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Analysis Of Tutor Andragogical Competence And Academic Climate On The Effectiveness Of The Equivalency Education Program In Manado City

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Abstract

The effectiveness of an equivalency education program cannot be guaranteed merely by its existence; rather, it is determined by tutors' competence in facilitating adult learning and the extent to which the academic climate supports learners. This study aims to analyze the effects of tutors' andragogical competence and academic climate on the effectiveness of the Paket C equivalency education program in Manado City, both partially and simultaneously. A quantitative correlational approach was employed, involving a population of 350 Paket C learners across Manado City. A sample of 187 respondents was determined using Slovin's formula and proportional random sampling. Data were collected using a Likert-scale questionnaire whose validity and reliability had been tested, and were subsequently analyzed using multiple linear regression. The results indicate that tutors' andragogical competence has a positive and significant effect on program effectiveness (Beta = 0.488; t = 9.059; p < 0.001), as does academic climate (Beta = 0.418; t = 7.770; p < 0.001). Simultaneously, both variables have a significant effect on program effectiveness, accounting for 48.1% of the variance (F = 85.313; p < 0.001), while the

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remaining 51.9% is explained by factors outside the model. These findings confirm that tutors' andragogical competence and academic climate complement each other, with tutors' andragogical competence making the largest relative contribution. This study recommends continuously strengthening tutors' andragogical capacity while fostering a conducive academic climate as a dual strategy for improving the effectiveness of equivalency education programs.

Keywords: equivalency education; tutors' andragogical competence; academic climate; program effectiveness

INTRODUCTION

Equivalency education (Paket A, B, and C) is a nonformal education pathway that provides a second chance for individuals who have dropped out of school or have not been served by the formal education system. International and national evidence indicates that the effectiveness of such programs depends heavily on the quality of adult learning, ranging from andragogical learning models for school dropouts in Gorontalo (Djibu et al., 2019) and empowerment training for women in Kupang (Adu & Sujarwo, 2019) to nonformal curriculum strategies in Taiwan (Yang, 2019) and Second Chance Schools in Greece (Radiopoulou et al., 2026). However, self-directedness, a defining characteristic of andragogy, cannot be assumed to develop automatically in learners, as the self is shaped socially, culturally, and discursively (Kruszelnicki, 2020). The role of tutors in facilitating self-awareness and critical reasoning is therefore an important determinant of program effectiveness.

The existence of an equivalency education program does not automatically guarantee its effectiveness. Learners are generally adolescents and adults who work and often return to education after a lengthy interruption. When tutors teach using conventional formal-school approaches, learners' motivation may decline. This pattern has been observed in adult literacy classes in Zambia, where instruction remained dominated by teacher-centered lectures (Sichula & Genis, 2019), in contrast to the application of participatory constructivist principles, which have been found to enhance learner motivation (Mayombe, 2020). Manado City, as one of the areas providing equivalency education, faces a similar need. The 2025 Operational Curriculum Document of PKBM Mandiri Manado records 181 learners at a single educational institution, 87 of whom are enrolled in Paket C. This study focuses on Paket C learners across Manado City (a population of 350; see the Research Methods section) because this level is most closely

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associated with the characteristics of adult learners and is therefore particularly relevant for assessing tutors' andragogical competence.

Tutor competence is a recurring focus in the nonformal education literature, from the dominance of lecture-based methods in Zambia (Sichula & Genis, 2019) and Cambodia (Lang, 2026), to the limited formal qualifications of educators working with older adults in Poland (Tomczyk et al., 2022), and andragogy-based training in Mexico, which improved teaching evaluation scores even though only a small proportion of facilitators reported increased recognition or income (Torres Mata et al., 2025). In Indonesia, Sunarti et al. (2024) adopted the Technological Andragogical Content Knowledge framework among 97 community learning center (PKBM) instructors in West Sumatra. However, the pretest–posttest design without a control group limits the strength of the evidence.

Beyond tutor competence, academic climate also shapes learning experiences and outcomes. Interaction and self-efficacy are associated with learning satisfaction among adult learners from minority groups (Kuo & Belland, 2016), while face-to-face support has been evaluated considerably more positively than online components in a literacy program in Ontario (Li et al., 2018). Recent evidence from 978 students at Ambon State Polytechnic indicates that academic climate has a positive and significant effect on learning interest (Adjusted $R^2 = 0.333$), with lecturer support and peer relationships emerging as the strongest indicators (Abdin et al., 2025). However, an unfavorable learning climate has also been widely observed in equivalency education settings. Among 32 Paket B learners at PKBM Sentosa Hati Padang, both the learning climate and learning interest were low, consistent with poor science learning outcomes, with only 28.6% of learners meeting the minimum mastery criteria (Nurvallah & Sunarti, 2026). These findings underscore that a positive academic climate in equivalency education institutions cannot simply be taken for granted.

