



Implementation of Learning Media Used by Students in Rural Areas: A Mixed-Method Study

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Abstract: Indonesia is a developing country that cannot be separated from areas far behind regarding access to technology. Thus, community-based education is important to accommodate the lack of access to technology. This research aims to analyze the distance learning model that Universitas Terbuka has implemented to improve students' learning outcomes. This research uses mixed methods. This research involved 75 Universitas Terbuka students. The results of this study provide an overview related to the learning model used and the influence of the learning model on student learning outcomes. In addition, the results of this study show that students who take online classes and use flipped classroom learning media have higher t-test scores than students who take online classes and YouTube video learning media. This study concludes that community-based education is not only limited to empowerment but also advancing the quality of learning through technology-based innovation.

Keywords: community-based education; learning media; rural area; Universitas Terbuka

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INTRODUCTION

Community-based education is a model where everything related to education involves more of the community than the state (government) (Anlimachie et al., 2025; Ampah-Mensah et al., 2024; Lestari et al., 2020). The community has great authority and responsibility in its implementation. In the UK, community-based education has challenged the minorities organizing it (Steenwegen & Meijers, 2024). This is because each country has different problems related to the role of community-based education (Kaur, 2023; Zhang & Perkins, 2023). Community-based education model is an offer to mainstream state-based education. Community-based education has existed since Indonesia's independence, even before independence (Zulkarnain & Zubaedi, 2021). However, conceptually, the community-based education model had yet to be formulated in a standard way.

Community-based education is developed and implemented by the community and for the benefit of the community itself. Through community-based educational institutions, the community seeks to improve their lives continuously through empowerment using education and training (Westoby & Lathouras, 2024). From here, then developed models or forms of community-based education. Some examples of community-based educational institutions are TKA/TPA, community-run course institutions, Islamic boarding schools, and the like. In community-based education, it is the community that becomes the master or owner of their own home. The other party, in this case, the government, can only be a partner or partner whose function is to facilitate, fund, or assist all activities related to community-based education without any element of imposing interests (Yue, 2024). Community-based education is a mechanism that provides opportunities for everyone in community to enrich science and technology through lifelong learning (Kanuka, 2006). Community-based education is a manifestation of the democratization of education through the expansion of educational services for the benefit of the community (Díaz-Gibson et al., 2017). Communities can develop and empower themselves through the education they develop. Community-based education can only exist and run well in certain aspects when a democratic atmosphere of life has grown and developed well. The community is aware of the importance of empowerment. In ownership, community-based education is considered community-based if everything related to it is in the hands of the community, such as planning to implementation.

On the other hand, if the government determines all education, it is called state-based education, or if the school determines everything, it is called school-based education (He et al., 2015; Mutambara & Bayaga, 2021; Shouse, 2008; Walsh et al., 2018). Community-based education is considered more oriented to the involvement or role of the community in the education it manages. Community-based education can accommodate various learning theories to relate education to the context of learning theory. The theory of

multiple intelligences, social learning, and the like can be applied in community-based education. Matters related to community-based education in the context of learning are as follows: 1) The learning process occurs spontaneously and naturally, 2) Learning by doing and experience-based learning, 3) Involving mental and physical activity, 4) Competence-based learning, 5) Problem solving, 6) Takes place in active interaction in the environment, 7) Self-actualization, 8) Fun and intellectual, and 9) Productive (Baldridge et al., 2017). These things are not absolute, and they all exist in community-based education developed by the community because people have different tendencies and need to empower themselves.

Community-based education usually leads to community issues such as career training, concern for the environment, primary education, religious education, handling health problems, and so on for the sake of realizing a superior community in all fields (Bhuwania et al., 2024; Ahmad et al., 2024; Choulagai, 2019; Setiawan, 2017). Community-based education empowers the community with all its potential and capabilities, and this empowerment and education take place continuously and for life (long life education). According to Aspfors and Bondas (2013), the school-community relationship aims to 1) Advance the quality of learning and child growth, 2) Strengthen goals and improve the quality of life and community livelihoods, 3) Encourage the community to establish relationships with schools. The implications of community-based education for the community itself are 1) the community is empowered, 2) the community is allowed to develop abilities, and 3) the community is given the freedom to design, plan, finance, manage, and evaluate themselves (Salazar et al., 2010). Community-based educational institutions in the formal and non-formal education channels can obtain technical assistance, subsidized funds, and other resources for procedures regarding technical assistance, subsidized funds, and other resources. Through community-based education, the community can develop its potential and abilities for change. Community-based education becomes a model of community empowerment that accommodates the needs and interests of the community. The Universitas Terbuka is a public university with an open, remote higher education system. The Universitas Terbuka was established based on Presidential Decree Number 41 of 1984. When it was inaugurated by the President of the Republic of Indonesia on 04 September 1984, the Universitas Terbuka had the mandate: (1) accommodate prospective students who do not pass the new student admission system (SIPENMARU), (2) continue teacher education projects through distance learning, and (3) provide wider opportunities for people who are already working to continue their education at the higher education level. The Universitas Terbuka was initially established to improve Indonesia's human resources, especially in providing access to higher education to the community, to increase Indonesia's human development index.

