Development Of Micro Credential Open Online Learning (VINESA) To Improve Indonesian Higher Students' Pedagogical Competence MCOOL Technology Instructional Process

Lamijan Hadi Susarno[1*], Budi Setiawan[2]

[1*]Universitas Negeri Surabaya, lamijansusarno@unesa.ac.id
[2]Universitas Pendidikan Indonesia

ARTICLE INFO	ABSTRACT
This research is motivated by the problem of the low pedagogic competence on basic educational course of higher students in Indonesia; especially in East Java. It has forced colleges and universities, especially in Indonesia, to switch to online teaching and learning (OTL). This research aims to find out, improve, and make sure that all students have the same opportunities to learn and teach well. It belongs to developing Online Learning for Basic Education courses using vi-learning facilities provided by the State University of Surabaya (UNESA) by involving students majoring in Curriculum and Educational Technology at UNESA. It applied the ADDIE development model that consisted of five stages. In addition, this research also conducted field trial tests for students to determine the effectiveness of the product development namely; VINESA. The results of this study showed that online learning in Basic Education courses was feasible to be used for teaching and learning activities for undergraduate students of Educational Technology with test evidence instructional design expert = 90% "very good", individual trials = 90% "very good" and small group trials = 95% "very good." In addition, based on data analysis, the use of online learning in Basic Education courses is proven effective in learning, showed by the significant difference level of learning outcomes ($t = -14.26$, $p < .001$).
	Keywords: *ADDIE model, basic education, online learning platform, virtual learning*

Introduction

The worldwide has changed a lot about how higher education (HE) institutions teach. According to national lockdown rules, students and teachers at all levels and in all fields of study had to switch quickly to online methods of teaching, learning, and grading (Braden, 1996; Lockee, 2021; McCullogh et al., 2022). This sudden end to face-to-face learning was a big challenge to work-life balance and well-being, and it caused a lot of trouble (Gülbahar & Adnan, 2020). Many students and staff felt very alone and cut off from their peers and coworkers with whom they worked and socialized every day before the pandemic. Higher education institutions have to make sure that students can get learning services, which is their right. Along with the development of communication and information technology that is increasingly advanced, the fulfilment of student learning services also requires a touch of technological advances. Unesa is one of the universities that have organized a vi-learn program, virtual learning, where students can participate in online learning. However, not all courses in every major have online lectures.

One way to improve the learning process is that lecturers are required to make learning more innovative, encouraging students to learn optimally in independent study and classroom learning. Educational Technology Program, Faculty of Education, State University of Surabaya is an educational institution that aims to produce competent human resources in the field of Educational Technology. The Basic Education course is a theoretical learning course requiring learning resources that can make students more active and independent. Learning that takes place in the Educational Technology Study Program is directed to facilitate

the development of potential abilities possessed by students into real abilities that can be used especially to solve educational problems and the learning process.

Students may be able to learn what they need to know for classroom tasks with the help of multimedia materials in OTL. In addition, many universities, like the Massachusetts Institute of Technology and Carnegie Mellon University, let people all over the world access their course materials and lecture recordings through the Internet. People are signing up for more and more massive open online courses (MOOC's) that are made and taught by well-known professors and teachers at major universities. The growth of information and communication technologies, especially smart devices, is what makes these movements happen. Innovative practises in higher education require educational scholars to come up with new ideas and theoretical frameworks to explain how new things happen in OTLs (Hill & Cynthia, 1984; Cho et al., 2015). New technologies, activities, and learners have led to the creation of new words, such as Web 2.0, MOOC's, and "digital natives."

The concepts of focused pedagogic discourse, independence and autonomy, transactional distance, and contact have all been the subject of academic research (Arends, 1997; Gunawardena & Mclsaac, 2004). The social presence and sociocultural settings of online learning have captured the attention of academics, who are also fascinated by 3D virtual worlds and cellphones. In spite of the fact that researchers are interested in finding ways to better online higher education, more attention should be paid to developing a comprehensive conceptual framework for online learning and teaching (Sukirman & Setiawan, 2022). "missing" is the conceptualizing, restructuring, and remaking of the teaching and learning transaction," write Cleveland-Innes and Garrison (2012). (p. 223). A large number of higher education institutions has adopted blended and online learning, which makes use of modern technology, but very few have conducted study on OLE paradigms (Fathurrohman, 2014; Basuki & Haryanto, 2016).

