

Accessibility of Nonformal Education: Between Student Participation and Flexibility of Learning Time

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ABSTRACT

Nonformal Education offers distinct levels of accessibility compared to formal Education, heavily relying on student inclusion and flexible schedules to facilitate the learning process. However, the specific combined impact of active student involvement and schedule flexibility on overall educational accessibility remains underexplored. This study aims to examine how student involvement and time flexibility simultaneously influence the accessibility of nonformal Education. Using a quantitative research design, data from respondents were analyzed using a one-way ANOVA (F-test). The findings revealed a statistically significant combined effect of student involvement and time flexibility on nonformal education accessibility, $F_{count} = 11.023 > F_{table} = 1.532$, $p < 0.05$. It is concluded that nonformal Education becomes significantly more accessible when it prioritizes active student participation and flexible scheduling. These results imply that nonformal education providers should foster mutual agreements on the timing and location of learning to maximize student comfort, engagement, and overall educational accessibility.

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1. INTRODUCTION

Not all individuals are granted their educational entitlement, particularly in the context of formal or institutionalized schooling. A significant number of school-age children fail to engage in the educational process at school, primarily due to various factors. Formal Education or schooling will not impose a financial strain on families who are aware and have sufficient economic resources. The presence of favorable geographic conditions and a well-developed family infrastructure facilitates access to Education, resulting in a population that actively contributes to the nation's intellectual advancement. Education is vital for individuals who possess elevated economic and social standing. Some individuals recognize

that Education is crucial in shaping their destiny [1]. Education is the key to achieving success in all endeavors.

Nevertheless, they are unable to engage in the instructional process at school effectively. This is attributed to the limitation of parental awareness, which lacks support. Parents persist in the belief that investing money in their children's Education for three years would be more advantageous and lucrative if it were instead used to purchase goats or other livestock, as their value is expected to appreciate over the same period [2].

For certain individuals in the community, pursuing formal Education poses challenges stemming from economic limitations, geographical constraints, distance from educational institutions, social and environmental factors, and mental barriers or a lack of knowledge in the field of Education. As a consequence, certain individuals in our society have chosen to discontinue their Education. Withdrawing from school is a significant issue that not only affects educational indicators but also leads to severe social problems. By prematurely exiting school before obtaining official graduation status, the generation is deprived of their entitlement to a sufficient education, which in turn hinders their ability to attain economic wealth and social standing during their productive years [5].

To address this, nonformal Education serves as a substitute, addition, or complement to formal Education. According to national data from the Ministry of Education and Culture's Dapodik, there are now 1,737,039 individuals enrolled in equivalency education across 10,728 institutions in Indonesia. While the government has implemented several initiatives, such as the Compulsory Education Program and equivalency education (Packages A, B, and C), attaining equitable Education remains challenging. Society has become accustomed to centralized government management, which has diminished schools' capacity for innovation and the community's sense of ownership. Furthermore, graduates with equivalent Education are occasionally regarded with contempt and face skepticism regarding their academic aptitude and social competencies. Formal Education is still very rigid and needs to be more flexible, participatory, and collaborative, underscoring the critical need to optimize nonformal education pathways [9], [10].

Previous studies have extensively explored the dimensions of accessibility and community participation in Education. Scholars have generally defined accessibility as the degree of ease, comfort, and efficiency in reaching resources, measured in terms of time, cost, and effort, overcoming both physical and non-physical barriers [16]–[19]. In the field of Education, literature traditionally divides accessibility into two main aspects: physical accessibility, which relates to the ease of reaching facilities, and financial accessibility, which relates to the ability to cover educational costs [24]–[26]. Concurrently, research on community participation highlights it as the active involvement of individuals or community groups in contributing ideas, effort, time, or materials to solve problems, acting as a tangible manifestation of community aspirations [6], [27]–[29]. These existing studies consistently show that optimal physical and financial access, combined with active stakeholder participation, significantly improves educational outcomes.

Despite the abundance of literature on educational accessibility and community participation, a significant gap remains. Most previous studies tend to evaluate physical and financial barriers independently, often overlooking the critical dimension of temporal

accessibility, specifically, the flexibility of learning time. Furthermore, while the structural components of nonformal Education have been widely discussed, there is limited empirical evidence examining how time flexibility specifically interacts with and mitigates participation barriers for adult and working-age learners in marginalized communities. The relationship between flexible scheduling and actual student participation within the context of nonformal Education, particularly in regions with complex socio-geographical landscapes like Central Java, remains underexplored.

