Project-Based Learning Model Towards Students' P21 Skills in the 21st Century:
In a Systematic Literature Review

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ABSTRACT

The existence of prospective teacher education programs in a number of higher education institutions is very essential to prepare future teacher candidates. Prospective teacher education programs are expected to provide opportunities and challenges for prospective teacher students to face various uncertainties in the future. This phenomenon in its turn leaves a big task for a number of prospective teacher education programs to produce future teacher candidates who have super skills (4Cs skills) in order to meet the 21st century educational needs. Prospective teachers in the 21st century are experts at solving problems that occur and have pedagogical skills that support the achievement of educational goals in the 21st century. The 21st century education requires teachers who are able to integrate their 4Cs skills into meaningful learning, thus to produce graduates who have 4Cs skills as well. Therefore, integrating 4Cs skills into education for prospective teacher students can enable them to be future teachers who have appropriate skills needed to become successful teachers in the 21st century. A number of prospective teacher education programs at higher education institutions seek to make changes to their education system and curriculum to change traditional teaching skill practices to suit the learning needs of the 21st century. Various learning models are designed in such a way as to support the achievement of the 21st century learning goals. One of the models that is deemed suitable is the Project-Based Learning (PBL) model. Project-based learning is believed to be a medium for prospective teacher students to interact, discuss, and internalize the knowledge they have in applying existing theories to solve problems. Students' knowledge, attitude and skills are no longer just the results of the transfer of knowledge from lecturers to students, but it is more than that.

Keywords: 4Cs Skills, Project-Based Learning, Economics Education, Teacher Education, Learning.

1. INTRODUCTION

The world is integrated into a communication unit in the era of globalization assisted by information technology in the forms of internet and digital technology. Even though it is bothered by distance and pandemics such as Avian Influenza, Sars, Mers and Covid-19, interactions among areas, countries, regions, groups, and person to person can still be done via telephones, social media, webs, and Zoom meetings. If this situation is associated with learning, then distance learning is a solution to this situation (1) - (4).

Various learning strategies can be carried out to maintain the effectiveness of learning during these pandemics, one of which is project-based learning model. Project-Based Learning (PBL) is one of the learning that has advantages in improving college students' academic skills in terms of the abilities to collaborate and solve problems, and developing their creativity and thinking skills (5). PBL is a solution to improve graduates' abilities in terms of communication, collaboration, problem solving, and readiness to enter the world of work (6).

Likewise, the learning model for prospective economics teachers also requires appropriate adoption, adaptation and learning strategies, and one of the innovations that can be carried out is project-based learning model (PBL). The learning that encourages prospective teachers to collaborate and solve problems and is project-based becomes a suitable model to be developed for future teacher candidates (7). Project-based learning has also been implemented in various universities. For the education of prospective teachers, the PBL method is able to give meaning to increasing prospective teachers' motivation to develop their skills, be fun, and provide college students' sense of satisfaction in achieving the expected learning outcomes, and PBL can be a valid model applied in prospective teachers'

learning (8). Several articles have discussed how adopting project-based learning gives meaning to improving prospective teachers' skills (9).

Teachers' skills continue to develop along with the development of technology and scientific world. Initially teachers had 9 basic skills, then they developed into the digital technology and IT (information technology) based pedagogical skills (10). Along with the times, the skills of teachers in the 21st century have also changed. Teachers are required to have 4Cs skills (communication skills, collaboration skills, critical thinking skills, and creativity skills) (11). Super skills in the 21st century are soft skills that become provisions for prospective teachers to develop their students' potential in the future. (12).

A curriculum innovation is needed, including in the field of economics for prospective teachers. Economics curriculum for prospective teachers focuses on how prospective teachers teach their students about increasingly competitive global economic condition, mutual cooperation among business actors, entrepreneurial ability, and their superiority in labor market competition. (13).

21st century skills, also known as 4Cs super skills, are skills that prospective teachers must have to guide their students later on to be able to adapt and live in the web, smartphone and other distance learning based digital era. So, the consequence is that curriculum innovation is needed to achieve these skills (14).

A series of courses arranged in a curriculum helps students entirely achieve 21st century skills in the forms of abilities in: creativity and innovation, critical thinking and problem solving, communication and collaboration, digital citizenship, research and information fluency, and technology operations and concepts (12). In its turn, 21st century education is more directed at the development of generation who are knowledgeable and have the skill of utilizing technology. (15). Global economy, with open interactions with various cultures, also requires prospective teachers to be able to communicate and tolerate multiculturalism (13).

