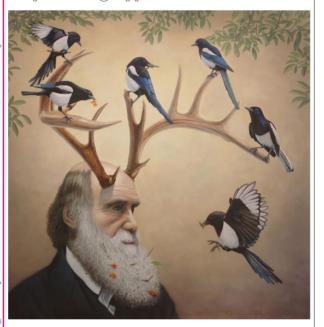# opción

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Development Of Ict- Based Early Childhood Concept Teaching Book To Increase Pedagogic Competence For College Students Of Pgpaud

[1]S. Sumarni, [1]W.D. Andika, [1]F. Utami ,[1]M. Rantina, [2]Y, Sazaki, [3]R.T Astika, [4]B. Rahardja, N, [5]Kurnia, [6]N. Priyanti, [7]Rosita Wondal

[1] PGPAUD, FKIP, Sriwijaya University, Indonesia
[2] ILKOM, Sriwijaya University, Indonesia
[3]DIKDAS, PPS, Jakarta State University, Indonesia
[4] PAUD, FKIP, Mulawarman University, Indonesia
[5]PAUD, FKIP, Bengkulu University, Indonesia
[6] PGPAUD, FKIP, STKIP Panca Sakti, Indonesia
[7] PAUD, FKIP, Chariun University, Indonesia

ABSTRACT
Pedagogic competence should be mastered by candidate for early childhood education teachers/ PAUD, one way by mastering the basic concepts of early childhood education. In fact, based on the needs analysis of the 79 college students of PAUD showed that students need the teaching books of the fundamental concept of ICT-based PAUD with free access, in Indonesian language , discussion per matter, equipped with text and images, references updates, written by authors who are competent in their fields so it is easy to be used by students. Such gap should be immediately resolved, so the research aims to develop teaching book of ICT-based on the basic concepts of PAUD in enhancing the pedagogic competence of college students. The method that Research and Development uses with Dick and Carey design. This research sample is the student of PGPAUD UNSRI as many as 74 students. Implementation step in small group of 23 students, and a large group of 51 students. Based on the data analysis test results, the ICT-based KDPAUD teaching book application that have been developed proved to be valid, practical and effective. The results proved that the application of the ICT-based KD PAUD teaching book that have been developed can increase the pedagogic competence of PGPAUD UNSRI students, so that candidate teachers are able to maximize learning to optimize children's growth in early age.

Keywords: teaching book application; Kdpaud; Pedagogic

Desarrollo del libro de enseñanza de conceptos de la primera infancia basado en las TIC para aumentar la competencia pedagógica para estudiantes universitarios de PGPAUD

RESUMEN

La competencia pedagógica debe ser dominada por el candidato para maestros de educación de la primera infancia / PAUD, de una manera mediante el dominio de los conceptos básicos de la educación de la primera infancia. De hecho, en base al análisis de necesidades de los 79 estudiantes universitarios de PAUD, se demostró que los estudiantes necesitan los libros de enseñanza del concepto fundamental de PAUD basado en las TIC con acceso libre, en idioma indonesio, discusión por materia, equipado con texto e imágenes, referencias actualizaciones, escritas por autores que son competentes en sus campos para que sea fácil de usar por los estudiantes. Tal brecha debe resolverse de inmediato, por lo que la investigación tiene como objetivo desarrollar un libro de enseñanza basado en las TIC sobre los conceptos básicos de PAUD para mejorar la competencia pedagógica de los estudiantes universitarios. El método que utiliza Investigación y Desarrollo con el diseño de Dick y Carey. Esta muestra de investigación es estudiante de PGPAUD UNSRI hasta 74 estudiantes. Paso de implementación en un grupo pequeño de 23 estudiantes y un grupo grande de 51 estudiantes. Basado en los resultados de la prueba de análisis de datos, la aplicación de libro de enseñanza KDPAUD basada en las TIC que se ha desarrollado demostró ser válida, práctica y efectiva. Los resultados demostraron que la aplicación del libro de enseñanza KD PAUD basado en las TIC que se ha desarrollado puede aumentar la competencia pedagógica de los estudiantes de PGPAUD UNSRI, por lo que los profesores candidatos pueden maximizar el aprendizaje para optimizar el crecimiento de los niños en la edad temprana.

