

# Development of Assessment Instruments in Project Based Learning to Measure Collaboration Skills and Compassion for Students in Elementary School

*By Rochmiyati Rochmiyati*

TIJOSSW is Available Online at:

<https://www.growingscholar.org/journal/index.php/TIJOSSW>

Vol. 3 No. 1, June 2021, pages: 218~227

DOI: <https://doi.org/10.5281/zenodo.5044958>

ISSN **2690-5167**

Growingscholar Publisher



## Development of Assessment Instruments in Project Based Learning to Measure Collaboration Skills and Compassion for Students in Elementary School



Wardani, Danti Ayu<sup>1</sup>, Rosidin, Undang<sup>2</sup>, Rochmiyati<sup>3</sup>

Article history: Received April 25, 2021; Accepted: May 29, 2021; Displayed Online: June 30, 2021; Published: June 30, 2021

### Keywords

*Assesment Instruments*

*Compassion*

*Collaboration*

*Project Based Learning*

### Abstract

This study aims to develop an assessment instrument in project based learning to measure collaboration skills and compassion for students in elementary school. The type of research and development used refers to the R&D theory of Borg and Gall. Population of this research was three schools in the Apple cluster, Sukarame district. The sample of this research were the fifth grade students of SD Negeri 1 Way Dadi. Data collection techniques using non-test in the form of observation, questionnaires, and documentation. Data analysis uses validity, reliability, and effectiveness. The results of this study indicate that the assessment instrument in project based learning to measure collaboration skills and compassion for students in elementary school which are properly developed with theoretical feasibility, practically, and effectively.

### 1. Introduction

Learning assessment is an important and inseparable part of the learning system. Assessment used a tool in the form of an instrument. Assessment instruments can be carried out on various learning models that are recommended in the 21st century including inquiry, discovery, problem based learning, and project based learning. One of them is the project based learning model which is usually abbreviated as PjBL, according to Baron (2011: 29) is a learning process using real projects in life. The assessment instrument in project based learning is a tool used to assess students according to the stages in project based learning that challenge and motivate students in learning.

<sup>1</sup> Postgraduate student, Lampung University, Lampung, Indonesia. Email: dantiwardani565@gmail.com

<sup>2</sup> Senior Lecturer at Lampung University, Lampung, Indonesia. Email: undangros@yahoo.com

<sup>3</sup> Senior Lecturer at Lampung University, Lampung, Indonesia. Email: rochmiyatiazwardi@yahoo.co.id

The stages of project based learning consist of several activities carried out by students in completing project assignments. Aldabbus (2018: 74) explains the 7 stages of project based learning, including starting with the essential question (determining basic questions), designing a plan for the project (designing project plans), creating a schedule (compiling a schedule), monitoring the students and the progress of the project (monitoring students and project progress), assessing the outcome (testing the results), and evaluating the experience (evaluating experience). Moses' opinion in Wiedmann (2017: 11) states that the learning process carried out through the project based learning stage can improve skills in attitudes such as team work, collaboration skills, compassion between group members, and achieving high-level abilities needed in the 21st century such as thinking skills critical and creative. This is in line with Pranowo's research (2013: 225) where project-based learning is the main learning that can be used in learning activities to develop collaboration skills (collaboration), and students' compassion skills using assessment instruments.

Collaboration skills can train students to work together in groups, construct knowledge, participate in making decisions, and find the right conclusions to solve problems in learning (Mahanal, 2018: 601). This collaborative process can be mapped into various stages according to Gash in Noviana (2019: 140) namely the existence of face-to-face dialogue, building trust (trust building), building commitment to the process (commitment to the process), share understanding (shared understanding), and then the formation of an interim outcome (intermediate outcome). Other forms of social attitude interaction skills are compassion skills which are the main character in each student and are the concepts that underlie quality and human relations. Compassion is a matter of how we treat each other by showing a kind attitude, willing to share, help, and give. Compassion skills are essential for effective and meaningful learning in the classroom. This is also expressed by Smylie (2016: 312) as follows:

“Compassion skills is a social skill to make students a positive and meaningful classroom in the learning to take place effectively. Compassion skills are social skills to make students positive and meaningful in the classroom so that learning takes place effectively”.