Based on the description above, the Basic Education course is one of the courses that have not used the Vi-Learn Unesa online lecture facility. At this time, lecture activities are still conventional face-to-face, using various references and other relevant sources according to the competencies to be achieved. Students' success in each course is a provision to realize their expertise. Understanding conceptual competence in the Basic Education course needs to be considered to achieve the success of learning objectives that are not only on learning outcomes. In other words, online learning is expected to make learning basic education subjects easier and more effective (Nasution, 1992).

Recent studies have concentrated, albeit not solely, on the advantages and disadvantages of online education encountered by college students during the COVID-19 epidemic. Among these are the quality of the student experience and the efficacy of various online pedagogical approaches. For instance, Khalil et al. (2020) identified a number of beneficial student experiences that resulted from the transition to online learning, one of which was an improvement in academic performance. Another advantage that may be attributed to the swift transition to online education is that it has helped students to save money on transport costs and/or travel time to and from college, which has freed up more time for students to devote to independent study (Hung, 2012; Shim & Lee, 2020; Tibana-Herrera'et al., 2018; Zhang et al., 2022).

Methodology

Research Goal
The purpose of this study is to determine, enhance, and make certain that all students are provided with equal opportunity to learn and teach effectively through online learning platform media in term of Learning Management System (LMS). It is anticipated that the media for the online learning platform that was built will make it simpler for students to take part in activities related to blended learning by online asynchronous practice in a post-pandemic context.

Research Design
The ADDIE (Analysis, Design, Develop, Implement, and Evaluate) methodology was employed throughout the process of designing this module as the development model. This model was selected because the ADDIE model is frequently used to describe a methodical strategy for the development of educational program (Dick et al., 2001; Dick et al., 2009). The visualization of the ADDIE model is as follows;

Figure. 1. Procedural Stages of ADDIE Model

Sample and Data Collection
The participants in this research were undergraduates at Universitas Negeri Surabaya (also known as State University of Surabaya) who were in their second semester of pursuing a degree in the educational technology study program having 90 students in the class. There were a total of 52 male students and 38 female students among the group of students. The average age of a member of this group is somewhere between 16 and 19 years old. The typical student comes from a family that falls into the lower middle class in terms of economic capability, when evaluated from the perspective of the parents of the student.

Instruments and Data Analysis Techniques
In this data collection instrument, we use questionnaires and tests. The questionnaire data analysis uses the Guttman scale technique with a firm answer, namely "yes-no", with the decomposition scale, as follows (Sugiyono, 2010):
Score 1 = for the answer "yes."
Score 0 = for the answer "no".
It is calculated using the formula;

$$P = \frac{Total\ answer\ score}{number\ of\ questions\ \times\ highest\ score\ \times\ n} \times 100\%$$

Figure. 2. The Analysis Technique Formula
Notes:
P   = Percentage
n   = Number of Respondents

To give meaning to the percentage number, the formula's calculation results are related to determining the level of success of online learning (Sudjana & Rivai, 2001; Sudjana & Ibrahim, 2009). The eligibility level of the revision criteria is as follows:

Table 1. Eligibility Level of Product Revision Criteria

Percentage	Criteria	Note
81% - 100%	Very Good	No revision
61% - 80%	Good	No revision
41% - 60%	Fair	Revision
21% - 40%	Poor	Revision
0% - 20%	Very Poor	Revision

$$t = \frac{x1 - x2}{\sqrt{\frac{s^2}{n1} + \frac{s^2}{n2}}}$$

Figure. 3. Data Analysis Technique

While the data analysis technique uses the t-test formula as follows:

Notes:
t   = Sought coefficient
x1 = The average value of the control group
x2 = The average value of the experimental group
n   = Number of subjects
s^2 = Estimated variance
a. Test significance:
1) If t < 0.05, H0 is rejected, which suggests an independent variable affects the dependent variable.
2) If t > 0.05, H0 is accepted, implying no significant effect between independent and dependent variables.