Palabras clave: aplicación del libro de enseñanza; Kdpaud; Pedagógico

A. Background

　　Pedagogic Competence is a compulsory competency mastered by a PAUD teacher. Previously a candidate for PAUD teacher which is a PAUD college student must master the basic concepts of early childhood education. Based on the needs analysis of 79 students of PGPAUD, the survey showed that students are really required to have ICT-based hand-

book with free access, in Indonesian Language, discussion per material, equipped with text and images, reference updates, written by the authors who are competent in their field so it is easy to be used by students (Sumarni, et. AL, 2019). With the handbook of KD PAUD based on ICT, it is easier for PAUD teachers candidate to master pedagogic competence.

The fact in the reality shows the low level of pedagogic competence of PGPAUD college students while undergoing pretests with the average score on the courses of KD PAUD is 23 from 100. The gap between hope and fact in the reality raises various problems. Based on the results of identification, the main cause of the problem arises is not yet a teaching book on the basic concepts of early childhood education that students can use in the course of KD PAUD. So students' understanding about KD PAUD is limited. In addition, students also do not get free access in obtaining teaching books, previous teaching books only reviewing one material in a concise way, no quiz as a feedback for students to measure the extent of mastery the material that they obtained. In addition, references to previous teaching books have only been sourced from books, but they do not display the latest research results related to the material discussed.

If this is attributed to the analysis of the previous needs, then the student desperately needs the guide book of KD PAUD-based ICT in line with (Joo, Park, & Shin, 2017) states that students have the hope, satisfaction, and desire to use digital textbooks. Based on a variety of relevant studies, show that the handbook is essential to improve student pedagogic competence (Sánchez Martín, Hirsu, Gonzales, & Alvarez, 2019). The solution of the research problem is the development of the ICT-based PAUD teaching book.

According to (Pandey, 2006) a reading can penetrate the digital world. This means that reading can be a technology. As KD PAUD's teaching book is designed to be based on ICT. So in this research textbook is designed as a computer application that can be easily accessed for free by the millennial. This teaching book application will be uploaded to Playstore with offline version, so students can download an application called "KDPAUD" to be installed and open. Researchers set this application as an offline version application, as students can still open the teaching book application, even if it's offline. There will be no quota warnings out when students use it. So that students freely use it anytime though it is not online.

According to (Sumarni et al., 2019) A teaching book should use a language that readers understand. This is attributed to the analysis of students ' needs, which considers that the ICT-based PAUD teaching

book should be designed with Indonesia Language, thus becoming an easy-to-understand reference source for students in Indonesia. The research from (Sánchez Martín et al., 2019) shows that multimedia learning will certainly use the same learning design in various media. It is just like the Designed teaching book application, still presenting a reading material, but with a different medium. The discussion on KD PAUD on ICT-based PAUD's teaching book application is divided into each material. This is because it makes students to read and find information easily in writing. The presented material is equipped with text and images (Alhumaidan, Lo, & Selby, 2018), so that students can understand easily the concepts described more significantly.
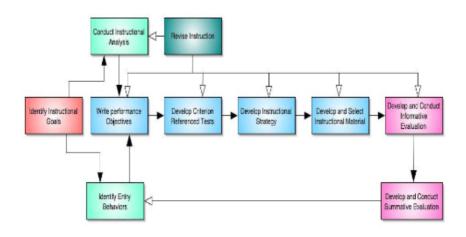
Digital literacy can be a source of reference for readers (Pandey, 2006; Rahmah, 2015; Techataweewan & Prasertsin, 2018; Vélez, Olivencia, & Zuazua, 2017) for that reference used in ICT-based PAUD teaching book, of course, using books and research results on reputable journals and written by competent authors and the background of early childhood education and computer, so it can be used as a referral for readers. Equipped with 10 journals that students can download for free with PDF file format. This is because it makes students easier to access and make concepts in the material as the reference source in writing papers and articles.