In fact, the collaboration skills and compassion of students are difficult to assess, and the assessment instruments for collaboration skills and compassion are rarely used by educators, where educators in learning, especially the 2013 curriculum, emphasize only cognitive assessment instruments.

Sari (2017: 5), Prasanti (2017: 10), and Prasetyo (2018: 456) stated that the learning process is still centered on educators with the lecture method, the development of learning models is still minimal, teaching materials are focused on one teaching material, namely student books or books. In the teacher's book, the assessment process is still oriented towards cognitive assessment, although in reporting the assessment includes an assessment of attitudes (affective) or KI-2, knowledge (cognitive) KI-3, and skills (psychomotor) KI-4.

This happens because there are several factors that affect the difficulty of assessing collaboration skills and compassion, explained in the Regulation of the Minister of Education and Culture Number 57 of 2014 some of these factors include low commitment, inadequate ability and knowledge, limited supporting facilities, willingness politics, both the central, regional, and school governments, and the ineffective dissemination of information. Changes in assessment policies generally have an impact on the development of educators both physically and mentally. The 2013 curriculum which requires educators to assess social attitudes has many problems. This burden on the minds of educators makes them reluctant to assess social attitudes, especially collaboration and compassion for students.

---

Similar problems are also contained in Nowreyah's research (2014: 209) says:

"Many educators complain about the assessment and the factors that hinder its implementation. Some of these factors are related to the attitude of educators towards assessment, where some think subjective assessment is difficult, some other educators think it takes time, especially in large classes and there are educators who do not have knowledge about how to assess collaboration and compassion".

4

Based on the results of preliminary research **needs analysis** through a questionnaire regarding assessment instruments in project based learning to measure student collaboration and compassion with a target of 15 fifth grade educators, it was found that educators need an assessment instrument in project based learning to measure student collaboration and compassion that is easy, clear, practical, and according to the conditions of learning in schools. Where 13.3% of educators do not know how and have not implemented effective assessment in their classrooms. In addition, 80% of the affective assessment instruments used in classroom learning are products from the government, and only 13.3% of educators develop their own affective assessment instruments. The application of affective assessment, especially in measuring collaboration and compassion for students, has 80% of educators having difficulties. Regarding the learning process using the project-based learning model, 93.3% of educators already know and do it, but 73.3% of educators have difficulty in learning using this project-based learning model. Educators also need to make effective assessment instruments that are in accordance with school conditions and need feedback for educators to improve teaching. The principal supports educators to innovate or update the assessment instrument. However, until now educators still find it difficult to develop assessment instruments, especially affective assessments, so that affective assessments cannot be carried out optimally.

6

Further preliminary research was conducted through a questionnaire to determine the response of students regarding the implementation of the project based learning model. Questionnaires were given to 20 students in class V and the results showed that students in class V had done tasks in the form of projects such as making designs, writings, works of art, technological works or crafts, but 40% of students still did not understand how to make assignments in the form of projects. that. Students do not understand how to make assignments in the form of this project starting from planning, implementing, to reporting results according to the stages of the project based learning model.

Based on the needs analysis above, it can be concluded that the assessment applied is less than optimal, especially for affective assessment instruments. Educators have difficulty understanding the attitude assessment criteria from the existing guidelines in the teacher's book and have not developed their own affective assessment instruments. So, the researcher will conduct a development entitled "Development of Assessment Instruments in Project Based Learning to Measure Collaboration Skills and Compassion for Class V Elementary School Students".

## 2. Materials and Methods

### *Assessment Instrument*

It is important in the assessment to make an assessment tool or instrument. Generally, the assessment instrument is a tool to collect data on the results of the learning process. Daryanto in Wardah (2018: 34) explains that assessment instruments are factors that have a relationship or influence on student learning outcomes and the success of achieving a particular program. Furthermore, Tan (2006: 35), explains that the assessment instrument is a tool that meets academic requirements, so it can be used as a tool to measure a measuring object or collect data about students. An assessment instrument is a tool used to collect data in a study or assessment. Collecting research or assessment data, one can use instruments that are already available or standard instruments and can also be made with instruments that are made themselves (Rosidin, 2017: 40).