Furthermore, 21st century education also aims to prepare future generation to be able to face the following conditions; (1) preparing students to be able to solve problems that currently do not appear yet, (2) preparing students to be able to work in career fields that currently do not exist yet, and 3) preparing students to be able to use technology that currently is not yet found. (15). In facing various educational challenges above, the role of proficient teachers with skills and competencies is needed.

So, the existence of education programs for prospective teachers is very essential to prepare future teacher candidates. Prospective teacher education programs are expected to provide opportunities and challenges for prospective teachers to face various uncertainties in the future. This phenomenon in its turn leaves a big task for a number of prospective teacher education programs to produce future teacher candidate graduates who have super skills (4Cs) in order to meet the demands of 21st century education.

Prospective teachers in the 21st century are experts at solving problems that occur and have pedagogical skills that will support the achievement of 21st century educational goals (16). A number of prospective teacher education programs at tertiary institutions seek to make changes to their education systems and curriculums to change teaching skill practices from traditional to adjusted to the learning needs of the 21st century.

Project-based learning has been widely used in learning in various countries. This study of literature review was intended to contribute more about the implementation of project-based learning during the Covid-19 period through the use of online platforms. This study identified the stages, implementation principles, implementation steps and benefits, and several tips about the implementation of project-based learning from…articles published in…-…. This study is expected to encourage researchers and education practitioners as well as become state-of-the-art and an addition to their theories, which is necessary to carry out studies and for publication of articles on project-based learning approach.

Thus, the analysis of this study addressed the following research questions:

1. What are the steps in project-based learning for improving 4Cs skills?

2. What are learning activities for enhancing critical thinking and problem solving?

3. What are learning activities for enhancing creativity and innovation?

4. What are learning activities for improving communication skills?

5. What are learning activities for improving collaboration skills and collaborative digital era?

2. METHOD

2.1. Delimitations and the search for literature

This study limited the search for literature to the topic of project-based learning and the stages of its implementation so that it is relevant to be one of the alternative methods that can be applied to learning condition in the Covid-19 era which makes face-to-face learning unable to be implemented. Project-based learning is implemented as an effort to develop students' 4Cs in order to be successful in completing their education and in their lives in the 21st century era.

2.2. Data analysis and filtering of the research process

This study was conducted through content analysis to analyze reference journal articles on project-based learning published from 2005 to 2020. (17) Content analysis is a method that examines the content of written texts, artifacts, images, and recordings. The use of content analysis aims to link the data which are related to each other, analyze themes that readers can read comfortably and practically, and be able to be used by researchers as references for potential future studies (18). The sample investigated in this study was 47 peer-reviewed scientific articles published from 2015 to 2020. The reference journals indexed in the leading databases (Social Sciences Citation Index (SSCI) / Thomson Reuters and Scopus) were found through electronic databases such as Science Direct (http://www.sciencedirect.com/), Taylor & Francis Online (http://www.tandfonline.com/) and ERIC journal.

3. RESULT AND DISCUSSION

Based on the analysis using the VOS-viewer application, there were 5 clusters that linked one keyword to another. The following is the concept map of the research focus.
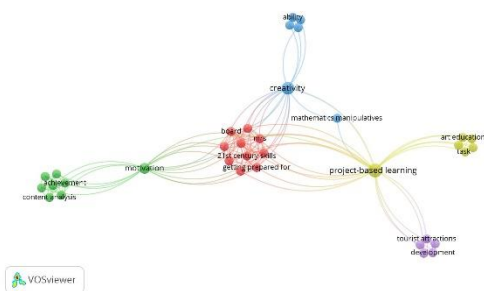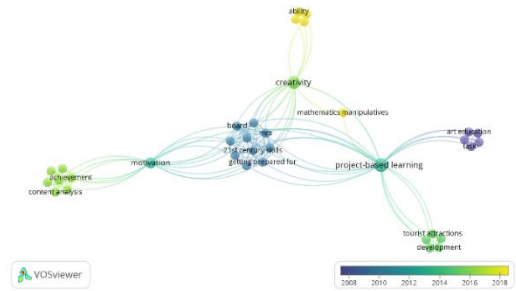

