understanding and effectiveness low. Although so, the model Still own impact positive to learning and improvement skills student .
(Khusumawati & Saino, 2020)	Influence Alfamart Module Based Project Based Learning On Learning Outcomes With Mediation Variables Competence Student State Vocational School 2 Buduran Sidoarjo	Project based learning model based on learning module Alfamart influential to competence student with value 1.128, 2) competence student affect the results Study with value 5.263, 3) The project based learning model is influential to results Study with value 2.968, and 4) competence student No can mediate the influence of the project based learning model module Alfamart to results Study student with mark sobel test $0.281 > 0.05$.
(Setiawati et al., 2024)	The Influence of Project Based Learning Models and Interest in Learning Regarding Islamic Religious Education Learning Outcomes	Research result This show that positive and significant relationship between the project based learning learning model and results learn Islamic Religious Education for students with number correlation of 0.443 and the coefficient the determinant of 0.196. A positive and significant relationship between interest Study with results learn Islamic Religious Education for students with number correlation of 0.590 and the coefficient the determinant of 0.196. Contribution relatively from model variables project based learning towards results Study by 35.3% and the relative contribution of the variable interest Study to results Study by 64%.
(RRN Sari & Saino, 2024)	Influence Implementation Learning Based on Project to Motivation Study through Locus of Control as Intervening Variables	Research result that is implementation learning based on project (X) no influential to motivation learning (Y), variable implementation learning based on project (X) has an impact significant on locus of control (Z), the locus of control variable (Z) has an effect significant to motivation learning (Y), and variables implementation learning based on project (X) has an impact significant to motivation learning (Y) through locus of control (Z) as intervening variables .
(Gustin et al., 2018)	Integrated problem-based learning versus lectures: a path analysis modeling of	Research result show that in curriculum based on lecture integrated The same its effectiveness with PBL curriculum in

Name	Title	Results
	the relationship between educational context and learning approaches	promote approach learning deep students, strengthening importance integrate curriculum before choose the teaching format .
(Aini & Sari, 2020)	The Effect of Project-Based Learning on Students' Critical Thinking and Creativity: A Path Analysis Approach. Journal of Education and Learning (EduLearn)	significant relationship between involvement student in projects and improvements skills think critical and creative they .
(Nurhasanah & Mulyasa, 2020)	The Impact of Project-Based Learning on Students' Motivation and Learning Achievement: A Path Analysis Approach	Research result show that implementation of PBL can increase motivation student in a way significant. In the analyzed model, PBL gave impact positive direct to motivation students, which in turn also influences the results Study they .
(Jafari & Sadeghi, 2021)	Project-Based Learning and Students' Performance in Higher Education: A Path Analysis Approach	The implementation of PBL shows influence positive direct to performance academic students. This is indicates that when student involved in project based on learning, they tend show performance more academic Good. Apart from the influence direct, research this also found existence influence No direct from PBL to performance student through improvement motivation and engagement They. This means that even though PBL has impact direct to performance, change in motivation and engagement play role that is not lost important
(Zhao & Zhang, 2020)	The impact of Project-Based Learning on students' communication skills: A path analysis approach	Research result show that PBL is significant increase skills students' verbal and non-verbal communication, which then contribute to the improvement results academic they. The path analysis model reveals that involvement student in project based on learning play a role as a mediator between PBL and improvement skills communication, as well as performance academic student .
(Feng & Huang, 2019)	The influence of Project-Based Learning on students' character development: A case study in higher education	PBL no only increase skills academic students, but also play a role in develop values character like Work same, leadership, responsibility responsibility, and ethics. PBL provides chance for student For face challenge real, collaborate with Friend class, and solve problem in a way together, which strengthens formation character they in context education tall .
(Wahyuni & Fatimah, 2022)	Enhancing Collaborative Learning through Project-Based Learning: A Path Analysis of Student Engagement and	PBL has influence No direct to achievement academic through involvement students. This means that PBL improves involvement students, who then contribute to the improvement

Name	Title	Results
(Wulandari & Gunawan, 2023)	Achievement The Effect of Project-Based Learning on Critical Thinking Skills in Science Education: A Path Analysis Study	achievement academic . The implementation of PBL has influence No direct to achievement Study through improvement skills think critical. This is show that even though PBL plays a role direct in increase results Study students, skills think critical also plays role important in reach results the .
(We are & Marwanti, 2023)	The Role of Project-Based Learning in Enhancing Student Motivation and Achievement: A Path Analysis Approach	Analysis results show that PBL has influence No direct to achievement academic student through improvement motivation them. More motivation tall increase involvement and effort student in learning, which contributes to the improvement achievement academic .
(RA Sari & Ismail, 2021)	Path Analysis of Collaborative Learning and Project-Based Learning in Enhancing Students' Problem-Solving Skills	Study This identify that motivation student or involvement student can act as a mediator connecting CL and PBL with skills breakdown problem. Students who are more involved or more motivated in learning collaborative or based on project tend own skills breakdown more problems Good .
(Maharani & Nugraha, 2020)	Project-Based Learning and Its Effect on Student Engagement and Academic Achievement: A Path Analysis Approach	Involvement more students tall relate with achievement more academic good. Students who are more involved in learning tend own results more academic Good Because they more active in the learning process and more dedicated For reach objective academic they .