So researchers aim to develop the teaching book KD PAUD based ICT in enhancing the pedagogic competence of college students PGPAUD. The development of teaching books of ICT-based PAUD will answer all PG-PAUD college students' need in mastering Pedagogic competence in the course of KD PAUD.

B. Method

 Research Design

The methods used in this research were Research and Development (RnD) (Iglesias Rodríguez, García Riaza, & Sánchez Gómez, 2017). The research model used was Dick and Carey Model. The research procedure begins with (1) determining objectives, (2) Learning Analysis, (3) Student character analysis, (4) Formulating specific learning objectives, (5) Developing assessment instruments, (6) Developing learning strategies.

Dick and Carey Instructional Design Model

Figure 1 Dick & Carey Model

(7) Developing and selecting learning Media, (8) Designing and developing formative evaluation, (9) Revision of learning, (10) Designing and developing summative evaluation. The base of researchers use this model that the procedure is clear, systematic, effective, and efficient. The model was developed with a system approach so easy to be developed.

Participant

The participants in this study were all college students of Early Childhood Education Teacher Program/PGPAUD of Sriwijaya University semester 1 as much as 74 students. Participants were divided into 2 groups, 23 students in small groups and 51 students entered large groups. Both groups used the ICT-based PAUD concept teaching book. The research model used was Dick and Carey Model. Analysis stage, designed, and expanded to completion. Once the product was designed, it tested on 2 experts consisting of PAUD experts and ICT experts. The implementation phase was evaluated which consists of a pretests and a post test that is useful to measure the extent of understanding the basic concept of PAUD that has been developed in the form of the PAUD basic concepts teaching book application. The results of formative evaluation (pretest and posttest) will be analyzed in order to monitor whether there was an increase in the pedagogic competency of PAUD, after using the application of ICT based KD PAUD teaching book.

Data Collection

Data collection was conducted with observation and poll: poll for media validator and material, polls were disseminate to the students in data capture. Data obtained in the form of pretests and post test data. Quantitative data analysis (Schipper, Goei, De Vries, & Van Veen, 2018) is conducted by looking for N-Gain score, while qualitative data analysis was done by reducing, data display, data verification Miles & Huberman (Iglesias Rodríguez et al., 2017).

ICT Based Teaching Book Application

The concept of application ICT-based KD PAUD teaching book that will be developed is a teaching book application that can be access freely from Playstore with the keyword "Kdpaud". This application is offline version It aims to keep students can access the book even though the student is offline though. Here is the front page of the ICT based teaching book application as shown below:
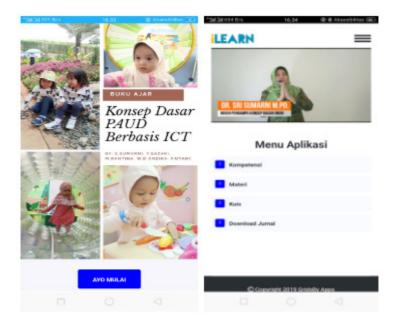

Figure 2. First page and verandas of the ICT-based KD PAUD teaching book application