Findings / Results

When it comes to guiding the process of instructional design and development, the area of instructional design provides practitioners with a diverse selection of models from which to pick. Some models, such as the one developed by Dick and Carey (Dick, Carey, and Carey, 2001) or the three-phase design model, are based on a sequential and prescriptive series of processes that define the instructional design process from beginning to end. 70 Distributed Learning This process can be seen as a progression. Other models, such as the recursive reflective design and development (R2D2) model (Bonk and Zhang, 2006) and the four component instructional design (4C/ID) model (Van Merrie nboer, Clark, and De Croock, 2002), place an emphasis on the identification, analysis, and subsequent dissection of learning tasks into simpler subtasks

that can then be addressed with instructional materials. These models were developed by Bonk and Zhang. Still others, such as the model proposed by Gagne (Gagne, 1985; Molenda, 2003), are primarily concerned with the levels of interest and motivation displayed by the students. The details stages of ADDIE model implementation for product/ media development are presented below;

Analysis Stage

During the analysis stage of the process, the primary focus is on getting an understanding of the instructional goals as well as the audience that will be receiving the instruction. This entails making an effort to obtain an understanding of the existing skill levels and experiences that the learners may bring to the session in question. In addition to this, the group needs to determine precisely what it is that students should be able to achieve once the learning process has been completed. Below is the procedural analysis as the initial step in developing Vinesa online learning platform media.
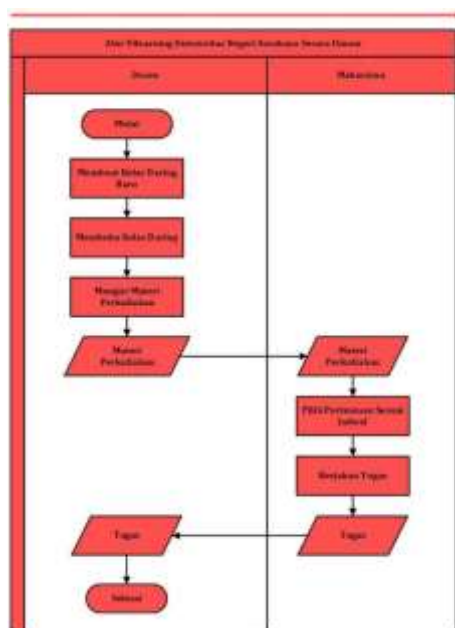

Figure. 4. Stages of Initial Needs Analysis for Vinesa online learning platform media

This initial stage is the first step for a preliminary study. In this stage, a needs analysis is carried out to find out the root of the problem by conducting interviews. Furthermore, based on the results of interviews that have been carried out, several problems were found, that is, during the pandemic. Covid-19, according to a circular from the Ministry of Education and Culture, the governor of East Java, and the Chancellor of UNESA (Surabaya State University), stated that learning was carried out online to minimize the occurrence of massive Covid-19 transmission, especially in educational institutions. An online learning model is needed that can be accessed by students and facilitates interaction between lecturers and students, students and students and students with learning resources. Based on the problems faced, online learning is needed in the Basics Education course for undergraduate students of Educational Technology, Faculty of Education, State University of Surabaya during and post pandemic of Covid-19.

Design Stage

The second stage design. This stage is also known as the planning stage. The planning in question is the development of online learning by using synchronous and asynchronous interactions through LMS Vinesa. Asynchronous can be in the form of discussion forums, collection of assignments, quizzes, sharing of materials, media and learning resources. While synchronous is through eye contact in real-time. The outline of the material that will be included in this lesson is as follows;

Table 2. Outline of the Materials

No	Outline of the Materials to be Presented
1	Basic Concepts of Education
2	Human Nature and Its Development
3	The Nature of Education
4	Education as a System
5	National Education System
6	Educational Foundation
7	The Concept of Teacher as a Profession
8	Educational Problems
9	Educational Innovation in Indonesia
10	Character Building

The majority of the work will be completed during the design phase. During this phase, learning goals and objectives are formulated and drafted (but not the last version one), learning activities are conceived, and media selection is determined and learning assessments that are based on the objectives are being drafted in a preliminary way. Here is the first design of Vinesa online learning platform media as the continuation of analysis step.

Figure. 5. Vinesa Online Learning Platform Media Dashboard Feature

At this stage in the process, teaching teams should be asking themselves questions that focus mostly on the availability of resources and how the team feels those resources ought to be distributed. These questions include the following:

- What different kinds of media will be used in the creation of the instructional materials? Will the team have access to a wide variety of different media resources?
- Will the material have an interactive component? Are the members of the team equipped with the necessary skills to develop interactive online learning objects?
- How much time do you anticipate being needed to finish the classes that have been planned?
- How much time does the group have available to design the materials they will use?
- What methods will the group use to check whether or not the students have reached the goals for their learning?
- What kind of user interface is the group planning to design?
- Will the group make use of the Vinesa Online Learning Platform Media, or will the content be available externally, say through a web page?