Various study show that learning model based on Project (Project-Based Learning/ PjBL) has impact significant to various aspect learning students, good in context education basic, intermediate, and high. In terms of In general, PBL has proven effective in increase skills 21st century like think critical, creativity, collaboration, communication, and development character student .

Study previously show that PBL can increase skills think critical high school students in the eyes lesson economy, although there is constraint like level experience and understanding which are more low (Kurniallah et al., 2024) . Other studies support this. findings This with show connection significant between involvement student in projects and improvements skills think critical as well as creativity they (Aini & Sari, 2020) . In the context of education science, research find that PBL has influence No direct to results Study through improvement skills think critical (Wulandari & Gunawan, 2023) .

Motivation students are also aspect important factors that are influenced by PBL. Research previously find PBL in significant increase motivation students, who in turn impact on the results Study they (Nurhasanah & Mulyasa, 2020) . Other research strengthens this. findings this, mentions that involvement more students tall relate with achievement more academic Good (Maharani & Nugraha, 2020) . Research other show that PBL improves involvement students, who then contribute to the achievement academic (Wahyuni & Fatimah, 2022) .

Besides skills academic, PBL also plays a role in development character students. Research previously disclose that PBL helps to form values like Work same, leadership, responsibility responsibility, and ethics through experience Study based on project (Feng & Huang, 2019) . Other studies highlight improvement skills verbal and non-verbal communication as results from involvement student in project based on learning, which ultimately also improves results academic (Zhao & Zhang, 2020) .

A number of studies highlight how PBL affects results Study student in a way direct and also No directly. Research previously show that PBL is based module own influence positive to competence and results Study vocational school students, although competence student No become a significant mediator (Khusumawati & Saino, 2020) . Meanwhile that, other studies reveal PBL contribution of

35.3% to results Study Islamic religious education (PAI) (Setiawati et al., 2024) .

In education high, other studies show that PBL has influence direct to performance academic students, with motivation and engagement as a mediator (Jafari & Sadeghi, 2021). Similar results found, mentioned that PBL and curriculum based on lecture integrated You're welcome effective in support approach learning deep (Gustin et al., 2018) . By overall, the findings This confirm that PBL is approach effective learning For increase skills academic and non- academic students, at the same time prepare they For face real- world challenges. However, the implementation of PBL requires attention to constraint like level experience students and support facilitator in the learning process .

Discussion

Findings various study show that implementation of Project- Based Learning (PjBL) consistent give impact positive to various aspect learning, including skills 21st century, motivation learning, involvement students, as well as results learning. Findings that show that PBL improves skills think critical, creativity, and communication indicates relevance method This with the needs of the world of education in the era of Industrial Revolution 4.0 and Society 5.0.

Findings from various study confirm that Project-Based Learning (PjBL) contributes in a way significant to development skills think critical thinking, creativity, communication, and collaboration. In addition, PBL also improves motivation and engagement student in learning, which is No direct influence achievement academic them. For example, the results study disclose that PjBL capable increase skills verbal and non-verbal communication (Hartono & Asiyah, 2018) , while there is study show PBL's contribution in formation character students, such as Work same, leadership, and responsibility answer (Ferdiani & Pranyata, 2022) . This is show that approach based on project give benefit multidimensional, good in aspect cognitive and also affective learning.

Support to effectiveness PjBL has Lots discussed in literature previously. For example, other studies have shown that PjBL give student chance For Study in a way independent through the process of solving problem complex (Karnoto, 2022) . This is in line with findings that state that motivation and engagement is an important mediator in connection between PBL and performance academic student (Purnamawati & Kustiawan, 2018) . In addition, PjBL push student For involved in learning active and based experience, which is very relevant with results study about involvement more students tall in learning based on project (Treasures, 2022) .

Findings This own implications important in context modern education, especially in prepare student For face challenges in the era of Industrial Revolution 4.0 and Society 5.0. PBL can adopted in a way wide For increase skills 21st century, such as think critical, communication, and collaboration, which are essential in the world of work. In addition, the results This also confirms importance teacher training for ensure success implementation of PBL, considering complexity approach This in practice.

Although PBL has been proven effective, some study take notes existence constraint in its implementation. For example, Kurniallah et al. (2024) reported that student with level experience low face difficulty in manage project, and Wahyuni & Fatimah (2022) showed that The effectiveness of PBL often depends on the level of involvement students. Limitations other is lack of generalization results research, because part big studies done in context certain, such as education tall or level school certain, which may be No fully applies in all educational settings.

CONCLUSION

Findings This confirm that PjBL is approach effective learning For support development skills academic and non- academic. Although there is a number of challenge in its implementation, the advantages of PBL in increase motivation, engagement and development character student make it relevant choices For applied in a way wide in various level education .

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