Vol 10(1) (2021): 48-56
DOI: http://dx.doi.org/10.24235/sc.educatia.v10i1.7660

SCIENTIAE EDUCATIA: JURNAL PENDIDIKAN SAINS

http://www.syekhnurjati.ac.id/jurnal/index.php/sceducatia

Teacher's Competencies in Designing Lessons to Improve Students' Learning Outcomes

Indah Faridah*, Wahidin, Ria Yulia Gloria

Department of Biology Education,Faculty of Teacher Training and Education, IAIN Syekh Nurjati Cirebon, Indonesia

*Corresponding author: Jl Perjuangan by Pass Sunyaragi Kesambi Kota Cirebon, Jawa Barat, Indonesia. E-mail addresses: indah.fda@gmail.com

article info

Article history:
Received: 03 January 2021
Received in revised form: 04 April 2021
Accepted: 10 June 2021
Available online: 30 June 2021

Keywords:
Learning design
Learning outcomes
Teacher's competencies

abstract

Teachers' competencies initiated this research in learning preparation, including planning and implementing the learning process, understanding materials, evaluating learning outcomes, and actualizing students' potential to develop. Therefore, teachers' competencies are necessary to design learning and improve learning outcomes. This study aimed to determine teachers' competencies to design learning and enhance learning outcomes. This research was descriptive qualitative research. It investigated conducted at SMAN 1 Ciwaringin in April 2019 (the second semester of the 2018-2019 academic year). The research subject was teacher IW. The data were collected using observation, documentation, and test techniques. The respondent's competencies in designing learning were seen from four aspects: syllabus, learning process, and evaluation. This research revealed that the teachers' ability to design learning tools, processes, and ways for class XI students at SMAN 1 Ciwaringin was good. Moreover, the students' biology learning outcomes increased significantly, as indicated by the pretest and posttest scores conducted before and after the learning. This study also discovered that the teacher IWs' ability to design learning improved students' learning outcomes.

1. Introduction

Learning planning is an effort to carry out the learning process; thus, it can run well and bring expected learning outcomes. Learning planning assists the learning process in the classroom. The effectiveness of the learning process depends on the learning planning tools prepared by teachers. These tools refer to the development of the curriculum, such as the development of annual programs, semester programs, podcast programs, broadcasting, and daily programs, enriching and remedial programs, guidance and counseling programs, syllabus development, and preparation of learning plans (Kunandar, 2011).

Effective learning can be defined as learning that successfully achieves students' learning objectives as expected by teachers. The effective learning model includes four main factors: 1) quality of learning, 2) adequate levels of learning, 3) rewards, and 4) time. Meanwhile, the quality of learning refers to the designed activities and the actions taken by students and teachers, including materials or learning experiences (curriculum) and the learning media (Setyosari, 2014).

The effectiveness of a common learning focus is assessed by statistical tests (i.e., different tests) to examine the significance of the effectiveness. This effectiveness can also be assessed by paying attention to the quality of the learning process. Learning processes focus on models, methods, approaches, strategies, tricks, techniques, and media. A study can examine the effectiveness of using one of these aspects. Effective learning is indicated by five aspects: (1) the management of the learning implementation, (2) the communicative process, (3) students' responses, (4) learning activities, and (5) learning outcomes. These indicators are interrelated and mutually supportive. Learning is considered effective if all of the five indicators reach a minimum good category (Joseph, 2018).

As a lesson planner, a teacher is expected to design teaching and learning activities effectively. The design includes formulating goals, selecting materials, choosing methods, and setting evaluations. To create effective and efficient planning, professional teachers must focus on and apply good and correct learning methods for their students. Learning plans are absolutely mastered by professional teachers. 'Moreover, the recent fast-paced information era requires teachers to have anticipation and competence in their profession. Therefore, the learning process can produce graduates who meet the needs of the global community (Nurlaila, 2018).

Teaching is not only delivering learning material but also changing students' attitudes to meet the expected goals. Thus, learning activities must be planned and prepared by recognizing students' surrounding conditions, understanding the characteristics of students, understanding students' learning styles and abilities, and triggering teachers to be professional educators. Meanwhile, the activities of teaching planning include developing a syllabus and compiling a lesson plan. Planning teaching activities in learning activities refer to activities of how educators teach and students learn. The teaching activity is conscious and well-planned. Qasim (2016) argues that a well-planned activity contains three important elements: plans, implementation, and evaluation.