Additionally, the group came to the conclusion that each of the online courses should adhere to a predetermined design template. This would guarantee a degree of continuity and make it easier for students to navigate the various types of content.

Development Stage
The third stage is the production stage. It is the process of making a blueprint, aka design, a reality. This means that everything that is needed or will support the learning process must be prepared at this stage. The goal of the ADDIE model's development phase is to provide the opportunity for the instruction design team to put the plans that were developed during the design phase into action. During this phase, the team focuses on finalizing the learning goals and objectives, drafting the actual instructional materials, and constructing the online learning objects and assessments. At this point, the instructional team may wish to address any concerns that are related to the amount of time that has been allotted for the creation of the materials. The team started the process of authoring the instructional content by using the module template that they had built after they had finished collecting the necessary learning objects and media. Because of the extensive planning that went into this content throughout the design phase, everything went off without a hitch. It was requested of the members of the Instruction team that they compose a module overview that would begin with a query directed at the intended audience regarding the research project that they were about to start. For instance, in the description of the Topic choosing module, the first sentence of the paragraph asks, "Would you believe that the selection of research topic is probably the most important step in the completion

of a successful research assignment?" The purpose of this question is to quietly attract the attention of the students by conveying the message that the successful completion of their project is directly correlated to the cautious topic selection that they make.

Figure. 6. Vinesa Online Learning Platform Media Menu

Figure. 7. Vinesa Online Learning Platform Media Academic System Menu

When information is presented in the form of a question, the natural reaction from readers is to attempt to mentally answer the question, which pulls learners in a little bit deeper. They may then decide to continue reading in order to find out the logic behind the assumption that picking a topic is the most crucial phase in the process. The objective of the overview is to provide, in as few phrases as possible, a basic synopsis of what the module will cover and the reasons why the content that will be covered in the module will be relevant to learners as they complete their research tasks. The process stages are individual trials with three students as test subjects and a score of 90% in the "very good" category. Small group trials with six students got an average score of 95% in the "very good" category.

Implementation Stage
The implementation of online learning involves approximately 90 parallel class students that are class A and class B of the Education Technology Study Program who are taking basic education courses in the odd semester of 2020/2021. The lecturer in this course is Dr. Lamijan Hadi Susarno, M.Pd and Dr. Andi

Kristanto, M.Pd. Until this report was made, online learning for basic education courses has been going on for three weeks using synchronous and asynchronous interactions developed through Vinesa. The screenshot of online learning in vinesa is shown in the image below;
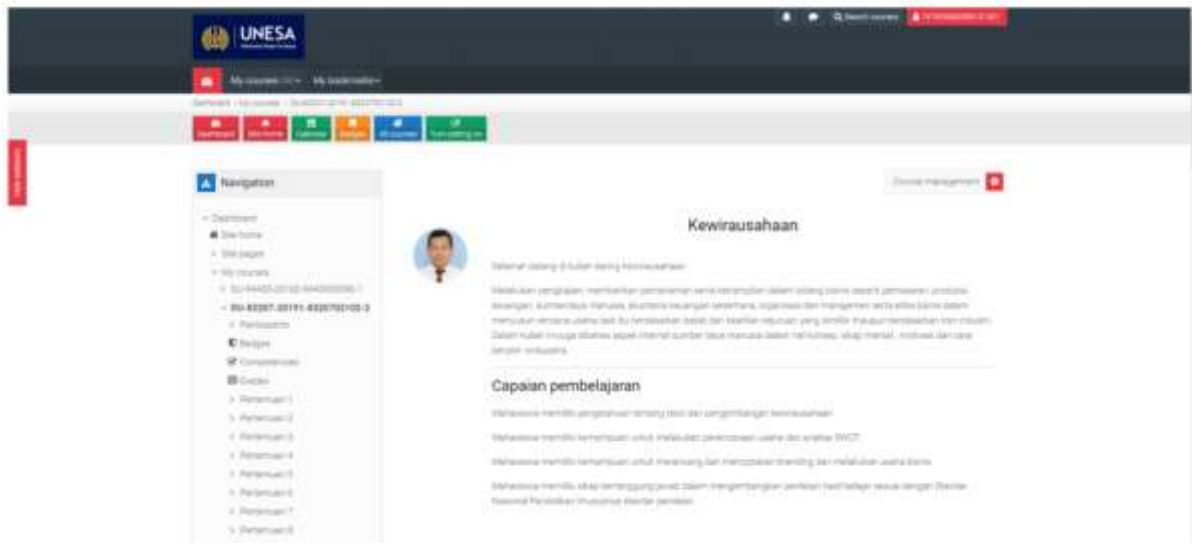