Generally, community-based education prioritizes health education (Ahmad et al., 2024; Ko et al., 2024; Choulagai, 2019). Thus, community-based education through higher education and focusing on developing community potential is minimal. This research seeks to continue Ampah-Mesah et al. (2024), where innovative ways are needed to prepare community-based education. Therefore, this study aims to identify the learning model that Universitas Terbuka has implemented and analyze its success rate. It also aims to identify aspects that become community problems in accessing education, analyze the development of learning models based on their needs and problems faced by the community in accessing education, and analyze the effectiveness of the proposed new learning model to improve access to education at the Universitas Terbuka. This research can be used as a reference for the updated system used at other universities that also use distance learning systems. In addition, this study discusses community-based education. The purpose of community-based education is community empowerment in a better direction for realizing a community that excels in all fields. Community-based education empowers the community with all its potential and capabilities. This empowerment and education occur continuously and for life (long life education).

METHODS

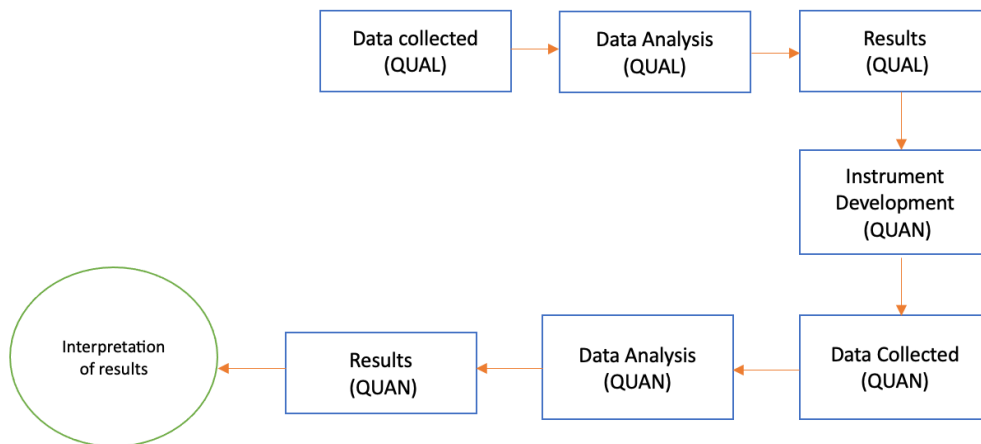
This research was conducted in Banten from March to December 2021. A mixed-method approach (qualitative-quantitative) was used for a more accurate need assessment explanation (Creswell, 2017). Furthermore, a literature review from previous studies was used to obtain the best model. Qualitative instruments are used in interviews and quantitative forms. The questionnaires are described as follows: Instrument number 1 is a qualitative instrument in the form of interviews: (1) There are two instruments; the first instrument is addressed to Universitas Terbuka lecturers, and the second instrument is addressed to Universitas Terbuka staff, and (2) Question: "How is the learning model that has been implemented in learning at the Universitas Terbuka."

Table 1. Interview Instruments 1 for UT Lecturers

Focus	Sub focus	Description
Materials	Relevance of the learning model with the material	Telling the lecturer's perception about the relevance of the current learning model with the material
Time	The relevance of the time needed in filling out the material	The lecturer explains whether the time required in the learning model is sufficient to deliver the material
	Effectiveness of time	The lecturer explains whether the time used in the learning model effectively delivers the material.
Access	Ease of accessing learning	Lecturers describe how easy it is to access learning with the model used.
Constraints	In the learning process	The lecturer explains the obstacles related to the learning process using the current Universitas Terbuka model.