The observation result shows that SMAN 1 Ciwaringin is one of the high schools with qualified biology teachers. Therefore, the teachers' ability to design the learning could improve students' learning outcomes. The description above indicates the importance of examining teachers' pedagogical competencies to design learning and improve students' learning outcomes. This study explored (1) how teachers designed learning and teaching preparation and (2) how teachers evaluated learning techniques. It is expected that this research can become an example or reference for teachers and other prospective teachers to implement classroom learning.

It is expected that teachers' competencies in design learning can improve students' learning outcomes and solve various problems that occur in the learning process. Consequently, students can understand the concept of biology comprehensively, think creatively, and realize the importance of education for their future. Based on the above background, the authors were interested in examining a teacher's competencies in designing lessons to improve learning outcomes class XI students of SMAN 1 (public high school) Ciwaringin.

2. Method

This research employed a descriptive qualitative approach. Sugiyono (2016) defines the qualitative descriptive method as a research method using the postpositivism philosophy to examine the condition of natural objects (as opposed to experiments); in this research, researchers are the key instrument to collect data. The collected data were then triangulated (combined) and analyzed inductively/qualitatively. The results of qualitative research emphasize meaning rather than generalizations. Qualitative descriptive research aims to describe, describe, explain, and answer problems in more detail. Moreover, it investigates individuals, groups, or events as many

as possible. In qualitative research, humans are research instruments, and the results are written in words or statements in accordance with the actual situation.

This study collected the data through interviews and direct surveys at SMAN 1 Ciwaringin. The data were in the form of words and documentations arranged in the form of sentences. Qualitative descriptive research aims to understand the truth by considering the participant's points of view; they were interviewed and observed, gave opinions and thoughts, as well as provided data and perceptions to assess students' learning outcomes. These steps were conducted using a multiple-choice test.

3. Result and Discussion

Teacher's ability to design lessons

This study investigated the teacher's ability to design lessons and improve students' learning outcomes at SMAN 1 Ciwaringin in the even semester of the 2018/2019 school year. Schools' learning plans refer to a process of preparing subject matters and use teaching media, learning approaches, methods, and assessment at a certain period to achieve pre-determined goals.

The word ability is derived from the word capable which means power (able) to do something. Meanwhile, the word ability means competence, skill, and strength (KBBI, 2019). It also means the capacity of an individual to perform various tasks in a job (Judge, 2009). These definitions conclude that ability refers to an individual's capacity or skills to master and use them for various tasks in a job.

This research aimed to investigate how the biology teacher, namely IW (an initial name), designed the learning to improve students' learning outcomes. They had good intellectual abilities, thinking, logical reasons, and problem-solving capacity. Moreover, they always thought about the causes and effects of these problems and carefully attempted to solve them. They also used their perspectives to design and arrange good and appropriate learning tools by considering the students' conditions. They designed the syllabus, lesson plans, annual programs, semester programs, break before final tests, and questions for evaluations.

Besides good intellectual ability, teacher IW also had excellent physical ability to perform tasks and skills that require stamina, such as teaching, learning, attending the class, interacting with students, and inviting students to actively and willingly learn in the classroom and school environment.

Learning planning is designed for learning activities in the classroom; teacher IW must thus follow the learning system determined by the system and applied at SMAN 1 Ciwaringin. One of the systems regulated teachers to plan learning programs following the school curriculum. The results of interviews, observations, and documentation revealed that teacher IWs' learning plans considered several aspects: 1) educational calendar, 2) effective week plans, 3) annual programs, 4) semester programs 5) syllabuses, 6) learning implementation plans, and 7) evaluation techniques.

The biology teacher has taught the subject at SMAN 1 Ciwaringin since 2005 (more than 15 years). Since 2013, SMAN 1 Ciwaringin has applied the 2013 curriculum. Teacher IW composed a similar syllabus to that of other SMAN 1 Ciwaringin teachers. His syllabus is contained in the curriculum document. In compiling the syllabus, he was guided by the 2013 Curriculum (the revised version). His syllabus consists of several components: the competency identity of each subject, basic competencies, indicators, subject matters, sizes, time, and learning resources. He also uses this syllabus as a new formula to design lesson plans with the following results.