The effectiveness of nonformal education programs is generally assessed in terms of changes in learning outcomes and learner engagement. Examples include a randomized controlled trial involving 717 adult women in India, which demonstrated the positive impact of a computer-based literacy program (Deshpande et al., 2017); a quasi-experimental study of Second Chance Schools in Greece (Radiopoulou et al., 2026); and various learning technology innovations, such as intelligent tutoring systems (Chen et al., 2021; Hollander et al., 2023) and game-based learning (Tur et al., 2025). Nevertheless, these findings do not yet explain how tutors' competence and the learning climate are jointly associated with program effectiveness.

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The literature review above reveals four research gaps. First, tutor competence and learning climate have generally been examined separately (Sichula & Genis, 2019; Torres Mata et al., 2025; Uribe, 2026). Second, existing evidence is dominated by small-scale perception studies, with relatively few studies employing causal research designs (Akintolu et al., 2023; Li et al., 2018; Mayombe, 2020). Third, evidence from the Indonesian context remains limited and is based on relatively small-scale studies (Adu & Sujarwo, 2019; Djibu et al., 2019; Sunarti et al., 2024). Fourth, the perspectives of the most vulnerable learners remain underrepresented (Deshpande et al., 2017; Radiopoulou et al., 2026).

Addressing these gaps, this study aims to analyze the effects of tutors' andragogical competence and academic climate, both partially and simultaneously, on the effectiveness of the equivalency education program among Paket C learners in Manado City. The novelty of this study lies in the simultaneous examination of these two variables in a context that has received relatively little research attention. Specifically, this study addresses three research questions: (1) Does tutors' andragogical competence affect program effectiveness? (2) Does academic climate affect program effectiveness? and (3) Do tutors' andragogical competence and academic climate simultaneously affect program effectiveness?

Theoretical Framework and Hypotheses

The theoretical framework of this study is based on two overarching theories. General systems theory (Bertalanffy, 1968) conceptualizes program effectiveness as the output (product) resulting from the interaction between tutor competence and academic climate as inputs and the andragogical learning process. Social cognitive theory (Bandura, 1986) explains learning behavior through reciprocal determinism among personal factors (tutor competence), environmental factors (academic climate), and behavior (learning engagement and outcomes).

Tutors' andragogical competence (X1) draws on the six assumptions of andragogy proposed by Knowles et al. (2015): the need to know why learning is necessary, self-direction, the use of life experiences, a task-oriented approach, a problem-solving orientation, and internal motivation. These assumptions are integrated with Spencer and Spencer's (1993) iceberg model of competence and the four domains of educator competence stipulated in Law No. 14/2005 (Republic of Indonesia, 2005).

Academic climate (X2) is grounded in Tagiuri and Litwin's (1968) organizational climate theory, Hoy and Miskel's (2013) theory of organizational climate in educational settings, and

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Moos's (1979) educational climate scale. It encompasses physical, relational, and learning system/culture dimensions. The effectiveness of the equivalency education program (Y) is explained through Stufflebeam's CIPP evaluation model (2003; Stufflebeam & Coryn, 2014), which conceptualizes effectiveness in terms of product outcomes arising from the program's context, input, and process components.

Based on the theoretical framework above, this study formulates three hypotheses:

H1: Tutors' andragogical competence (X1) has a significant partial effect on the effectiveness of the equivalency education program (Y).

H2: Academic climate (X2) has a significant partial effect on the effectiveness of the equivalency education program (Y).

H3: Tutors' andragogical competence (X1) and academic climate (X2) simultaneously have a significant effect on the effectiveness of the equivalency education program (Y).

The relationships among these variables are illustrated in Figure 1, with solid lines representing the partial effects (H1 and H2) and a dashed line representing the simultaneous effect (H3).