This study introduces a novel perspective by positioning learning time flexibility not merely as an administrative feature but as a core component of educational accessibility that directly dictates student participation. Unlike previous research that focuses predominantly on spatial and financial constraints, this research highlights the temporal dimension as a critical catalyst for engagement in nonformal education. By focusing on Central Java Province, this study provides a unique contextual analysis of how flexible learning models can serve as a primary safety net for individuals marginalized from the rigid structures of formal Education.

Therefore, the primary objective of this study is to examine the accessibility of nonformal Education in Central Java Province, specifically focusing on the relationship between student participation and the flexibility of learning time. This research will investigate whether the offered flexibility of learning time can successfully overcome the main barriers faced by the community, such as time constraints for workers, and evaluate if this flexibility genuinely improves overall educational accessibility and participation.

The findings of this study are expected to provide significant theoretical and practical contributions. Theoretically, it enriches the existing literature on educational accessibility by integrating the temporal dimension and linking it directly to student engagement metrics. In practice, the results of this study will serve as a crucial foundation for policymakers, educational institutions, and community organizers in designing lifelong learning programs that are more adaptive, inclusive, and aligned with community needs. Ultimately, it aims to support the development of a resilient educational framework that ensures marginalized populations can achieve their rights, honor, and dignity on par with individuals receiving formal schooling.

2. METHOD

This study employed a quantitative research design utilizing a causal explanation approach to address the research questions and validate the hypotheses. The primary objective is to examine the impact of student engagement (as an exogenous factor) on the accessibility of nonformal Education (as an endogenous factor), while specifically investigating how time flexibility acts as a moderating factor in this relationship.

The research was conducted throughout Central Java Province, Indonesia. The data collection process was conducted over three months, from March to May 2025. The population for this research comprised nonformal education students across Central Java Province, totaling 9,347 individuals. Based on the 10% sampling formula proposed by A. Banerjee and S. Chaudhury [30], the calculated sample size was 934 respondents. These participants were actively enrolled in various nonformal education programs within the

province. The participants were selected using a proportionate random sampling technique, taking 10% of the total population to represent the broader demographic of nonformal education students in Central Java [30].

This study utilized both primary and secondary data. Primary data were collected directly from respondents through their responses to the distributed questionnaires. Secondary data were gathered from institutional records, encompassing brief histories and the organizational structures of the nonformal education institutions involved. Data collection was primarily conducted through structured questionnaires. Prior to distribution, the researcher provided clear explanations and instructions to the respondents about the study's purpose. The researchers awaited the completion of the questionnaires to ensure a high response rate. Respondents completed the survey by selecting the provided alternative answers via a checklist method. The main research instrument was a Likert-scale questionnaire. The Likert scale is a multi-level measurement method in which each indicator of a variable is represented as a statement item, and the answer choices are assigned varying numerical weights [31].

Variables and Measurement The research model involves three main variables (as illustrated in Figure 1):

1. Independent/Exogenous Variable (X): Student participation.
2. Dependent/Endogenous Variable (Y): Accessibility of nonformal education.
3. Moderating Variable (Z): Time flexibility.

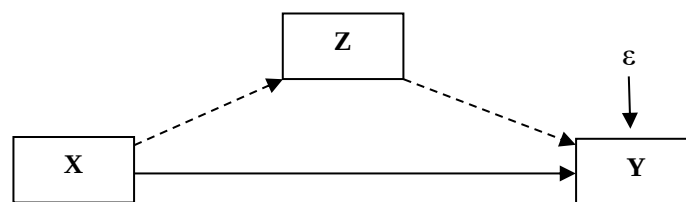


Figure 1. Research Design Model

Information:

X : *Student participation*(exogenous variable)

Y : Accessibility of nonformal Education (endogenous variable)

Z : Time flexibility (moderating variable)

—→ : Contribution direct

---→ : Contribution indirect

ε : Coefficient error

Prior to the main data collection, the instrument was tested for validity and reliability. Validity was assessed using internal consistency via the Pearson Product-Moment correlation method [32]. A question item is considered valid if its significance value is < 0.05 and the calculated r -value r_{count} is higher than the r -table. The validity test results for all variables indicated that $r_{count} > r_{table} = 0.0967$, confirming that all questionnaire items were valid. Reliability was measured using the Cronbach's Alpha statistical test in SPSS. A construct is considered reliable if it yields a Cronbach's alpha coefficient > 0.6 [33]. The

reliability test results indicated that the alpha values for student engagement, accessibility, and time flexibility all exceeded 0.6, confirming high consistency and dependability.