### *Compassion*

Humans living in this world definitely need other humans to carry on their lives, because basically humans are social creatures. Alder (2002: 250) explains compassion is a matter of how we treat each other, be kind, willing to share, help, and give. Meanwhile, Smylie (2016: 312) explains "Compassion skills is a social skill to make students a positive and meaningful classroom in the learning to take place effectively". Chandrakumara (2015: 329) explains that there are five indicators of compassion skills, namely compassion for others, empathy, and sharing.

### *Collaboration*

Collaboration or a form of social attitude interaction in which there are certain activities aimed at achieving common goals. As explained by Wiedmann (2017: 12) regarding the key to collaboration skills which says that "keywords of collaboration skills are team membership, meets obligations, and group participation". Abdulsyani in Breitbach (2018:15) says that collaboration means working together to achieve goals and is the most basic social attitude process. Usually collaboration involves students in the division of tasks, where everyone works in the learning process and combines thoughts until they find a solution. Indicators of collaboration skills according to Greenstein in Mahanal (2018: 601) include love performing tasks in collaboration with accountability and responsibility, effort in work, time management in work, and interaction skills during work.

11

### *Project Based Learning*

Project-based learning or project based learning is learning that is prioritized in the 2013 curriculum and 21<sup>st</sup> century learning. The same opinion Ber and Erickson in Wardah (2018: 49) assert that project based learning is an approach that focuses on the main principles and concepts of a discipline, involving participants students solve meaningful problems and tasks, thus building learning, and ultimately producing real work. The stages of project based learning according to Lee (2016: 710), Tan (2006: 36), and Aldabbus (2018: 74) include start with the essential question, design a plan for the project, create a schedule, monitor the students and the progress of the project, assess the outcome, and evaluate the experience.

---

#### *Time and type research*

This research is began in August 2020. The type of research used in this study is Research and Development (R&D) methods. According to Borg and Gall (1983: 775) R&D research method is a development research method used in producing a product. This research only carries out seven steps, namely research and information collecting, planning, developing preliminary form of product, preliminary field testing, main product revision, main field testing, and operational product revision.

#### *Research Subjects*

Determining the subject or sample in this study using non-probability sampling with a purposive sampling technique, namely a sampling technique with certain considerations. This study considers the determination of the sample based on the results of the questionnaire in the preliminary study, namely SD Negeri 2 Way Dadi as a small group trial sample consisting of 10 students and 3 educators for class V, and SD Negeri 1 Way Dadi as a large group trial sample consisting of 30 participants students in class V.

#### *Procedure*

The non-test technique is used to obtain qualitative data by reviewing the assessment instrument in the form of a questionnaire. The questionnaire in this study consisted of three, namely: a needs analysis questionnaire during field observations, an expert validation questionnaire, a practitioner / educator response questionnaire. The data that will be processed is data in the form of comments, suggestions, and product improvements from expert validation. The questionnaire for the assessment instrument sheet is assessed by giving a check mark (√) according to the indicators in the item questions. The research data collection was carried out through several stages, there are; (1) students learn according to project-based learning steps (2) as long as participants do project assignments, educators observe students' collaboration skills and compassion using observation sheets (3) after getting scores from observations of collaboration skills and compassion, educators process values according to criteria (4) the same thing is done for six lessons.

#### *Instrument*

This research instrument is an instrument to assess collaboration skills and compassion used when students work on project assignments. The instrument is an observation sheet consisting of several indicators. Before the instrument was applied to students, the product was evaluated by experts to see the theoretical feasibility and evaluated by educators and students to see its practicality by using a questionnaire. Validators consist of evaluation experts, material development experts, and language experts. Expert and practitioner advice is used to revise the product. Feasibility analysis is obtained by using the following formula.

Final scores were converted into the following categories as shown in Table 1 below.