Figure. 8. Application of Basic Education Online Course Teaching Materials in Vinesa

The study team may be able to better grasp the advantages and problems of the system, as well as gather suggestions based on the learners' perspectives, by going through the implementation phase and the evaluation phase. In order to conduct an analysis of the system, this study gathered quantitative and qualitative data. The first one was an analysis of learning performance and consisted of a prior knowledge test as well as an achievement test; the second one was a questionnaire with open-ended questions. The prior-knowledge test and the achievement test were the same, and the analysis phase extended the prior-knowledge test.

Evaluation Stage
The ADDIE paradigm concludes with an evaluation stage as its final step. Evaluations, both formative and summative, are typically included at this step of the process. The instructional materials themselves, as well as how well they are aiding the learning process, are the focus of a formative evaluation. Formative evaluation is carried out in large part through feedback provided by learners and instructors. However, it can also be collected from usage reports generated by the Vinesa online learning platform media or from large-scale observations of student performance on criterion-referenced quizzes. In the latter scenario, recurring patterns of widespread failure to select correct answers on quizzes can indicate difficulties with either the quiz itself or the instructional material being used. Formative evaluation is frequently ongoing and provides feedback that is incorporated into the design process to create a cycle of content change that is cyclical and recursive.
The fifth stage is evaluation, and this is the last stage. This stage is carried out after online learning is given to students for testing. The developer gives pupils pre- and post-tests to measure their abilities. For the purpose of this investigation, we used the paired t-test functionality found in IBM SPSS Statistics 20 programme. According to the findings of the paired t-test that were presented in table 3, it was determined that there was a significant level of difference in terms of learning outcomes (t = -14.26, p <.001). It can be stated that Vinesa Online Learning Platform Media on basic education courses for Educational Technology undergraduates students provides better learning outcomes.

Table 3. Results of the Paired t-test of Learning Outcomes.

Variable	Pretest		Posttest		t
	Mean	SD	Mean	SD	
Learning outcomes	3.06	1.00	4.35	0.87	—14.26***

***p < .001.

Discussion

Instruction in higher education has been characterized by elements including online and blended learning for nearly twenty years (Bates & Bates, 2007; Singh & Thurman, 2019). The actual implementation and adoption of these forms of teaching and learning in universities has been inconsistent, resulting in large degrees of heterogeneity in the educational experiences of students throughout a variety of institutions, fields, and even programs. However, despite the fact that colleges have always offered these modes of instruction and learning, there has been a lack of consistency in both their actual execution and adoption (Joyce & Marsha, 2008; Joyce et al., 2009; Bernard et al., 2014). It is necessary to investigate a wide range of factors related to the adoption and use of online teaching by university teachers in order to assist institutions in better supporting teaching and learning in online spaces, as well as to guarantee that all students have equal access to high quality teaching and learning. This is essential in order to guarantee that all students have the same opportunities to learn from and be taught by professionals of the highest caliber (Stokes, 2002; Kebritchi et al., 2017; Arifin & Setiawan, 2022).

The COVID-19 epidemic and the subsequent implementation of social distancing rules resulted in a rapid transition to OTL (Online Teaching and Learning) for the majority of higher education institutions around the world between March and April of 2020, regardless of whether or not teachers were prepared for the change (UNESCO IESALC, 2020). Because of the sudden change in the format of all instruction, there is a once-in-a-lifetime chance to investigate the degree to which instructors believed they were ready for OTL (Amri & Ahmadi, 2010; Brooks & Grajek, 2020). It is of the utmost importance to acknowledge the multifaceted nature of the perspectives held by higher education teachers regarding their level of readiness for OTL (Martin et al., 2019). This shift signified substantial changes in the way that teaching is practised, particularly in light of the quick transition to training that is delivered entirely online. These alterations in practise, or the desire to engage in change at any level, are the outcome of a complex structure consisting of the influences exerted by individuals, institutions, and cultures (Juwah., 2006; Smalldino, 2011; Kukulska-Hulme, 2012).