Data analysis was conducted using Path Analysis to determine both the direct and indirect contributions among variables, utilizing SPSS version 26.0. Before running the path analysis, classical assumption tests were performed to ensure unbiased results:

1. Normality Test: Conducted using the Kolmogorov-Smirnov test on residual values [34], alongside histogram and probability plot evaluations. The data met the normality assumption ($\text{sig} > 0.05$).
2. Multicollinearity Test: Evaluated using the Variance Inflation Factor (VIF). A VIF value below 10 indicated the absence of multicollinearity in the regression equation.
3. Heteroscedasticity Test: Conducted using the Glejser test [35]. A $p\text{-value} > 0.05$ confirmed that the regression model did not exhibit heteroscedasticity.

After these assumptions were met, path diagrams were created based on the hypothesis [36]. The path analysis was calculated using the substructure path equations to estimate the error coefficient (E), direct contributions (without intermediary variables), and indirect contributions (through the moderating variable).

All procedures involving human participants were conducted in accordance with ethical research standards. Prior to answering the questionnaire, informed consent was obtained from all respondents. Participants were informed about the purpose of the study, that their involvement was entirely voluntary, and that they had the right to withdraw at any time. Strict confidentiality and anonymity of respondents' identities and answers were maintained, and the collected data were used exclusively for academic research.

3. RESULTS AND DISCUSSION

3.1. Results

This section presents the findings from the quantitative data analysis, evaluating the relationships among student participation, time flexibility, and the accessibility of nonformal Education. The presentation encompasses the classical assumption test results, path analysis calculations, and the outcomes of the hypothesis testing to address the core research objectives.

The study analyzed data collected from a sample of 934 respondents enrolled in nonformal education programs across Central Java Province. The respondents of this study were students from packages A, B, and C throughout Central Java Province. Prior to conducting the path analysis, general descriptive statistics were evaluated to ensure the data adequately represented the target population.

Classical Assumption Test Results

To ensure the regression models produced unbiased and valid results, classical assumption tests comprising normality, heteroscedasticity, and multicollinearity tests were conducted prior to the primary path analysis.

- a) Normality Test: The Kolmogorov-Smirnov test was utilized on the residual model. The significance value obtained was 0.621, which exceeds the threshold ($\alpha = 0.05$). Coupled

with a normal distribution pattern in the histogram and probability plots, centered around the diagonal line, the data is confirmed to be normally distributed.

- b) Heteroscedasticity Test: The Glejser test was applied by regressing the independent variables on their absolute residuals. The significance values for student participation (0.091) and time flexibility (0.097) are both greater than 0.05. Thus, the assumption of non-heteroscedasticity is fulfilled.
- c) Multicollinearity Test: Evaluated using the Variance Inflation Factor (VIF) and Tolerance limits. Both student participation and time flexibility yielded a Tolerance value > 0.10 and a VIF of 2.102 (which is < 10). Therefore, there is no multicollinearity among the independent variables.

The path analysis was conducted in two substructures to forecast the direct and indirect impacts of student participation (X) and time flexibility (Z) on the accessibility of nonformal Education (Y).

1. First Substructure Path Analysis

This model examines the direct relationship between student participation (X) and the accessibility of nonformal education (Y).

Table 1. First Path Analysis Test Results

Model	Beta (β)	R Square
(Constant)	61.276	0.179
Student participation (X)	0.629	

Based on Table 1, the first substructure path equation is formulated as:

$$Y = 61.276 + 0.629X + \varepsilon_1 \quad 1)$$

Interpretation: The constant 61.276 represents the base accessibility when student participation is zero. The positive beta coefficient (0.629) signifies that a one-unit increase in student participation directly improves nonformal education accessibility by 0.629 units. The error term ($\varepsilon_1 = 0.906$) indicates the influence of unexamined components on this first substructure.