Table 1. Criteria for evaluation of items by Experts and Practitioners

Interval	Score Description
82 – 100	Very Good
63 – 81	Good
44 – 62	Good Enough
25 – 43	Not Good

Sudijono in Noviana (2019: 144)

Then the instrument was tested on students and assessed for validity, reliability, and effectiveness using the one sample t-test. The results of the one sample t-test effectiveness test if it shows a significance value above 0.05, thus the hypothesis is accepted or it is said that the instrument is effective in measuring the collaboration skills and compassion of students.

### 3. Results and Discussions

Based on the research results, it was found that educators put more emphasis on cognitive assessment compared to affective and psychomotor assessments of students, affective assessment instruments have not been developed by educators and only use affective assessment instrument products from the government, namely teacher books, educators have difficulty understanding the assessment criteria affective, especially in measuring the collaboration and compassion of students, then the project based learning model has been used but educators have difficulty in implementing it. Therefore, an assessment instrument for project based learning was developed to measure these collaboration skills and compassion which are feasible theoretically, practically, and effectively.

#### 1. Theoretically Feasible

The feasibility of the assessment instrument theory in project based learning to measure collaboration skills and compassion is seen from the results of the assessment of three experts, namely evaluation experts, material experts, and language experts. Based on the results of the assessments of three experts, this assessment instrument is theoretically feasible because it obtains an evaluation expert score of 80, material expert 92.5, and linguist 93.75. The average expert score as a whole is 88.75 in very good criteria. The research above is in accordance with the theory of Sunarti and Rahmawati (2014: 135); Wahyuni and Ibrahim (2012: 56); Permendikbud Number 104 of 2014 which states that when compiling instruments it is necessary to pay attention to construction/evaluation aspects, material aspects, and language aspects.

The construction of the instrument in this research and development was assessed by an evaluation expert. In addition, the analysis of substance or material is assessed by material experts in the form of studies related to scientific substance, especially project material, while language analysis is assessed by linguists in the form of studies relating to the use of good and correct Indonesian. Validation of assessment instruments carried out by experts based on validation questionnaires is to provide assessments, suggestions.

---

This study has similarities with the results of Noviana's research (2019: 143) which states that the validation of the project-based learning-based collaboration skills instrument is very good and feasible in construction, substance, and language with a very good level of validity so that it can be used. In addition, according to the advice of the evaluation expert, Dr. Lilik Sabdaningtyas, M.Pd. and Noviana (2019: 143) that:

“A good assessment instrument must consist of a grid of instruments, assessment sheets, rubrics, and scoring guidelines. A good assessment instrument must consist of a grid of instruments, scoring sheets, rubrics, and scoring guidelines.

The indicators of collaboration skills in this research refer to Greenstein's theory in Mahanal (2018: 601), namely love performing tasks (love of carrying out tasks), effort in work (work effort), interaction skills during work (interaction during work), and time management (time management). The explanation of the collaboration indicators is very appropriate or appropriate to use to work on project tasks through the project based learning step where students are responsible for their roles, then good interaction occurs when working on project assignments between students starting from the preparation of tools and materials to a successful work in make students with good time management.

## 2. Practicality

The practicality of the assessment instrument in project based learning to measure collaboration skills and compassion is seen from the results of small group trials and large group trials. This practicality assessment uses a practicality response questionnaire by educators and students consisting of aspects of attractiveness, convenience, and usefulness. The results of the practicality response of educators by 5 small and large group educators with an average percentage of 85.63% are very practical. While the results of the practical response of students by 44 small and large group students with an average percentage of 87.54% is very practical.

The responses of educators and students to the questionnaire stated that the assessment instrument developed has benefits, especially with project based learning, students can measure and develop the skills possessed by students, especially collaboration skills and compassion. These results are in accordance with the results of research by Noviana (2019: 143), Aldabbus (2018: 77), and Lestari (2017: 158) that the assessment instrument in project based learning is very appropriate to use observation sheets or observations during the process of working on project assignments. In addition, the assessment of project based learning has a significant influence on the development of skills possessed by students such as collaboration and compassion.