It is essential to investigate the connections that exist between these components in order to acquire a deeper comprehension of the preparations that instructors make for OTL (Hung, 2016). In addition, these factors may have a unique impact on particular educators in a variety of ways. Teachers in higher education are not a homogenous group; the multiple crucial relationships that may have an impact on one group may have a dramatically different effect on another group, given the wide variety of backgrounds, OTL experiences, and academic fields that teachers come from. It is essential, in order to provide appropriate support, to have an understanding of the reasons behind why instructors accept or do not adopt new OTL techniques (Boaler, 1997; Faramarz, 2012; Bruggeman et al., 2020).

Institutional support for OTL teachers in higher education was stressed (Mudlofar, 2012; Naylor & Nyanjom, 2020). Several studies have linked online teaching to technological and academic assistance (Bao, 2020; Rapanta et al., 2020). A unifying target of incorporating online- digital technology into instructional process is able to push them for innovation, whereas less of organizational values may demotivate teachers and hamper progress (Riyanto, 2007; Tondeur et al., 2019; Arikunto, 2005; Arikunto, 2013).

As a consequence of the COVID-19 pandemic, the movement to OTL was hastened. This was done while taking into account a wide range of important institutional support issues, such as encouraging lectures to be more familiar and frequently to apply online content and media for facilitating and supporting their students completing their learning goals and also could be supported in their efforts to learn online, and so on. However, instructors in higher education require additional assistance in order to plan, carry out, and maintain online teaching programs (Bolliger et al., 2019). Because of this, it is extremely important to study both the instructors' appraisals of their own knowledge and skills, as well as their thoughts regarding the level of preparation provided by their school. In this study, we looked at teachers' perceptions of institutional support for OTL in general and specifically during the COVID-19 outbreak (Seels, 1994; Munoz Carril et al., 2013; Rahman & Sofan, 2013; Mustaji, 2017). (Seels, 1994; Munoz Carril et al., 2013; Rahman & Sofan, 2013; Mustaji, 2017)

The rapid adoption of online learning meant that schools frequently required additional preparation time to give digital material, technical infrastructure, and the crucial help in online and blended learning (OTL) (Little et al., 2010; Clark & Mayer, 2010; Bao, 2020). Evaluation from teachers show the quality of OTL in some aspects covering; target, management, content/ material in academic to support the success of OTL in the public [Cause and effect] [OTL] (Heinich & Molenda, 1985; Borg et al., 2003; Majid., 2007; Jannuszewsky & Molenda., 2008).

This development research is field research that applies online learning for Basic Education courses for undergraduate students of Educational Technology. Based on the results of the development research data discussion, it is obtained suggestions that are expected to provide research benefits, including utilization suggestions where the use of online learning. It can be expanded again in terms of material, namely the development of online learning in various courses taught by other lecturers, in order to be able to reach other students remotely and in a short time, and dissemination suggestions (spreading). The development of online learning for learning design courses is expected to be developed and used by other majors. However, it is

necessary to identify students, the campus environment and others to reach the maximum in its development.

Conclusion

From the results of research using the ADDIE development model procedure, the research "Development of Online Learning for Basic Education Courses for Undergraduate Students of Educational Technology" produces conclusions according to the data obtained as follows:

Media Eligibility
An expert on learning design by material expert, namely Dr. Fajar Arianto, has tested the development of online learning for Basic Education courses for undergraduate students of Educational Technology, M.Pd gets a percentage of 90%, which is included in the "very good" category. Furthermore, in the individual trial, the percentage was 90% with the "very good" category, then in the small group trial, it was 95% with the "very good" category. Based on the results of the data analysis, online learning for the Basic Education course is suitable for teaching and learning activities for undergraduate students of Educational Technology.

Media Effectiveness
Online learning for Basic Education courses is beneficial, according to data. This is shown by the results of the paired t-test showed that learning outcomes achieved a significant difference level ($t = -14.26$, $p < .001$). Online learning for basic education courses for Educational Technology undergraduates in the experimental class increases learning results.

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