Figure 1: Clusters Based on Keywords

Figure 2: Based on Publication Date

3.1. Partnership for 21st Century Skills (P21) and 4Cs Skills

Based on the investigation with qualitative meta-data analysis, the information on 21st century skills from previous studies were obtained. It had been associated with several important variables in the studies, including its relationship with creativity; in the past, learning was associated with motivation, and in the same cluster it was associated with authentic learning, with inquiry and new learning. Then, in the latest research activities, it has been associated with project-based learning. The following figure illustrates the relationship between the 21st century skills concept and the other concepts.
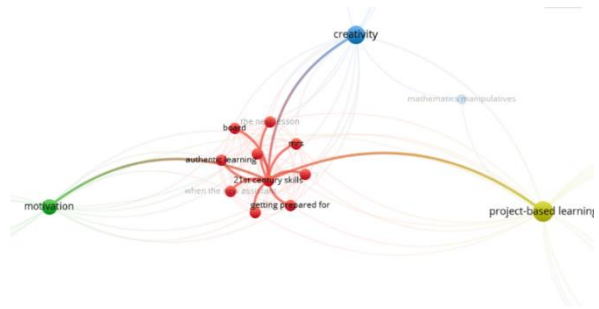

Figure 3: Partnership for 21st Century Skills (P21) and Its Relation to the Other Concepts

Partnership for 21st century skills (P21), also introduced as super skills or 4Cs skills, are soft skills that can help students enter the world of work and the work environment in the 21st century (19). Three skills that are most needed in the 21st century is:

1. Learning and innovation skills
2. Information, media and technology skills
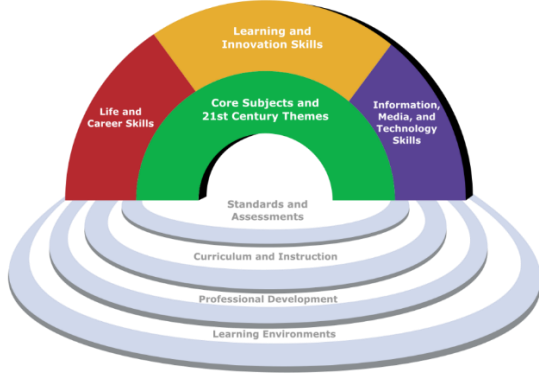3. Life and career skills

Figure 4: P21 Framework for 21st Century Learning

Learning in the 21st century requires at least 3 skills that must be acquired, namely information literacy skills, media literacy skills and information and communication technology literacy skills (15). Here is the rainbow conceptual framework for 21st century learning.
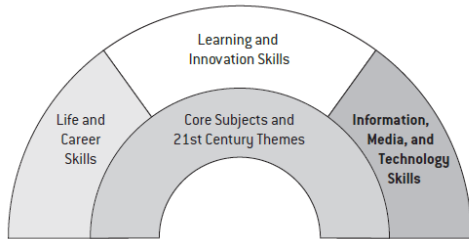

Figure 5: Learning The 21st Century Knowledge-and-Skills Rainbow

AMA (American Management Association) defines 21st century skills with the term of 4Cs "critical thinking and problem solving; effective communication; collaboration and team building; and, creativity and innovation," (20) and further (21) explains learning strategies to create the 4Cs skills. The strategies include: (a) becoming aware and literate of Web 2.0 tools; (b) determining problems and real-world problems to be solved by students using technology; and (c) creating collaborative problem-based learning experience by making use of resources available on webs.

According to Partnership for 21st Century Learning (2011a), 4Cs skills are learning and innovation skills that students must master in order to prepare themselves for life after school. Furthermore, National Education Association (2015) explains that 4Cs skills need to be fully integrated into the learning process to produce future society who are ready to face all challenges and opportunities in the 21st century. 4Cs skills are the

skills that are different each other, but mutually dependable and related to each other in presenting super skills for the 21st century Lippl (2013).

This condition in its turn becomes a new challenge for prospective teachers to produce future generation who are able to compete. Of course, to answer this challenge, prospective teachers must have 4Cs skills (communication skills, collaboration skills, critical thinking skills, and creativity skills) (11). These 4Cs skills are needed to guide their students to be able to adapt and live in the web, smartphone and distance learning based digital era. Curriculum innovation is needed to realize these skills (14).