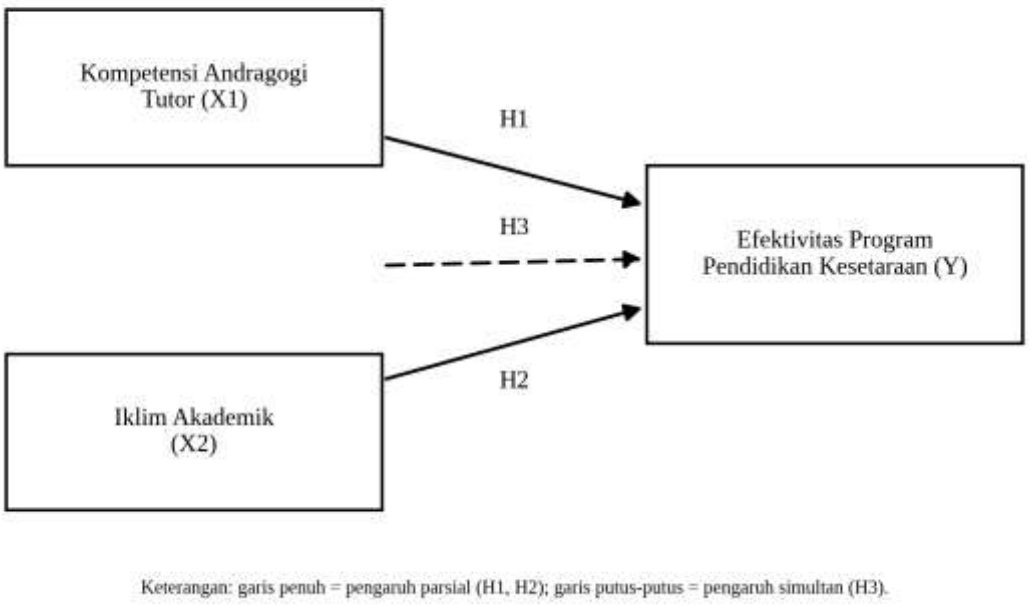


Figure 1. Research Conceptual Framework

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RESEARCH METHODS

Research Design

This study employed a quantitative approach with a correlational design to examine the effects of tutors' andragogical competence (X1) and academic climate (X2) on the effectiveness of the equivalency education program (Y), both partially and simultaneously, in accordance with hypotheses H1–H3. The correlational design was selected because the study did not involve any treatment or intervention but instead measured the naturally occurring relationships among variables within the learner population.

Population, Sample, and Sampling Technique

The study population comprised all Paket C equivalency education learners across Manado City (350 individuals). The sample size was determined using Slovin's formula (=0.05*d*=0.05): 3501+350(0.05)2=186.67*n*=1+350(0.05)2350=186.67. The result was rounded up to 187 respondents. The sampling technique employed was proportional random sampling, in which respondents were randomly selected while accounting for the proportion of learners in each population stratum, ensuring that the sample composition reflected that of the population.

Research Instruments

Data for all three variables were collected using Likert-scale questionnaires developed based on the indicators in the theoretical framework. The questionnaires consisted of 18 items for X1, 15 items for X2, and 18 items for Y. The instruments were pilot-tested with 30 respondents who were not included in the main sample. Validity was assessed using the Pearson Product-Moment correlation, with the calculated coefficients compared against the critical *r*-value of 0.3610 (=30*n*=30, =28*df*=28). All items were declared valid, with calculated correlation coefficients ranging from 0.5558 to 0.8139 for X1, 0.4428 to 0.6959 for X2, and 0.4946 to 0.8066 for Y. Consequently, all 51 items were retained for the main data collection. Reliability testing using Cronbach's alpha indicated that all three instruments were reliable, with coefficients of α = 0.9402 for X1, α = 0.8613 for X2, and α = 0.8854 for Y.

Variables and Operational Definitions

Tutors' andragogical competence (X1) was defined as the learners' perceived assessment of tutors' ability to apply the six andragogical assumptions proposed by Knowles et al. (2015) in

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the learning process. Academic climate (X2) was defined as the learners' perceived assessment of the quality of interactions, social support, sense of safety and engagement, and adequacy of learning facilities. The effectiveness of the equivalency education program (Y) was defined as the program's achievement score based on the context, input, process, and product dimensions of the CIPP model (Stufflebeam, 2003). All three variables were measured using Likert scales, with higher scores indicating a higher or more positive level of the measured perception.

Data Collection Procedures

Data collection was conducted through the following steps: (1) obtaining research permission from the Manado City Education Office and the administrators of community learning centers (PKBM) across Manado City; (2) pilot-testing the instruments with 30 respondents outside the main sample; (3) distributing the final questionnaires to the 187 sampled respondents in July 2026; and (4) checking the completeness of the collected data before proceeding with further analysis.