2. Second Substructure Path Analysis

The second model incorporates time flexibility (Z) to examine the combined and moderating effects on accessibility (Y).

Table 2. Second Path Analysis Test Results

Model	Beta (β)	R Square
(Constant)	41.924	0.317
Student participation (X)	0.347	
Time flexibility (Z)	0.501	

Based on Table 2, the second substructure path equation is:

$$Y = 41.924 + 0.347X + 0.501Z + \varepsilon_2 \quad 2)$$

Interpretation: When integrating time flexibility, the base accessibility drops to 41.924. However, both variables show positive coefficients. A one-unit increase in student participation improves accessibility by 0.347 units, while a one-unit increase in time flexibility improves it by 0.501 units. The error term ($\varepsilon_2 = 0.826$) represents the variance explained by factors outside this second model.

Hypothesis Testing Results

To validate the significance of the formulated path models, both partial (t-test) and simultaneous (F-test) hypothesis testing were conducted.

Table 3. Partial Test Results (t-test)

Independent Variable	tcount	Sig. t	ttable	Information
Student participation (X)	4.170	0.000	2.003	Significant

Partial Effect (H1 accepted): The t-test for student participation yielded a tcount of 4.170, which is significantly higher than the ttable of 2.003, with a significance level of 0.000 (< 0.05). This confirms that student participation has a substantial and significant partial influence on the accessibility of nonformal Education.

Table 4. Simultaneous Test Results (F-test)

Model	Df	Ftable	Fcount	Sig.
Regression	3	1.532	11.023	0.000
Residual	931			
Total	934			

Simultaneous Effect (H2 accepted): The F-test evaluated the combined influence of X through Z on Y. The computed Fcount is 11.023, which greatly exceeds the Ftable value of 1.532. The significance level stands at 0.000 (< 0.05). Thus, the null hypothesis (H_0) is rejected, indicating that student involvement and time flexibility simultaneously exert a substantial impact on the accessibility of nonformal Education.

Summary of Key Findings

Overall, the statistical analyses confirm that both student participation and time flexibility are critical determinants of educational accessibility. The overall R^2 value for the integrated model indicates that student engagement characteristics, particularly when moderated by time flexibility, account for 53.7% of the readiness and accessibility of nonformal Education. The remaining 46.3% of the variance is attributed to other external factors not investigated in this study.

3.2. Discussion

The findings of this study confirm that both student participation and time flexibility significantly impact the accessibility of nonformal Education. The first path equation demonstrated that student participation independently contributes to educational accessibility. When time flexibility was introduced as a moderating variable in the second path model, both variables exerted a substantial influence simultaneously. Together, student participation and time flexibility account for 53.7% of the variance in the accessibility of nonformal Education, while other factors outside the scope of this study influence the remaining 46.3%.

The statistical results indicate a strong positive relationship among the variables. In the first substructure, the positive coefficient for student involvement (0.629) indicates that active student engagement directly increases perceived accessibility of these programs. In the second substructure, the introduction of time flexibility yields a high coefficient (0.501), indicating it is a powerful catalyst. This means that providing adaptable learning schedules directly lowers the barriers to entry. For marginalized individuals or adult learners who must balance Education with employment or familial duties, time flexibility transforms nonformal Education from an out-of-reach ideal into a practical, accessible reality.

The substantial partial influence of student participation ($t_{\text{count}} = 4.17 > 2.003$; $\text{sig} = 0.000$) aligns with findings by Veza (2023) [37], who demonstrated that technological interventions (such as ChatGPT) enhanced accessibility and inclusion for 75.6% of higher education participants by leveling the learning landscape for students with varied needs.

Furthermore, the systemic necessity for flexibility mirrors the arguments presented by Lee [23], who emphasized the shortcomings of rigid, traditional conceptualizations of remote Education and advocated for more refined, multifaceted methods to expand educational availability. Additionally, the simultaneous impact of our variables ($F_{\text{count}} = 11.023 > 1.532$) reflects broader educational challenges noted by Parthasarathy et al. (2024), indicating that successfully teaching and implementing digital accessibility requires overcoming ingrained systemic obstacles, much like those faced in nonformal Education [38].