In the application there are various menus. (1) Tutorial video, this video is 3 minutes long and contains explanations about the manual of the usage of the ICT-based KD PAUD teaching book application which is explained by

the research Chair and lecturer at KD PAUD course Dr. Sri Sumarni, M. Pd. (2) Competence, in which there are 5 pedagogic competencies that students can achieve as learning outcomes on each material. This competency menu can be read manually or automatically. (3) The material, in which there are a list of 5 material choices that students can choose from 1) The concept of the early childhood education, 2) The expert theory about early childhood education, 3) AUD learning Environment, 4) AUD Lesson Model, 5) AUD Assessment . On this material menu there is a button to return to the Menu list page (≡), and the right arrow key (→) and Left (←) to reverse the page as read, the page can also be opened as we open the page in the book. The competency and material menus can be seen in the image below:
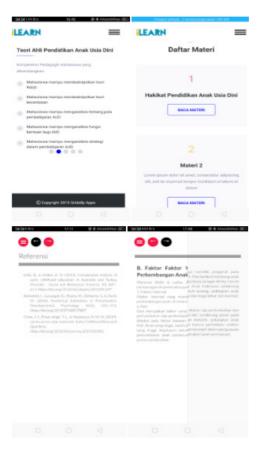
Figure 3. Competency menu and material on teaching book application

4) The quiz, contains a list of quizzes that refer to any existing material. The quiz contains

a list of questions as material reviews. The buttons in this menu are the View Quiz button

and the Back to quiz list button.:

Figure 4. Quiz menu and download journals on the teaching book application

(5) Journal Download Menu, contains 10 journal files with PDF format. In the Journal Files list, there is a Journal Title and a Download Journal button that you can click to download your journal for free. 10 available journals are Scopus indexed journals with purchase access, but in this application researchers give 10 journals for free. This is to increase college student knowledge related to the latest research results about KD PAUD.

C. Results

After the data obtained from the college student formative evaluation, the results showed that there was an increase in student test results in small groups or large groups.

1. Small Group Test:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PretestKK	23.04	23	9.013	1.879
	PosttestKK	63.70	23	15.827	3.300

The number of respondents used was 23 respondents. For small group pre-tests scores acquired average score (mean) of 23.04. Meanwhile, a small group post-test score was obtained an average score (mean) of 63.70. For the default score of deviation in pretests of 9.013 and in Post-test of 15.827. Default score of error mean for pretests of 1.879 and for post- test of 3.300.

Because the average score of pretests 23.04 < Post-test 63.70. Then there was a descriptive difference in the average score of small groups between pretests and Post-test.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PretestKK & PosttestKK	23	.396	.062

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Found the correlation coefficient score of 0.396 with a sig score of 0.062. Sig. 0,062 > Sig 0,05. Then it can be said that there is no relationship between the pretests of small groups with a small group post-test.

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1 PretestKK - PostestKK	-40.652	14.794	3.085	-47.050	-34.255		-13.178	22	.000

Based on that data, it is known that the score of sig. (2-tailed) amounted to 0.000 < 0.05. Then it can be concluded there was an average difference between a small group pretests and a small group post-test (Ha accepted). Mean score paired differences (Mean Pretest – mean post-test) of 40.652. This means that there was an average difference in the significance of students being taught using the ICT-based KD PAUD teaching book. The results of small group trials show the application of teaching book KD PAUD has a good effect on improving pedagogic competence of students. It also proves that the use of ICT-based teaching books developed by effective researchers was used in small scope for PGPAUD UNSRI students. Since the ICT-based PAUD's teaching book application was tested for practicality, researchers need to continue the revision phase to test in large groups. Some of the revisions made include: separate material menu into per material because students are difficult to find information when the menu of material was merged into one reading, so that each material was made per matter.

2. Big Group Test:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PretestKB	45.98	51	12.846	1.799
	PosttestKB	70.20	51	10.675	1.495

The number of respondents used was 51 respondents. For the pretests score a large group of acquired average score (mean) of 45.98. While a large group post-test score was obtained the average score (mean) of 70.20. For the default score of deviation in pretests of 12.846 and in Post-test of 10.675. Default score of error mean for pretests of 1.799 and for post-test of 1.495.

Because the average score of pretests 45.98 < post-test 70.20. Then descriptively there was a difference in the average score of large groups between Pretests and Post-test.