Based on the results of the study, the assessment of project based learning to measure collaboration skills and compassion developed has advantages when compared to the skills assessment instrument contained in the teacher's book. The following Table 18 is the difference between the assessment instruments resulting from the development and the existing assessment instruments.



Table 2. Differences in the Assessment Instruments developed with those already

No	Assessment Instruments	
	Yang sudah ada	Yang dikembangkan
1	The instrument is presented globally/generally not detailed skills that are assessed both process and product	The instrument is presented in detail the skills in the assessed aspects of both process and product
2	Has not included instructions for use so that educators have difficulty using it	Instructions for use of assessment are clear
3	The criteria in the aspects assessed aren't clear	The criteria used are clear to assess the skills of students, so they are easy to use

### 3. Effectiveness

The effectiveness of the assessment instruments in project based learning to measure collaboration skills and compassion is seen from the results effectiveness test in large group trials. This effectiveness assessment uses one sample t-test which is an analytical technique to compare one class of data or variables. This technique is used to test whether the value of collaboration skills and compassion from the results of this study differs significantly or not with the average of a sample. The results of the test of the effectiveness of the assessment instrument product on project based learning to measure collaboration skills and compassion based on the asymp sig (2 tailed) value for collaboration skills and compassion is  $0.00 < 0.05$ , it is concluded that it is effective. Measuring collaboration skills and compassion can be seen with observation sheets in lesson 1 to lesson 6 in each indicator. The results of achieving collaboration skills obtained an average percentage of 80.4% with high criteria. While the results of the achievement of compassion skills obtained an average percentage of 80.95% with high criteria. The instrument is said to be effective because it is detailed and clear about project assignments and a learning assessment sheet is provided. In line with Noviana (2019: 143) shows the results of his research that students are more enthusiastic in doing project assignments with a variety of detailed and clear activities so that monitoring the learning process and assessing student skills is easier.

8

### 4. Conclusion

Based on the results of research and discussion, it can be concluded that the assessment instrument in project based learning to measure collaboration skills and compassion developed is theoretically feasible. This is evidenced by the assessment of 3 experts namely evaluation expert, material expert, and linguist who stated that the assessment on project based learning to measure collaboration skills and compassion developed in the criteria was very good. In addition, the assessment instrument developed was valid and reliable. Then, an assessment instrument on project based learning to measure collaboration skills and compassion that was developed practically. This is evidenced in small group and large group trials through practical responses to aspects of convenience, attractiveness, and usefulness to educators and students in very practical criteria. And an assessment instrument in project based learning to measure collaboration skills and compassion that are developed effectively. This is evidenced by the results of the effectiveness test with a significance level value of less than 0.005 then  $H_a$  is accepted. Then this is proven again by the results of observations using the observation sheet for collaboration skills and compassion for students in very good criteria.

*Development of Assessment Instruments in Project Based Learning to Measure Collaboration Skills and Compassion for Students in Elementary School  
(Wardani Danti Ayu, Rosidin Undang, Rochmiyati)*