These findings can be explained through the lens of Adult Learning Theory (Andragogy) and lifelong learning frameworks. Unlike traditional pedagogy, adult learners in nonformal Education are heavily motivated by practical relevance and self-direction. Time flexibility directly caters to the andragogical need for autonomy, allowing learners to integrate Education into their existing life structures rather than forcing them to abandon their livelihoods. When education schedules are rigid, physical and financial accessibility become irrelevant because the *temporal barrier* prevents participation. Thus, flexibility acts as the critical bridge connecting student intent with actual educational engagement.

A notable finding in the path models is the relatively high error terms ($E1 = 0.906$ and $E2 = 0.826$), leaving 46.3% of the variance in accessibility unexplained by participation and time flexibility alone. While unexpected, given the focus on flexibility, this aligns with the nuanced observations in Veza's (2023) study [37], where some students remained skeptical or unengaged despite new accessibility tools. Similarly, while structured strategies (such as collegial supervision) impact performance-based learning, they do not always

directly translate into immediate learning outcomes [38]. This suggests that while time flexibility is a prerequisite for access, it is not a cure-all; underlying issues such as financial constraints, digital literacy, and infrastructural deficits likely account for the remaining barriers.

Implications of the Study

- a) Theoretical Implications: This study expands the traditional concept of educational accessibility, which usually focuses only on geographic (physical) and economic (financial) barriers, by empirically demonstrating that *temporal accessibility* (time flexibility) is an equally critical dimension in nonformal Education.
- b) Practical Implications: Institutions providing equivalency education (Packages A, B and C) must prioritize asynchronous learning modules and highly adaptable schedules. Educators should shift from rigid attendance requirements to outcome-based participation metrics.
- c) Policy Implications: The government and the Ministry of Education should formulate policies that explicitly protect and standardize flexible learning hours in Community Learning Activity Centers (CLAC), ensuring diplomas earned through these adaptable pathways retain equal societal and professional recognition.

Despite its contributions, this study has several limitations. First, the path model accounts for 53.7% of the variance, meaning nearly half of the factors influencing nonformal education accessibility were not examined in this research. Second, the data are quantitative and rely on self-reported questionnaires, which may not capture the deep, subjective emotional or socio-economic struggles of drop-out students. Finally, the study is geographically confined to Central Java Province, which may limit the generalizability of the findings to regions with vastly different geographic or digital infrastructures.

Future researchers are encouraged to investigate the remaining 46.3% of the unexplained variance by incorporating additional variables such as family economic status, geographical isolation, and digital infrastructure readiness. Additionally, conducting qualitative or mixed-methods studies would be highly beneficial for gaining a deeper, more subjective understanding of the lived experiences of adult learners and for exploring why some individuals fail to participate even when flexible schedules are provided.

4. CONCLUSION

This study aimed to examine the impact of student participation on the accessibility of nonformal Education in Central Java Province, specifically investigating how learning time flexibility moderates this impact. The findings clearly answer the research objective by demonstrating that student participation significantly and positively enhances the accessibility of nonformal Education. Furthermore, when time flexibility is integrated into the learning model, the positive impact on accessibility is substantially amplified. These results confirm that allowing students to learn anywhere, at any time, by mutual agreement and with flexible scheduling, makes Education significantly more comfortable and attainable for marginalized or working-age learners.

Theoretically, this study contributes to the literature on lifelong learning and adult education by introducing "temporal accessibility" (time flexibility) as a critical dimension of educational access, expanding beyond the traditional focus on merely physical and financial barriers. In practice, the findings suggest that nonformal education institutions, such as Community Learning Activity Centers (CLACs), must prioritize highly adaptable, asynchronous learning schedules to maximize student engagement. For policymakers, this highlights the need to support and legally validate flexible learning models so that equivalent education programs can truly serve as a robust safety net for school dropouts.

Despite these significant findings, this study has limitations. The formulated model accounts for 53.7% of the variance in educational accessibility, leaving nearly half of the influencing factors unexamined. Additionally, the quantitative nature of the self-reported survey may not capture the deep socio-economic nuances of the learners, and the geographical focus on Central Java may limit broader generalizability. Therefore, future research should explore the remaining 46.3% of unexplained variance by investigating other potential barriers, such as digital infrastructure readiness and family economic status. Future studies are also encouraged to employ qualitative or mixed-methods approaches to gain a more comprehensive understanding of the subjective experiences and challenges faced by nonformal education students.

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