Data Analysis Techniques

The data were analyzed using IBM SPSS Statistics version 25. Classical assumption tests included a residual normality test (One-Sample Kolmogorov–Smirnov), a multicollinearity test (Tolerance and Variance Inflation Factor [VIF]), and an autocorrelation test (Durbin–Watson) as prerequisites for multiple regression analysis. The results of these tests are presented in the Results and Discussion section. Hypotheses were tested using multiple linear regression at a significance level of $\alpha = 0.05$ to examine the partial effects of X1 and X2 on Y using the t-test and their simultaneous effect using the F-test.

RESULTS AND DISCUSSION

Results

Descriptive Statistics of the Research Data

Data were collected from 187 Paket C equivalency education learners across Manado City. The descriptive statistics for the three research variables are presented in Table 1.

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Table 1. Descriptive Statistics of the Research Variables (N = 187)

Variabel	N	Mean	Std. Deviation
X1 – Kompetensi Andragogi Tutor	187	66,23	10,063
X2 – Iklim Akademik	187	66,35	10,094
Y – Efektivitas Program Pendidikan Kesetaraan	187	66,65	10,353

The three variables showed relatively similar mean scores (66.23–66.65), with comparable variability across respondents (SD = 10.06–10.35).

Results of the Classical Regression Assumption Tests

Normality Test

The normality test of the regression model residuals using the One-Sample Kolmogorov–Smirnov Test (Table 2) yielded a K–S statistic of 0.046 and an Asymp. Sig. (2-tailed) value of 0.200 (> 0.05). Therefore, the residuals were considered to be normally distributed.

Table 2. Results of the Normality Test (One-Sample Kolmogorov–Smirnov Test)

Statistik	Nilai
N	187
Mean Residual	0,0000000
Std. Deviation Residual	7,45750189
Most Extreme Differences – Absolute	0,046
Most Extreme Differences – Positive	0,029
Most Extreme Differences – Negative	-0,046
Test Statistic (K-S)	0,046
Asymp. Sig. (2-tailed)	0,200

Uji Multikolinearitas

Tabel 3. Hasil Uji Multikolinearitas

Variabel Bebas	Tolerance	VIF	Keterangan
X1 – Kompetensi Andragogi Tutor	0,972	1,029	Tidak terjadi multikolinearitas

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Variabel Bebas	Tolerance	VIF	Keterangan
X2 – Iklim Akademik	0,972	1,029	Tidak terjadi multikolinearitas

Tolerance values were greater than 0.10 and VIF values were below 10 for both independent variables, indicating that the model was free from multicollinearity.

Autocorrelation Test

The Durbin–Watson value of 2.058 fell between dU and (4 − dU) for n = 187 and k = 2, indicating that the model was free from autocorrelation.

Detection of Influential Data (Outliers/Influential Cases)

Cook's Distance ranged from 0.000 to 0.077 (< 1.00), and the maximum Mahalanobis Distance was 11.665, which was below the critical χ^2 value (df = 2, α = 0.001) of 13.816. Therefore, no serious multivariate outliers were identified.

Results of the Intervariable Correlation Analysis

Table 4. Pearson Correlation Matrix Among Variables (N = 187)

Pasangan Variabel	r	Sig. (1-tailed)	Keterangan
X1 dengan Y	0,558	0,000	Signifikan, korelasi sedang–kuat
X2 dengan Y	0,500	0,000	Signifikan, korelasi sedang
X1 dengan X2	0,167	0,011	Signifikan, korelasi lemah

Korelasi X1–X2 yang lemah (r = 0,167) konsisten dengan hasil uji multikolinearitas pada Tabel 3, yang menunjukkan bahwa kedua prediktor relatif independen.

Hasil Uji Hipotesis (Analisis Regresi Linear Berganda)

Uji Parsial (Uji t)

Tabel 5. Hasil Uji Regresi Parsial (Uji t)

Variabel	B	Std. Error	Beta	T	Sig.
(Constant)	4,927	4,766	—	1,034	0,303

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Variabel	B	Std. Error	Beta	T	Sig.
X1 – Kompetensi Andragogi Tutor	0,502	0,055	0,488	9,059	0,000
X2 – Iklim Akademik	0,429	0,055	0,418	7,770	0,000

Persamaan regresi yang diperoleh adalah Y = 4,927 + 0,502 X1 + 0,429 X2. X1 berpengaruh signifikan secara parsial terhadap Y (t = 9,059; Sig. = 0,000 < 0,05), sehingga H1 diterima. X2 berpengaruh signifikan secara parsial terhadap Y (t = 7,770; Sig. = 0,000 < 0,05), sehingga H2 diterima.