---

**References**

- Aldabbus, S. 2018. Project-Based Learning: Implementation and Challenges. *International Journal of Education, Learning and Development*. Volume 6 Nomor 3, 71-79.
- Alder, N. 2002. Interpretations of The Meaning of Care: Creating Compassion Relationships in Urban Middle School Classrooms. *Journal Urban Education*. Volume 37 Nomor 13, 241-266.
- Baron, K. 2011. Six Steps for Planning a Successful Project Learning. ([www.edutopia.org/main-project-learning-six-stepsplanning](http://www.edutopia.org/main-project-learning-six-stepsplanning)) Diakses pada tanggal 12 Oktober 2020 pukul 13.45
- Borg, W.R and Gall, M.D. 1983. *Eucation research: an introduction.4th Edition*. Longman Inc, New York.
- Breitbach, A 2018. Student Perceptions of Collaboration Skills in an Interprofessional Context: Development and Initial Validation of the Self-Assessed Collaboration Skills Instrument. *Journal Evaluation & the Health Professions*. Volume 1 Nomor 2, 1-23.
- Chandrakumara. 2015. Modeling Graduate Employability in Sri Lanka Using Binary Logistic Regression. *International Journal of Multidisciplinary Research and Development*. Volume 2 Nomor 9, 326-333.
- Lee, H.C. 2016. The Effect of Project-Based Learning on Learning Motivation and Problem-Solving Ability of Students. *International Journal of Information and Education Technology*. Volume 6 Nomor 9, 709-712
- Lestari, C. 2017. Karakter Peduli Sosial Peserta didik Dalam Pembelajaran Matematika Dengan Pendekatan Contextual Teaching and Learning di Kelas VII SMP Negeri 31 Banjarmasin Tahun Pelajaran 2016/2017. *Skripsi*. Universitas Lambung Mangkurat, Banjarmasin.
- Mahanal. 2018. Collaboration in Project Learning High School. *Journal International Technology and Education Desain*. Volume 12 Nomor 2, 600-613.
- Noviana, A. 2019. Development and Validation of Collaboration and Communication Skills Assessment Instruments Based on Project-Based Learning. *Journal of Gifted Education and Creativity*. Volume 6 Nomor 2, 133-146.
- Nowreya, A.N., Muneera, A.K. 2014. Primary School EFL Teacher' Attitude toward creativity. *International Journal English Language Teaching*. Volume 7 Nomor 9, 205 -218.
- Pranowo, J.D. 2013. Implementation Character Education of Compassion and Collaboration Through The Role Play Technique. *Journal of Asian and African Social Science and Humanities*. Volume 2 Nomor 4, 220-232.
- Prasanti. 2017. Pengembangan Instrumen Berbasis Proyek Pada Pembelajaran Tematik SD. *Tesis*. Universitas Yogyakarta, Yogyakarta.

- 
- Prasetyo, T.I. & Naniek. 2018. Pengembangan Instrumen Sikap Sosial Tematik Peserta didikSD Kelas IV. *Jurnal Ilmiah Sekolah Dasar*. Volume 2 Nomor 4, 455-461.
- Rosidin, U. 2017. *Evaluasi dan Asesmen Pembelajaran*. Media Akademi, Yogyakarta.
- Sari, D.A. 2017. Pengembangan Instrumen Penilaian Sikap Sosial Peserta Didik Sekolah Dasar. *Tesis*. Universitas Lampung, Lampung.
- Smylie, M., Murphy & Louis. 2016. Compassion Leadership in Schools: Findings From Exploratory Analyses. *Article Educational Administration Quarterly*. Volume 52 Nomor 2, 310 –348.
- Sunarti and Rahmawati. 2014. *Penilaian dalam Kurikulum 2013*. Penerbit ANDI, Yogyakarta.
- Tan, N.H. 2006. A Simple Instrument for the Assessment of Student Performance in Problem-based Learning Tutorials. *Journal National Center Singapura*. Volume 35 Nomor 9, 34-41.
- Wahyuni and Ibrahim. 2012. *Assesment Pembelajaran*. PT. Refika, Bandung.
- Wardah, F. 2018. Pengembangan Instrumen Authentic Assessment Berupa Penilaian Proyek Untuk Mengukur Kompetensi Keterampilan Siswa. *Skripsi*. UIN Sunan Ampel, Surabaya.
- Wiedmann. 2017. Team Word and Collaboration. *Journal of Asian and African Social Science and Humanities*. Volume 4 Nomor 1, 6-15.