Table 1. Teachers' ability in designing lessons from the syllabus aspect

No	Meeting	Teacher's Competencies (%)
1	1	100
2	2	100
3	3	100

Table 1 shows that the syllabus gained a 100% score from the first to the third meeting. This result was obtained from a perfect assessment, namely the average score of 3 indicating very good. Furthermore, the learning aspect in managing effective learning achieved the expected competencies. These results agree with the research by Wahyuhono (2017), who deploys that a syllabus is a compulsory learning tool of teachers. Moreover, it is a direction of goals and guidelines for teachers to conduct the learning. Therefore, when the syllabus does not meet the requirements and aspects, it will bring negative impacts on learning outcomes. Such a condition demands teachers to successfully create a good syllabus. Teacher IW proved that her syllabus was good and in accordance with Permendikbud (Regulation of the Minister of Education and Culture) No. 81 A in 2013.

The interview showed that teacher IW compiled a lesson plan for the even semester of the 2018/2019 academic year. The lesson plan was prepared as a guide in implementing the learning and developed based on the syllabus for each material taught and indicators of student achievement. The results of this activity are revealed through direct observation, as presented in Table 2.

Table 2. Teachers' ability in designing lessons from the aspect of the lesson plan

No	Meeting	Teacher's Competencies (%)
1	1	100
2	2	100
3	3	100

Table 2 shows that teacher IW prepared a lesson plan for the even semester of the 2018/2019 school year. The lesson plan was prepared as a guide to conduct the learning and developed based on the syllabus. The lesson plan gained a 100% score from the first to the third. These scores indicated perfect scores. The lesson plan compiled by teacher IW consisted of several components: identity, competency standards, basic competencies, indicators, learning objectives, expected character values, materials, learning methods, learning steps, learning resources, assessment guidelines, and attachments. This result concludes that the lesson plan compiled by teacher IW is based on the syllabus and Permendikbud (Regulation of the Minister of Education and Culture) No. 81 A in 2013. Moreover, it indicates she has good skills to design learning processes.

This finding is in accordance with research by Bararah (2017), discovering that a teacher must understand the standard format of lesson plans and have good competence to compose the lesson plan and prepare activities. However, he must recognize that changes in the lesson plan frequently occur and probably make the formulation of the lesson plan is incorrect. Hakiim (2012) explains the importance of lesson plans for the learning process: 1) Helping teachers utilize or determine the efficient use of learning material resources and learning time in the class, 2) Reminding teachers to include all good learning factors, 3) Helping teachers anticipate possible problems, think about solutions, overcome obstacles, or avoid things that hinder learning, 4) Helping teachers create a careful and conscientious attitude, 5) Serving as a useful learning resource for the future teaching, and 6) A learning plan strongly helps teachers implement an

effective learning process because compiling a learning plan enables the teacher to find out what is needed and implemented in the learning process in the classroomLearning plans

Based on the knowledge of materials and principles of learning that follows the sequence of learning materials, teacher IW's learning plans were still in the learning process and not completely correct even though she had followed the curriculum. Moreover, she checked the guidelines of the syllabus and lesson plans to compile the learning materials used in classroom learning.

Before entering the classroom, teacher IW prepared a written plan containing operational learning objectives, forms of teaching and learning activities, methods, time, learning aids, and evaluations. In addition, the learning methods must apply a method appropriate for the teaching and learning process; thus, the goals are achieved. The provision of learning motivation and teaching aids helps students get a concrete picture, explain subject matter, attract students' attention, and increase students' enthusiasm for learning activities. The frequently used learning method are discovery learning, discussion, and role-playing methods. Role-playing can make active and passive students active because they are more excited and willing to learn, and the learning material is easily understood.

Teacher IW often used projectors, laptops, laboratory equipment, the surrounding environment, and attractive learning media for students. Moreover, the media had to agree with the material taught; for example, the material of breathing requires practicum because it is more interesting to put into practice. Teacher IW's knowledge of potential development students enabled her to monitor students' learning progress in the teaching and learning process from the beginning to the end of learning. She observed students' activities in the teaching and learning process and held a posttest at the end of the lesson.

The lesson plans made by teacher IW consisted of several steps to conduct activities by students and teachers during the learning process. Teacher IW explained that the sequential learning steps were the initial, core, literary, and final activities. The initial activities included the orientation activities, such as praying, greeting, perceiving, conveying learning objectives to achieve, providing motivation to students, repeating learning material to study, and providing references for students.