Instrument number 2 is a quantitative instrument in the form of a questionnaire: (1) There are two questionnaires; the first questionnaire is addressed to Universitas Terbuka lecturers and the second questionnaire is addressed to Universitas Terbuka staff, and (2) Question: "How is the success rate of the learning model that the Universitas Terbuka has carried out." The validity of the quantitative instrument items in a questionnaire for lecturers and students was tested using the Pearson Product Moment because the scoring was polytomy. Based on the calculations of the two instruments, out of 9 items, there are no invalid items. Based on the results of the calculation of the reliability coefficient of quantitative instruments in the form of questionnaires for lecturers and students, respectively 0.718 and 0.765, then interpreted $(0.718) 2 \times 100\% = 51.5\%$ and $(0.765) 2 \times 100\% = 58.5\%$, meaning 51.5% of lecturer respondents and 58.5% of student respondents stated that quantitative instruments in the form of questionnaires for lecturers could be reliable.

Furthermore, experimental research was conducted on the Group Within Treatment design. A different test was performed using the Group Within Treatment (GWT) one-way analysis of variance followed by a t-test. This GWT analysis was used to determine the most appropriate learning media to support the distance learning model at the Universitas Terbuka, with a sample size of 75 students divided into three groups. There are three groups used in this study: students who take online classes + flipped classroom learning media (A1), students who take online classes + YouTube video learning media (A2), and students who take online classes + lectures in tutorial activities (A3). Of the three classes, there is one control class: students who take online classes and lectures in tutorial activities, and other groups are used as treatment classes. The dependent variable in this calculation is student learning outcomes in the learning evaluation course (Y). In this study, the three data groups are assumed to come from normal populations. Figure 1 is an overview of the research flowchart.

**Figure 1.** The research flowchart

RESULT AND DISCUSSION

The results of the qualitative data analysis are that the lecturer respondents stated that the current learning model is quite relevant to the material being taught to students. However, in terms of time, if it can be developed again, a learning model that can make time as effective as possible and more organized so that it begins and ends. Classes can be carried out according to a predetermined schedule. In addition, regarding access, what is done in learning today also depends on signals. Most of them use Gmeet/zoom to provide material, so many rural students whose connections could be better are disrupted in their learning activities. It differs from the Universitas Terbuka staff interviewed, who stated that the current learning model is quite

reasonable compared to the previous. In this case, some students still complain if lecturers start lectures at night (not according to schedule). Meanwhile, the operation of the current learning model is relatively easy. Figure 2 presents the result of quantitative data analysis of lecturers in terms of per dimension.

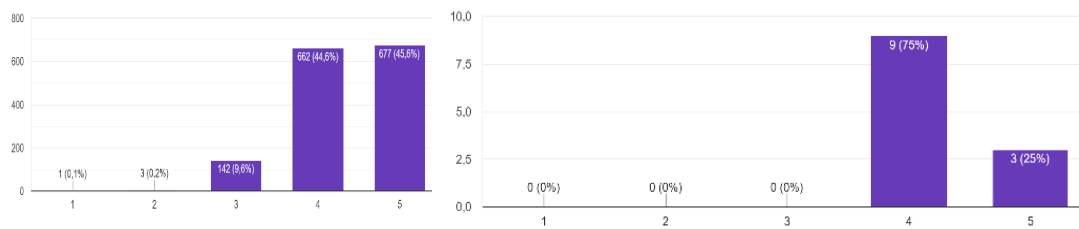


Figure 2. The relevance of the material with the learning model (Left=Student, Right=Lecturer)

The relevance of the material with the learning model stated by the lecturers and students is classified as being in the poor category. In addition, 44.5% of students consider the attractiveness of the material in the current learning model interesting. When identified more deeply, the regularity of the material in the current learning model is in the medium category based on the results of the lecturer's assessment. However, it differs from the results stated by students, where 44% of the material in the learning model still requires regularity. Another problem is that 41.3% of students still struggle to access the current learning model. Lecturers also experience this condition. The relevance of the material with the learning model stated by the lecturers and students is classified as being in the poor category. Lecturers and students stated that the completeness of the material in the current learning model still needs to be improved. Lecturers and students still need more material interest in the current learning model. The lecturer stated that the regularity of the material in the current learning model was in the moderate to excellent category, but it was different from the results stated by the students. The student stated that the material needed to be more regular in the current learning model. According to lecturers and students, the quality of the material in the current learning model is in the good enough category. Lecturers and students still need timeliness between delivering material and using the current learning model. Lecturers and students state that the effectiveness of time using the current learning model still needs to be improved. Lecturers and students stated that accessing the current learning model was still tricky. The quality of access assessed by lecturers and students still needs to be considered poor. The research findings show that developing a learning model is not only a tool for innovation but must also adjust to students' learning characteristics (Kustandi et al., 2020). Thus, the needs analysis process is important in developing learning models. Moreover, Universitas Terbuka has a much larger number of students than universities. This is because the learning model offered can reach various regions throughout Indonesia (Jovanka et al., 2023).