# Development of Assessment Instruments in Project Based Learning to Measure Collaboration Skills and Compassion for Students in Elementary School

---

ORIGINALITY REPORT

---

9%

SIMILARITY INDEX

---

PRIMARY SOURCES

---

- 1 [eprints.iain-surakarta.ac.id](https://eprints.iain-surakarta.ac.id) 61 words — 2%  
Internet
- 2 A I Harahap, R O Bura, Y Ruyat. "Modeling And Simulating The Design of Air Defense Missile Aerodynamic Systems", Journal of Physics: Conference Series, 2020 32 words — 1%  
Crossref
- 3 [ejournal.radenintan.ac.id](https://ejournal.radenintan.ac.id) 24 words — 1%  
Internet
- 4 [repository.usd.ac.id](https://repository.usd.ac.id) 23 words — 1%  
Internet
- 5 Youmil Abrian, Arif Adrian, Rian Surendra. "ANALYSIS OF FACTORS AFFECTING GUEST DECISION IN PURCHASE OF ROOM SERVICE IN HOTEL "GRAND INNA PADANG"", Journal of Business on Hospitality and Tourism, 2019 22 words — 1%  
Crossref
- 6 [worldwidescience.org](https://worldwidescience.org) 20 words — 1%  
Internet

- 
- 7 S Sofiyan, R Amalia, A B Suwardi. "Development of mathematical teaching materials based on project-based learning to improve students' HOTS and character", *Journal of Physics: Conference Series*, 2020  
Crossref 19 words — < 1%
- 
- 8 A A Nugroho, D Juniati, T Y E Siswono. "An instrument measuring prospective mathematics teacher self-regulated learning: validity and reliability", *Journal of Physics: Conference Series*, 2018  
Crossref 16 words — < 1%
- 
- 9 Yunisca Nurmalisa, Elisa Seftriyana. "Teacher Role Analysis In Developing Communication And Collaboration Capabilities On Elementary Education Level", *Efektor*, 2019  
Crossref 16 words — < 1%
- 
- 10 Peter Aubusson. "Chapter 3 Evolution from a Problem-Based to a Project-Based Secondary Teacher Education Program: Challenges, Dilemmas and Possibilities", Springer Science and Business Media LLC, 2005  
Crossref 12 words — < 1%
- 
- 11 [www.boardofed.idaho.gov](http://www.boardofed.idaho.gov)  
Internet 12 words — < 1%
- 
- 12 "The Wiley Handbook of Problem - Based Learning", Wiley, 2019  
Crossref 10 words — < 1%
- 
- 13 Ahmad Syukri Endiawan, Irfai Fathurohman, Santoso. "Development Design Technology Comic Literacy Android Based E-book", *Journal of Physics: Conference Series*, 2021  
Crossref 10 words — < 1%

---

14 Krisna Merdekawati. "Skill development on designing chemistry learning", AIP Publishing, 2018 10 words — < 1%  
Crossref

---

15 Linda Dwiyanti, Rosa Imani Khan, Epritha Kurniawati. "Development of Smart Adventure Games to Improve the Readiness of the Initial Ability of Reading, and Writing on Early Childhood", Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, 2018 9 words — < 1%  
Crossref

---

16 S Y Sari, W S Dewi, Asrizal. "Validity of science teaching aids based on project based learning", Journal of Physics: Conference Series, 2020 9 words — < 1%  
Crossref

---

17 [www.growingscholar.org](http://www.growingscholar.org) 9 words — < 1%  
Internet

---

18 [www.ijicc.net](http://www.ijicc.net) 9 words — < 1%  
Internet

---

19 Heni Hirawati, Yacobo P Sijabat, Axel Giovanni. "Financial Literacy, Risk Tolerance, and Financial Management of Micro-enterprise Actors", Society, 2021 8 words — < 1%  
Crossref

---

20 Sri Handayani, Sri Umi Mintarti, Dian Rachmawati, Hari Wahyonono. "Development of STEM-Based Evaluation Tools for Economic Learning in SMA East Java in the Education Era 4.0", KnE Social Sciences, 2021 8 words — < 1%  
Crossref

---

21 [apsce.net](http://apsce.net) 8 words — < 1%  
Internet

---

22 K H Basuki, R Widyawati, S N Khotimah. "Hortipark Lampung as environmental friendly urban horticulture concept in Lampung Province", IOP Conference Series: Earth and Environmental Science, 2019 6 words — < 1%  
Crossref

---

EXCLUDE QUOTES ON

EXCLUDE MATCHES OFF

EXCLUDE BIBLIOGRAPHY ON