The core activities carried out by teacher IW were divided into five activities. 1) conducting stimulation activities through literacy activities, 2) providing problem statements (i.e., questions/identification) to improve thinking skills and providing opportunities to identify questions, and material as many as possible, 3) collecting relevant information on literacy activities to answer questions and collecting, identifying, and collaborating data to divide students into several groups, 4) processing data, verifying data and generalizing activities (drawing conclusions)

The last activity performed by teacher IW was making a resume by considering the teacher's guidance for important points of learning material that appeared in learning activities. Moreover, she gave the students assignments to do at home. Besides using observation documents in learning activities, this research directly observed the learning process for three meetings. the observation results are presented in Table 3.

Table 3. Teachers' ability to design lessons from the aspect of learning implementation

No	Meeting	Teacher's Competencies (%)
1	1	93
2	2	89.5
3	3	93

Table 3 shown that the implementation of learning had reached 93% at the first meeting. However, it decreased to 89.5% at the second meeting. Finally, it rose again by 93% at the third meeting. These findings concluded that in designing learning, teacher IW's aspect of the learning implementation fluctuated in each meeting, and her learning process follows the designed lesson plans.

The development of daily class assessment and evaluation in biology learning assessed positive attitudes, such as responsibility and cohesiveness. Before conducting the evaluation, teacher IW made some preparations. 1) analyzing the basic competencies by making questions, 2) compiling the question grids used as guidelines or references, 3) writing questions on the question sheets by considering the grids, 4) making scoring guidelines and answer keys.

Evaluation tools frequently used in assessing student learning outcomes were multiple - questions, oral tests, and computer games. Meanwhile, the aspects of assessment prioritized by teacher IW were cognitive, affective, and psychomotor assessments in one teaching and learning meeting. Ideally, the cognitive aspect, skills, and affective aspects were assessed during the classroom learning process. The interview results showed that teacher IW's material knowledge and learning principles followed the order of learning materials and considered the lesson plan. However, her learning process was not entirely correct even though she tried to follow the curriculum.

Teacher IW was very competent in designing the lesson and well-prepared before doing the learning process. Moreover, she included the assessment guidelines when preparing the lesson plan. The assessment guidelines consisted of assessment procedures, types of assessment techniques, assessment forms, and assessment criteria. The assessment procedure consisted of an initial assessment, a process of assessment, and a final assessment.

The assessment used by teacher IW was in the forms of multiple choices, short answers, and descriptions for the daily tests and multiple choice questions for the midterm tests. The assessment of daily learning rarely used multiple-choice questions but more frequently used short answers and descriptions. This study directly observed teacher IW's class three times, and the results are presented in the following table.

Table 4. Teachers' ability in designing learning from the aspect of learning evaluation

No	Meeting	Teacher's Competencies (%)
1	1	84
2	2	87
3	3	87

Table 4 explains that the evaluation process had a low percentage of 84% at the first meeting. However, the score of the learning evaluation process increased by 87% at the second and third meetings. These findings concluded the percentage of learning evaluation in each meeting fluctuated because teacher IW did not evaluate the activities at the first meeting. The results show that teacher IW had a good evaluation aspect and could design the learning process. The learning process was evaluated after conducting the learning process and measuring the students' achieved competencies. These stages are in accordance with Selameto (2012), asserting that an assessment necessarily considered several aspects, as follows. 1) Assessment is directed to measure competency achievement, 2) The system used is a continuous assessment system, 3) The assessment uses reference criteria by considering students' ability after participating in the learning process and not determining a person's position against the group's position, 4) The results are analyzed to determine follow-up to improve the next learning process, 5) The assessment system must be adapted to the learning experience taken from the learning process.

Improving student's learning outcomes

Learning designs that have never been applied to material and learning methods will bring different results in the pretest and posttest. Pretest results constitute the results of students who have not received learning from the teacher. Meanwhile, the posttest results refer to results obtained by students when receiving the material and learning from the teacher.

The different improvement of students' learning outcomes refers to the revised bloom taxonomic indicator from C1 to C6 by Andersondan Kratwohl; this indicator was the cognitive domain (Oktaviana, 2018). This study consisted of six indicators: 1) remembering, 2) understanding, 3) applying, 4) analyzing, 5) evaluating, and 6) creating. The average value of students was obtained from the pretest and posttest, as presented in Figure 1.