According to lecturers and students, the current learning model is quite good regarding material quality. Lecturers consider the regularity of the material in the current learning model quite good, except for students who still think it could be better. Both in terms of relevance and completeness, the attractiveness of the material in the learning model still needs to be considered better for lecturers and students, including in terms of time and access are still in the wrong category. The current condition of the learning model is already quite good. However, in some respects, such as the completeness and attractiveness of the material, time effectiveness, and ease of access, it still needs to be upgraded again. Considering that most of the Universitas Terbuka students in rural areas are over 40 years old, it is difficult for students to complete secondary lecture materials on their own. Of course, it will not be exciting if the material is unattractive. Therefore, the completeness and attractiveness of the material must be considered. In addition, Universitas Terbuka students who live in rural areas where the signal is complicated to obtain may have to go to the city first to get a good signal. There is no exception for rural students who also work, for example, as farmers, traders, plantations, and the like. The time to attend lectures is divided by working time. To overcome these existing problems, we propose a flipped classroom to support the current online learning model. Figure 3 presents the steps from the recommended flipped classroom.

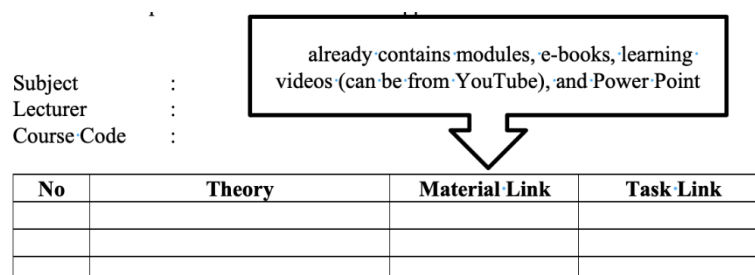


Figure 3. Flipped Classroom example

Steps in flip classroom on mobile phone: (1) Lecturers who teach courses are given a sheet in the form of Word/pdf (as in the picture below); (2) Lecturers who teach courses are given access to edit or add material available on the material links in each of these materials; (3) Lecturers who support courses are given access to edit or add assignments that will be given on the assignment link in each of these materials; (4) Lecturers only need to share the link at the start of the lecture, according to the schedule, and provide a deadline for the work. For example, schedule material A, then share the link for material A; (5) Students may only be given access to view and download without being able to edit, add, and delete files in the link; (6) Students can download materials or videos anytime and anywhere. The reason for using flipped classrooms (Bishop & Verleger, 2013; Mehring, 2017) is that the material presented is much more varied and complete because it is provided with material modules, e-books, videos, and PPTs packaged in only one link. Then, the material can be downloaded by students freely whenever and wherever, so that if the opportunity is for students to be in a place with a good signal, they can download the material. Of course, it does not interfere with work. Furthermore, lecturers will benefit in managing learning time. When learning begins, the lecturer only provides a link to the material, so the possibility of changing the lecture schedule at night can be minimized.

The reason for using the flipped classroom, according to Mehring (2017), is that the material presented is much more varied and complete because it is provided with material modules, e-books, videos, and PowerPoints, which are packaged in only one link. According to Bishop and Verleger (2013), the material can be downloaded by students freely whenever and wherever, so if the opportunity is for students to be in a place with a good signal, they can download the material, and of course, it will not interfere with work. Lecturers will benefit from managing learning time. When learning begins, the lecturer only provides a link to the material, so the possibility of changing the lecture schedule at night can be minimized (Awidi & Paynter, 2019). According to Pimmer et al. (2014), cell phones are considered a means of cross-border crossing, one of which is other knowledge supporting the learning process. Furthermore, Ariffin et al. (2022) and Sánchez-Prieto et al. (2019) revealed that students' use of mobile devices for learning activities will make it easier and more enjoyable for them to learn. Ismail (2022) and Batubara et al. (2022) showed that learning to use mobile phones can significantly overcome problems that occur in students, such as boredom, loss of motivation, and limited interaction space. Based on this, we use Group Within Treatment (GWT) one-way analysis of variance. The GWT calculations for the three groups are presented in Table 2.

Table 2. Table Anova Group Within Treatment (GWT)

Source of Variance	JK	df	RJK	F_{cal}	$F_{tab(0,05;2;3)}$
between	14932.89333	2	7466.446667	114.5394764	9.552094496
within	2625.088	144	18.22977778		
GWT	195.56	3	65.18666667		
Total	21691.17333	149			

From the ANOVA GWT table above, it can be concluded that $F_{cal} > F_{tab(0,05;2;3)}$. This indicates differences in the learning outcomes of students who take online classes + flipped classroom learning media, students who take online classes + YouTube video learning media, and students who take online classes + lectures in tutorial activities after considering class (group) heterogeneity. These results conclude that different learning media in the distance learning model at the Universitas Terbuka influence student learning outcomes. Furthermore, the t-test, as a further test of the GWT calculation, obtains the following results in Table 3.