3.2. Project-Based Learning, Motivation, Learning Engagement and Learning Output for Creativity and Innovation
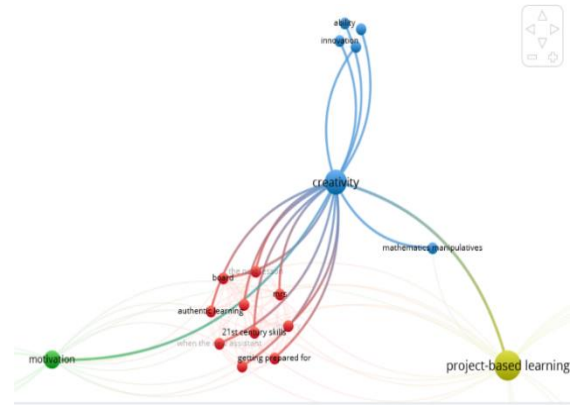

Figure 6: P21 Framework for 21st Century Learning

Creativity is a process that produces novelty, that is useful, sustainable, or satisfying for humans (22). The implementation of PBL has been proven to improve students' skills, especially creativity. The creativity that is improved with the implementation of PBL is related to several aspects, including fluency, flexibility, originality, and novelty (23). Fluency can be measured by assessing the number of answers conveyed by students. Flexibility can be measured through the number of variations of students' ideas to answer problems. Originality is measured through the question of whether the answers made are different from other students' or whether the answers conveyed are unusual answers. Newness is the measure of students' innovative answers (24).

Table 1. Map on Based Data, RIS, Titles and Abstract Field, Accuracy

Cluster	Keyword	Link	Total Link Strength	Accurence
1	21 century skills	12	12	1
	Authentic learning	12	12	1
	Board	12	12	1
	Getting prepare for	12	12	1
	Inquiry	12	12	1
	Principal walked in	12	12	1
	The next lesson	12	12	1
	When the new assistant	12	12	1
2	Achievement	7	7	1
	Bloom's revised taxonomy	7	7	1
	Content analysis	7	7	1
	Engagement	7	7	1
	Flipped classroom	7	7	1
	Interaction	7	7	1
	Motivation	19	19	2
	Research trend	7	7	1
3	Ability	4	4	1
	Creativity	17	18	3
	Innovation	4	4	1
	Mathematics manipulatives	2	2	1
	Pedagogical technologies	4	4	1
	Project-based method	4	4	1
4	Art education	5	5	1
	Cross-curriculum instruction	5	5	1
	Multicultural education	5	5	1
	Project-based learning	23	24	4
	School gardens	5	5	1
	Task-	5	5	1
5	Development	5	5	1
	S Culture	5	5	1
	Tourist attractions	5	5	1
	Young local tour guide	5	5	1

Learning that is carried out must contain creative activities that are able to develop abilities such as in thinking, comparing, analyzing and the combination of all these processes that will form students' creativity. Creativity can be taught and can develop in students' selves. To enhance students' creativity, project-based learning is one of the appropriate alternatives. The development of creativity through project-based learning is with projects and the creation of ideas in doing practical assignments based on the theoretical knowledge that students already have to produce works with the element of novelty under the guidance of teachers or instructors (25). PBL practice provides students with opportunities to develop life skills through a semi-guided process, allowing the students' freedom in choosing the projects. The life skills are what is most felt important by students, including responsibility, self-direction, collaboration, communication, creativity, and work ethic (26).

PBL also involves students' efforts to produce solutions to various complex problems (27). Since the answers to these complex problems will not be found on Google, it is necessary to have creativity skills in considering new ideas to develop appropriate and creative solutions to these problems. PBL helps students to generate new ideas that have never appeared before, or treat existing ideas in new ways so that they have their own novelty (28). Moreover, PBL also facilitates students to have working groups as places to discuss their ideas (5).

To develop students' creativity skills through project-based learning, there are several stages that need to be carried out. The first stage is to do research. Students, under the guidance of a teacher, are involved in solving problems, selecting and strengthening the project theme, planning future activities, and identifying the main objectives and tasks arising from the project theme. The second stage is to use technology in doing the project. The students have to design the learning with creative elements and prepare all the necessary props (selecting reference materials, determining learning format, and designing power point slides, posters and others). Next, every student under the guidance of the teacher begins to determine the character of work to be produced, which includes the definition of type of lesson, methodology, handouts, and the organization/ distribution of lesson time; terms and the schedule of work; the development of contents; and the selection of materials on the project topic and output. The final stage is to present project defense and evaluate the result. The project defense presentation includes the demonstration of videos, public defense, games with the students, guessing crosswords, role play, reporting new information, etc. All of these stages help to enhance creativity broadly. (25).