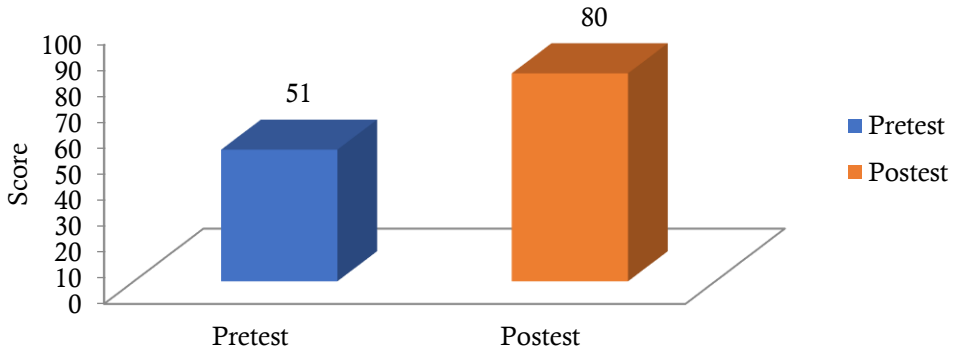

Figure 1. The average pretest-posttest values of students' learning outcomes

Figure 1 shows that the average pretest score of students is low by 51. However, the average score of the post-test increased by 80. The average scores between the pretest and posttest were different because the pretest aimed to test the students' knowledge level of material before teacher IW taught. Meanwhile, the posttest was the final evaluation after teacher IW taught the material. Moreover, the posttest aimed to investigate whether the student understood the material taught. The data above concluded that the students' average scores escalated in the posttest.

Statistical tests were conducted to determine different improvements in students' learning outcomes. The statistical test employed the pretest and posttest data to determine the student' increasing learning outcomes. The results of the prerequisite test are described in Table 5.

Table 5. The prerequisite test results of students' pretest and postest

Test	Normality Test	
	Sig	Information
Pretest	0.234	Normal
Postest	0.006	Abnormal

Table 5 presents the results of the normality test using the pretest and posttest data. The results of the normality test using the pretest data show that the data were normally distributed because the significant value at the pretest was 0.234, or greater than 0.050. Meanwhile, the normality test using the posttest data resulted in a sig. 0.006; in other words, the posttest data were not normally distributed. These findings signify that some data were not normally distributed, a nonparametric test was thus carried out using the Wilcoxon test.

Table 6. The difference between pretest and postest

Data	Different test	Sig.	Information
Pretest-Postest	Wilcoxon Test	0.000	Significantly different

Table 6 shows different test results from the pretest and posttest data in general. The significant values of pretest and posttest were based on the paired sample test result of 0.000. This finding means that the Ho is rejected while the Ha is accepted. To conclude, the student's learning outcomes significantly increased.

Learning outcomes can be interpreted as the maximum results achieved by a student after studying a certain subject. Learning outcomes are not absolutely in the form of values but can come in the forms of changes, reasons, discipline, and skills that lead to positive changes. Table 5 presents the results of the normality test using the pretest and posttest data. The results showed that the data were normally distributed because the significant value in the pretest was 0.234, or greater than 0.050. Meanwhile, the normality test using the posttest data resulted in a sig value Of 0.006; thus, the posttest data were not normally distributed. These findings concluded that some data were not normally distributed because they were not normal. A nonparametric test was conducted using, Table 4.6 shows the different test results between the pretest and posttest data in general. The significance values of the pretest and posttest were based on the results of the paired sample test of 0.000. This finding means that the Ho is rejected while the Ha is accepted. To conclude, students' learning outcomes significantly increased.

A lesson plan is a primary element in learning and one of the pivotal tools for teachers. A lesson plan is included in the competencies compulsorily mastered by teachers, such as pedagogic competencies (Istarani, 2015). Planning and compiling learning is the teacher's mandatory task in the learning process; thus, the expected learning must agree with the implemented learning. Febrina (2016) proposes three aspects to consider when teachers prepare lesson plans. 1) Making the syllabus as a guide to design the lesson plan, 2) Mastering four teacher competencies, especially pedagogic competency to develop and prepare lesson plans, and 3) Developing a learning implementation plan in accordance with the applicable curriculum

This study revealed that teacher IW had very good competency in designing learning. The relationship between teacher ability to design learning and students' improving learning outcomes was shown by the posttest scores of the students' achievement. Meanwhile, teacher IW's ability to design learning was shown by students' active participation during the learning process and all learning tools made by teacher IW. Furthermore, the observations agreed with Permendikbud (Regulation of the Minister of Education and Culture), and the students' learning outcomes significantly increased between pretest and posttest when being evaluated at the beginning and end of learning.