Uji Simultan (Uji F)

Tabel 6. Hasil Uji Regresi Simultan (ANOVA)

Sumber Variasi	Sum of Squares	df	Mean Square	F	Sig.
Regresi	9592,440	2	4796,220	85,313	0,000
Residual	10344,266	184	56,219	—	—
Total	19936,706	186	—	—	—

Nilai F sebesar 85,313 dengan Sig. = 0,000 < 0,05 menunjukkan bahwa X1 dan X2 secara simultan berpengaruh signifikan terhadap Y, sehingga H3 diterima.

Koefisien Determinasi

Tabel 7. Ringkasan Model Regresi

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0,694	0,481	0,476	7,498	2,058

Nilai R^2 sebesar 0,481 menunjukkan bahwa X1 dan X2 secara bersama-sama menyumbang 48,1% variasi Y; sisanya (51,9%) dijelaskan oleh variabel lain di luar model. Ringkasan hasil model divisualisasikan pada Gambar 2.

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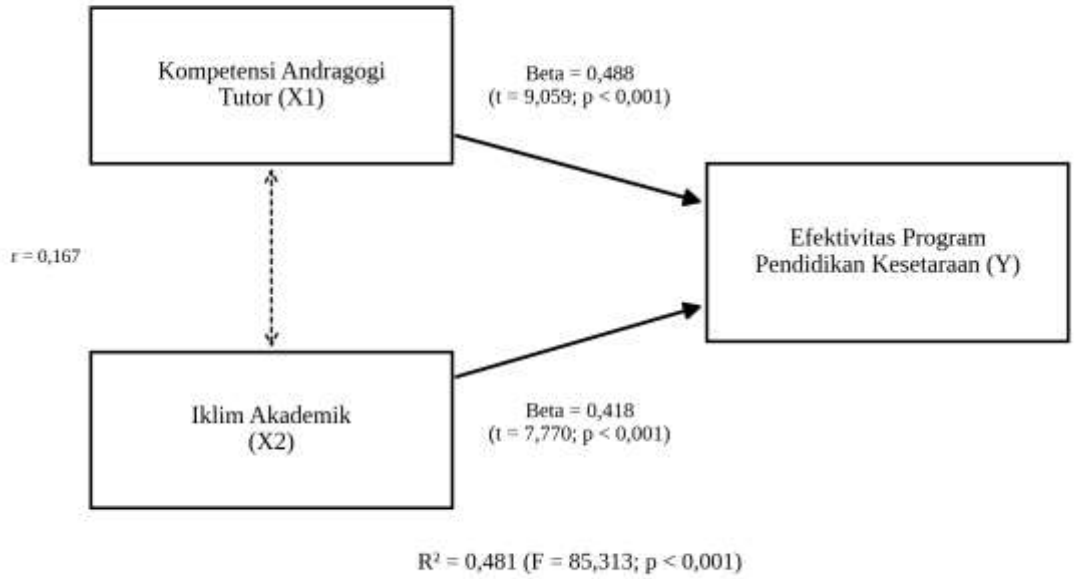


Figure 2. Diagram of the Multiple Linear Regression Model Results

Summary of Hypothesis Testing Results

Table 8. Summary of Hypothesis Testing Results

Hipotesis	Pernyataan	Hasil Uji Statistik	Keputusan
H1	X1 berpengaruh signifikan terhadap Y secara parsial	t = 9,059; Sig. = 0,000	Diterima
H2	X2 berpengaruh signifikan terhadap Y secara parsial	t = 7,770; Sig. = 0,000	Diterima
H3	X1 dan X2 berpengaruh signifikan terhadap Y secara simultan	F = 85,313; Sig. = 0,000	Diterima

DISCUSSION

The Effect of Tutors' Andragogical Competence on Program Effectiveness (H1)

Tutors' andragogical competence (X1) has a positive and significant effect on the effectiveness of the equivalency education program (Y), with a relative contribution (Beta =

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0.488) greater than that of academic climate (Beta = 0.418). Therefore, H1 is accepted. This finding directly answers the first research question by demonstrating that tutors' andragogical competence affects the effectiveness of the equivalency education program in Manado City. It also confirms Bandura's (1986) social cognitive theory, which conceptualizes tutor competence as a personal or agentic factor that reciprocally shapes learners' behavior and learning outcomes.