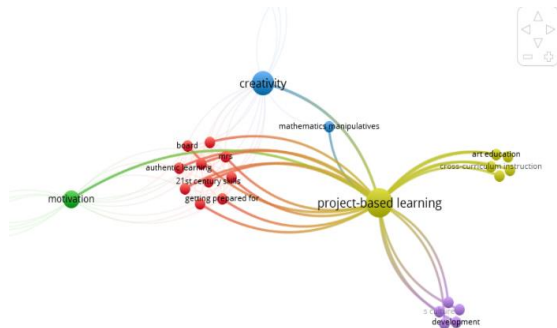### 3.3. Project-Based Learning and Super Skills P21

Figure 7: Project-Based Learning and Super Skills P21

Project-Based Learning (PBL) is a learning technique that changes learning from 'teachers tell' to 'students do', in which students are given assignments based on challenging questions or problems that involve students' problem solving, decision making, meaning making, and investigation and reflection skills (29). Project-based learning also provides teachers with opportunities to teach out of textbooks, incorporate real-world activities and projects into lessons, and actively teach with students as they learn (30). Project-based learning also enables students to develop not only knowledge, but also skills

necessary to be successful in school and in life. (31) PBL is a student-centered approach which aims to engage students and develop 21st century skills such as critical thinking, problem-solving skills, communication skills, collaboration skills, and creativity. As for the relationship between PBL and 21st century skill development, a recent study revealed that the teachers using PBL showed more improvement in 21st century skills than those in the control group (32). Furthermore, the benefits of integrating PBL into learning can lead students to deeper understanding of topics, higher reading quality, and the increase in motivation in learning. (5)

PBL is expected to be a solution to the situations of the innovation of technology, the complexity of interaction in virtual classrooms during Covid-19, and the occurrence of disruptive innovation. The objectives of project-based learning in economy, business/management and accounting are:

1. Facilitating students to be able to read economic, business, management and accounting situations in environment, public media, social media, and other online media.

2. Helping students to be able to make a critical question on current economic, business, financial and accounting situations.

3. Facilitating and guiding students to arrange an investigation design for the question proposed, look for theories, find suitable tools to analyze and find temporary answer (hypothesis) to the question proposed.

4. Facilitating students to process data with appropriate tools (cognitive tools) to draw conclusion of the results of the investigation.

5. Facilitating students to collaborate or cooperate with peers in the media used for finding ideas, concepts and the result of the project made.

6. Facilitating students to build a constructive learning community.

7. Familiarize students with using electronic media/information technology and social media for the learning atmosphere.

8. Producing a learning product (output) in the form of article, policy design, further research plan, or better learning design in improving the pedagogical ability of prospective economics teachers. (33)

To make PBL an effective learning, students have to (1) understand information, (2) reflect on how it will impact several aspects of a person's life, (3) compare how the information corresponds to our

own experience, and (4) think about how the information offers us new ways to act. Learning requires more than just seeing, hearing, moving, or touching to learn. Learning must integrate their feelings and thoughts into what they feel and how they behave. (34) Project-Based Learning (PBL) has four main components: (1) realistic problems, (2) structured group work, (3) multi-faceted assessment, and (4) participation in a professional learning network. These mean that students in a PBL class spend more time learning about important content through experience that emphasizes critical thinking, collaboration, creativity, and communication (35).

3.4 Project-Based Learning and Critical Thinking

(36) found that the implementation of project-based learning facilitated higher level of learning and understanding related to the mastery of certain concepts thereby improving academic performance. Project-based learning technique is a student-centered approach, positively changing students' attitude towards material that contributes to the improvement of academic performance. (27) suggests that the use of the PBL method allows students to develop major skills such as collaborative work, and capacity and ability to solve complex problems.