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 PretestKB & PosttestKB	51	.345	.013

Found the correlation coefficient score of 0.345 with a sig score of 0.013. Sig. 0.013 < Sig 0.05. Then it can be said that there is was relation between the pretests of the large group with a large group post-test.
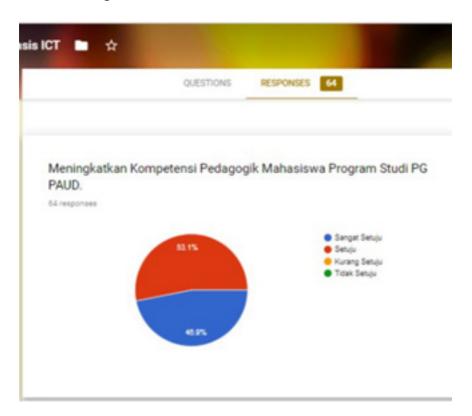
Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 PretestKB - PosttestKB	-24.216	13.578	1.901	-28.035	-20.397	-12.736	50	.000

Based on that data, it is known that the score of SIG. (2-tailed) amounted to 0.000 < 0.05. Then it can be concluded there was an average difference between a large group pretests and a large group post-test (Ha accepted). The score of mean paired differences (mean Pretest – mean Post-test) was 24.216.

This means that there was a difference in the average increase of the significant test results for two student groups taught using the ICT-based KD PAUD teaching book. The results showed that the influence of the teaching book application entitled The ICT-based PAUD teaching book has a positive influence on the improvement of the average group test of students.

It also proved that the use of the ICT-based teaching book that has been developed by an effective research team can be widely used for PGPAUD UNSRI students. In addition, the use of teaching books KD PAUD-based ICT was able to improve the pedagogic competence of students based on the test results obtained.

A questionnaire was collected to review whether practical or not of the ICT-based KD PAUD teaching book if widely used. The questionnaire contains 10 questions aiming to assess whether the ICT-based KD PAUD teaching book has been in line with the students ' needs.

Graph. 1 Student questionnaire related to the benefit of ICT-based KD PAUD teaching book application

The result of the graph showed that 53.1% of the college students who consider highly agreed% agree, 46.9% consider that the ICT-based KD PAUD's teaching book was beneficial in enhancing their pedagogic com-

petence. No students argue or disagree. After searching for student reasons because they really need a learning resource so that they can master the pedagogic competencies learned can be applied in real.

Many studies emphasize the importance of improving pedagogic competence of teachers (Catalano & Catalano, 2015; Garcia, Moizer, Wilkins, & Haddoud, 2019; Mâță & Suciu, 2011; Petrovici, 2014). Pedagogic competence is proper to be mastered by candidate educators of early childhood education because it was beneficial to them in the success of the learning process (Petrovici, 2014) while optimizing the growth of Early childhood children (Cavalheiro, Lamônica, de Vasconsellos Hage, & Maximino, 2019; Felfe & Lalive, 2018). Recent research showed that increasing the pedagogic competence of students will be more effective when conducted in ICT-based (Iglesias Rodríguez et al., 2017; Sumarni et al., 2019). This was because the candidate teachers of early childhood education were the millennial generation who are already extremely familiar with ICT in its daily life (Kaya et al., 2014). So that students can understand and optimize the growth of early childhood children (Sart, 2014).

D. Conclusion

The ICT-based KD PAUD teaching book application is proven to be valid, practical and effective to apply to candidate of PAUD teachers. This teaching book application developed proved to be able to improve the pedagogic competence candidate of PAUD teachers, so that candidate teachers can maximize the learning and optimize the growth of early childhood children. The ICT-based KD PAUD teaching book application does not only provide information regarding the basic concepts of PAUD, but there are quizzes so that students can measure the extent of their understanding of each material. In addition, students can obtain and make the teaching book as a reference in the course of the school of KD PAUD.

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