Table 3. T-test Comparison Table

T-Test Group	t_{cal}	$t_{tab(0,05;149)}$
The difference in Y in groups A1 and A2	28.71	1.66
The difference in Y in groups A1 and A3	57.24	
The difference in Y in groups A2 and A3	28.53	

Based on Table 3, the results are that in the first number, the learning outcomes of students who take online classes + flipped classroom learning media are higher than those of students who take online classes + YouTube video learning media. Whereas in the second number, the learning outcomes of students who take online classes and flipped classroom learning media are higher than those of students who take online classes and lectures in tutorial activities. Furthermore, in the third number, the learning outcomes of students who take online classes and YouTube video learning media are higher than those of students who take online classes and lectures in tutorial activities. This indicates that the most appropriate supporting learning media is the flipped classroom to improve the learning outcomes of students who apply distance learning, such as at Universitas Terbuka. However, it does not rule out the use of YouTube video learning media in its application.

The possible threats to internal validity that arise in this study are because in the GWT design using group divisions carried out based on specific criteria such as age, curriculum, and average ability of the students are the same, then threats to internal validity include subject characteristics, maturation, and statistical regression can be adequately controlled. Testing does not threaten this design because no subject is measured twice. Although many threats to internal validity can be controlled in this design, threats like mortality may be unavoidable. Because the two groups are stated to be similar (identical), the dropouts from the two groups are expected to be the same. Of course, this can affect the results of the posttest later. However, absenteeism can control this for each subject's presence in these groups. This research also discusses that YouTube-based learning videos can improve student learning outcomes. However, in the comparison results, the value of the influence of learning videos on student learning outcomes is not high. This research differs from [Reina et al. \(2021\)](#) because, in video-based learning, support from flipped classroom learning media is needed so students are directed in the learning process. Thus, they quickly access the material and the material shown in YouTube videos under their learning needs ([Sudrajat et al., 2022](#)). The results of this study show that community-based education can be developed through higher education with a system that can reach all levels of community and is easily accessible. In contrast to [Asghar et al. \(2024\)](#), learning through social media has limitations due to the absence of guidelines.

In addition, the material provided and the relevance of the time required cannot be appropriately controlled. Therefore, the learning system provided by Universitas Terbuka influences student learning outcomes. This is because the difference in T-test values for students who conduct online classes with flipped classroom learning media is higher than for those who take online classes and use YouTube video media. Thus, this study's results differ from [Lacey and Wall \(2021\)](#). Video-based learning influences student learning outcomes, but its value is not high. This is because not all videos on the YouTube channel match the learning theme. On the other hand, [Lee et al. \(2023\)](#) state the need to select online learning materials and methods that require pedagogical arguments.

The results of this study indicate that a flipped classroom method is needed to implement learning media through online systems to improve student learning outcomes. Thus, students are not only limited to attending online classes but also can learn independently. The results of this study align with [Rusk et al. \(2024\)](#), who state that community-based education also requires the role of technology to create a technology-savvy community. In addition, creative learning can foster user interest and student motivation to learn. In addition, this study's results align with [Anlimachie et al. \(2025\)](#) that community-based education can foster students' competence to support the needs of the community in which they live. Distance-based higher education can improve students' skills to achieve a superior community. On the other hand, this research also illustrates that online learning can help students improve their skills in using technology well ([Sudrajat et al., 2022](#)). This research also aligns with [Ampah-Mensah et al. \(2024\)](#). Community-based education through learning in higher education can assist the government in mobilizing human resources. In addition, it encourages changes in students' attitudes and perceptions towards education as a community. Thus, they can improve quality through education.

CONCLUSION

The results of this study conclude that community-based education can be conducted in higher education. A learning model that can increase students' potential with technology is needed to achieve a superior community. The distance learning system developed by the Universitas Terbuka is considered good by students and lecturers. However, in the comparative test results, there is a difference in the influence of students who take part in online classes and use YouTube video learning media and students who take part in online classes and use flipped classrooms on learning outcomes. This research has implications for technology-based learning innovation. Community-based education conducted by Universitas Terbuka is a mechanism that provides opportunities for students to enrich science and technology through learning. In addition, the distance learning system offered by Universitas Terbuka is a form of democratic community-based education that fulfills the expansion of education services to rural areas.

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