The ability to solve complex problems or students' critical thinking can be realized through some steps in PBL. Firstly, each individual or group begins to investigate information on a specific topic. So, students offer a suggestion for solving a problem. This suggestion is known as 'Project Plan' in school. Then, each individual or group collects necessary information and documents to support the topic. They conduct experiments, make observations, collect and interpret the data and record the results. Lastly, each group makes a report and present the lesson in class (37). The presented projects are discussed and evaluated overall by the students and the teacher.

Quality PBL will be successful if it applies 6 learning principles. The first principle is to be suitable. The implementation of PBL must be in accordance with the standards and concepts contained in subject, disposition and skill-based standards when planning a project. The second one is to build the practice of being a facilitator. PBL develops students' environment to practice autonomy, focusing on developing their own learning, seeking answers or solutions to questions or problems, practicing working in groups, and producing quality works. The third one is to manage activities. A teacher in PBL learning provides a

structure in which students can organize and manage their work, schedule, time, resources and creative process, and publish/ share their products. The fourth one is a brief explanation of students' learning tools. A teacher in a PBL class uses a variety of instructional learning, strategies, and tools to support students in achieving goals. The fifth one is to assess students' learning. A teacher in a PBL class uses formative and summative assessments in addition to integrating self-assessment and/or peer-assessment on students' works. The sixth one is to involve and train. A teacher in a PBL class learns and creates with students in addition to building skills, encouraging progress, praising, directing, and celebrating with students as needed (38).

To improve students' critical thinking skills in PBL learning, what the teacher needs to do is provide appropriate instructions and pay careful attention to students' abilities. Students are encouraged to use, revise, and deepen previous knowledge with assignments that require them to build new knowledge by reading, writing, and utilizing other scaffolding tools to support their better achievement (32).

3.5 Project-Based Learning and Communication Skills

Communication includes both verbal and non-verbal activities. Communication based on the rapid development of information currently involves interactions that take place in various regions; this shifts the traditional communication paradigm that requires face-to-face meetings (39). Communication in the 21st century era involves not only face-to-face interaction but also the use of information technology, digital literacy, email, text messages, social media and virtual environment to deliver messages and information (40). Communication involves a big number of 21st century skills such as analytical, evaluation, problem solving, metacognitive, collaborative, and technological skills (41). (42) The implementation of project-based learning has improved students' communication skills because they have opportunities to convey ideas and responses to learning. Students' vocabulary skills also improve. Significant progress in reading and writing increases when students are asked to learn and analyze reading sources related to their proposed research topics to design their own technological products, each of which has special characteristics and novelty. The four findings also showed the improvement of the students' PBL skills to use technology, namely designing power point presentations and making videos and communicating them to their peers and teachers.

(43) Based on the implementation of PBL in their classes it was found that; (1) the students found that the process of working with their group members and engaging in the online peer review helped them communicate and perform better; (2) developing creativity through the multimedia production process produced many creative project ideas that were impossibly included in regular class activities; (3) developing critical thinking skills through project creation helped the students broaden their views on the project theme. The process also improved their critical thinking skills in terms of researching and analyzing the data to draw conclusion of the project; (4) the students were involved in creating the digital project for international consumption partnered with the activities that were fun to do; (5) the students' technological skills increased by demonstrating the improvement of the use of digital media through the project; and (6) the students' sense of responsibility in completing the project and working with others increased.

3. 6. Project-Based Learning and Collaboration

Collaboration is an important skill that can be developed through PBL. Collaboration in PBL is seen in the increase in students' abilities in team management, making substantive decisions together, learning from others and contributing to providing learning for others (Fullan & Scott, 2014). In developing collaboration skills, prospective teachers must also have skills in listening and respecting various perspectives in the context of problem solving (44). For the success of project-based learning, collaborative skills are needed. Groups of students have to successfully face challenges that may arise while working in teams (45).

According to the results of study conducted by Buck Institute for Education (BIE): PBL and 21st Century Competencies (2012), PBL was proven to increase the students' ability to collaborate with others in resolving the conflicts (46). In completing a joint project, students will develop their communication skills, respect others' opinions, and together look for the best ideas to solve problems (27).

During PBL, students will work together in their groups starting from planning the project to discussing further the title, description, objectives, project implementation steps, implementation, and the division of tasks for each group member (47). Collaboration skills in PBL are also seen in the attitude of students who are able to respect other people's opinions, solve problems with various

opinions, contribute and be responsible for assignments given to groups, and be open-minded about new and different ideas or thoughts (Beers, 2012).