4. Conclusion

This research investigated a teacher's ability to design learning to maximize class XI students' learning outcomes at SMAN 1 Ciwaringin. The result revealed teacher IW had excellent competency in developing the learning tools, processes, and methods to improve students' outcomes. The learning outcomes of class XI students in learning biology increased significantly, as shown by the pretest and posttest scores. The data denoted that teacher IW's ability to design learning could improve students' learning outcomes

References

Bararah, I. (2017). Efektifitas perencanaan pembelajaran dalam pembelajaran pendidikan agama Islam di sekolah. *Jurnal Mudarrisuna: Media Kajian Pendidikan Agama Islam, 7*(1).

Bungalangan, Y. T. (2020). Penerapan metode diskusi terbimbing dalam meningkatkan hasil belajar ips siswa kelas VI SD Negeri 1 Hongoa Kabupaten Konawe. *Jurnal Profesi Keguruan*, *6*(2), 190-197

Febrina, F. (2016). Kompetensi guru dalam perencanaan pembelajaran di SDN 2 Banda Aceh. *Jurnal Ilmiah Mahasiswa Prodi PGSD FKIP Unsyiah, 1*(1), *40-50*

Hakiim, L. (2012). Perencanaan pembelajaran. CV. Wacana Putra.

Ibrahim, M. (2007). Pembelajaran kooperatif. Universitas Negeri Surabaya.

Istarani. (2015). *Ensiklopedia pendidikan Jilid 1.* Media Persada.

Judge. (2009). Core self-Evaluation and work success, *sage journals*. Vol 28

KBBI. (2020). *Kamus Besar Bahasa Indonesia (online)*

Kemendikbud. (2013). *Konsep dan Implementasi Kurikulum 2013.* Kementerian Pendidikan

Nurlaila. (2018). Urgensi perencanaan pembelajaran dalam peningkatan profesionalisme guru. *Jurnal Ilmiah Sustainable*, *1*(1) 93-112

Oktaviana, D., & Prihatin, I. (2018). Analisis hasil belajar siswa pada materi perbandingan berdasarkan ranah kognitif revisi taksonomi bloom. *Buana Matematika: Jurnal Ilmiah Matematika Dan Pendidikan Matematika*, *8*(2), 81-88.

Peraturan Pemerintahan Pendidikan Kebudayaan (Permendikbud) No. 81a Tahun 2013.

Qosim. (2016). Perencanaan pengajaran dalam kegiatan pembelajaan. *Jurnal Diskursus Islam, 4*(3)

Sardiman. (2011). *Interaksi dan Motivasi Belajar-Mengajar*. Rajawali Pers.

Selameto. (2012). penyusunan perangkat pembelajaran bernuansa nilai karakter. *Scholaria, 2*(1)

Setyosari, P. (2014). Menciptakan pembelajaran yang efektif dan berkualitas. *Jurnal Inovasi dan Teknologi Pembelajaran, 1*(1)

Sugiyono*. (2016*). Metode penelitian kuantitatif kualitataif dan kombinasi (mixed. methods). Alfabeta

Sulman. (1986). Those who understand: knowledge growth in teaching. *Educational Researcher*, 15(2).

Sumarmo, U. (2010). berpikir dan disposisi matematik: apa, mengapa, dan bagaimana dikembangkan pada peserta didik. *Artikel pada FPMIPA UPI Bandung*.

Taneo (2010). Bahan Ajar Cetak: Kajian IPS SD. Depdiknas.

Wahyuhono. (2017). Peningkatan kompetensi menyusun silabus melalui supervisi akademik berkelanjutan bagi guru SDN 2 Telawah Kecamatan Karangrayung Kabupaten Grobogan pada semester i tahun pelajaran 2015/2016. *Jurnal Pendidikan Dasar, 6(*2*), 90 – 95*

Yusuf, B. B. (2018). Konsep dan indikator pembelajaran efektif. *Jurnal kajian pembelajaran dan keilmuan, 1*(2).