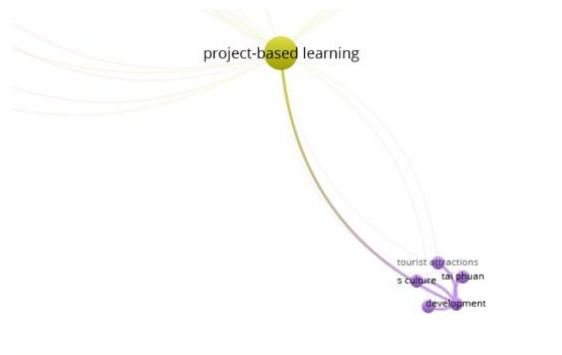## 3.7 Project-Based Learning and Learning Development

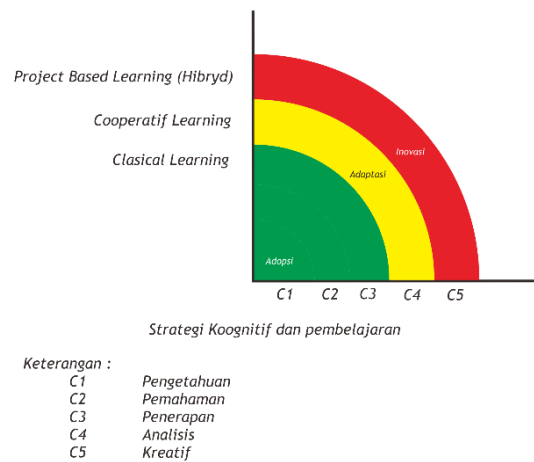**Figure 8: Project-Based Learning and Learning Development**

Figure 9: The Relationship between Learning Strategies and Bloom's Taxonomy

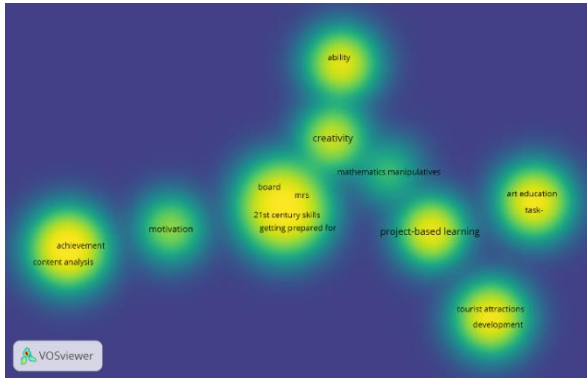## 3.8 Contribution and Plans for Future Research

Figure 10: The Density of Research Studies and the Opportunities for Future Research Development

An amount of literature on project-based learning as one of the appropriate learning models to be used to develop students' abilities in the 21st century era has been referred to. Previous studies only examined the use of project-based learning partially to develop critical thinking, creativity, communication and collaboration, but in this study the relationship between PBL and 4Cs was fully examined. The previous studies on project-based learning were carried out in normal condition with face-to-face meetings and, in some studies, it was implemented with online system. In the Covid-19 pandemic, online learning has become one of the main forms of learning, and project-based learning has been believed to be a good alternative in the implementation of online learning. So, as a continuation of the availability of theories from this study, it is expected that, in the future, further research is carried out to: 1) empirically find out to what extent project-based learning contributes to achieving learning outcome in Higher Education; 2) reveal the effectiveness of the implementation of project-based learning on the sides of the roles of lecturers and students; and 3) elucidate the difficulties in implementing project-based learning without face-to-face meetings.

4. CONCLUSION

The mastery of 4Cs skills (communication skills, collaboration skills, critical thinking skills, creativity skills) is very important for prospective teachers to be able to develop their potential in the 21st century era. One of the efforts to grow 4Cs skills of prospective economics teachers is by implementing project-based learning. Project-based learning carried out in the Covid-19 era must be able to facilitate students to be able to read the situations,

formulate critical questions about the existing situations, arrange an investigation design, and find suitable tools to analyze and answer the existing problems. The learning should also be able to facilitate students with right tools to produce conclusions. The learning that is carried out should allow students to collaborate and form a constructive community. The learning carried out should familiarize students with using electronic media and make students be able to produce products in the forms of articles, policy designs, further research plans, or better learning designs in order to improve prospective economics teachers' pedagogical skills.

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