This result is consistent with findings that the application of constructivist principles by facilitators enhances adult learners' motivation and skills mastery in South Africa (Mayombe, 2020), as well as research on andragogy-based training in Mexico, which improved facilitators' teaching evaluation scores (Torres Mata et al., 2025). Conversely, when tutors' andragogical competence is low, as observed in adult literacy classes in Zambia that remained dominated by teacher-centered lectures (Sichula & Genis, 2019), the quality of learning tends to decline.

The substantial contribution of X1 in this study complements the findings of Sunarti et al. (2024), who reported improvements in Technological Andragogical Content Knowledge competence among community learning center (PKBM) instructors in West Sumatra. However, their pretest–posttest design without a control group limited the strength of their evidence. The present study adds correlational evidence from a larger sample (N = 187).

Theoretically, the dominant effect of X1 is consistent with the six andragogical assumptions proposed by Knowles et al. (2015), which were operationalized in the research instrument. It also reinforces Kruszelnicki's (2020) warning that self-directedness cannot be assumed to be an inherent characteristic of learners but must instead be actively facilitated by competent tutors.

The Effect of Academic Climate on Program Effectiveness (H2)

Academic climate (X2) was also found to have a positive and significant partial effect on the effectiveness of the equivalency education program (Y). Therefore, H2 is accepted, and the second research question is answered.

This finding is consistent with research involving 978 students at Ambon State Polytechnic, which demonstrated that academic climate has a positive and significant effect on learning interest, with lecturer support and peer support receiving the highest indicator scores (Abdin et al., 2025). It also aligns with findings that interaction and support from the learning environment are associated with learning satisfaction, which is positively correlated with learning performance among adult learners from minority groups (Kuo & Belland, 2016). Similarly,

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learners in a literacy and basic skills program in Ontario evaluated face-to-face components considerably more positively than online components (Li et al., 2018).

Notably, this finding provides an important point of comparison with Paket B learners at PKBM Sentosa Hati Padang, who reported an unfavorable learning climate associated with low science achievement in a single subject at a small-scale community learning center (Nurvallah & Sunarti, 2026). The present study extends and confirms the same direction of association in a broader context encompassing Manado City and using more comprehensive program effectiveness indicators based on the CIPP model (Stufflebeam, 2003).

The slightly smaller Beta contribution of X2 compared with X1 indicates that a conducive learning environment may not be sufficient without adequate tutor competence to make effective andragogical use of that environment. This interpretation is consistent with the perspectives of Tagiuri and Litwin (1968) and Hoy and Miskel (2013), who argue that organizational climate influences members' behavior, although its effects remain mediated by how tutors utilize that climate in the learning process.

The Simultaneous Effect of Tutors' Andragogical Competence and Academic Climate on Program Effectiveness (H3)

Tutors' andragogical competence and academic climate simultaneously have a significant effect on program effectiveness, accounting for 48.1% of the variance. Therefore, H3 is accepted. This finding supports general systems theory (Bertalanffy, 1968) and social cognitive theory (Bandura, 1986), which suggest that tutor competence and academic climate complement each other as two distinct input pathways.

The weak correlation between X1 and X2 ($r = 0.167$) further indicates that the two variables are relatively independent. Consequently, their combined contribution is not merely the overlap of a single construct. This finding addresses a research gap in the existing literature, in which tutor competence and learning climate have generally been examined separately (Sichula & Genis, 2019; Torres Mata et al., 2025; Uribe, 2026).

Nevertheless, the R^2 value of 0.481 also indicates that 51.9% of the variance in program effectiveness is explained by factors outside the model, such as intrinsic motivation, socioeconomic conditions, curriculum quality, or institutional support (Torres Mata et al., 2025).

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Theoretical Implications

The findings of this study have several theoretical implications. First, they reinforce the relevance of general systems theory (Bertalanffy, 1968) and social cognitive theory (Bandura, 1986) as overarching frameworks for explaining the effectiveness of nonformal education programs, particularly by positioning tutor competence and academic climate as two independent yet complementary input pathways.

Second, this study extends the application of the CIPP evaluation model (Stufflebeam, 2003) to the context of Paket C equivalency education in Indonesia. The findings empirically demonstrate that the input components—tutor competence and academic climate—make measurable and significant contributions to the product component, namely program effectiveness.

Third, by examining tutors' andragogical competence and academic climate simultaneously rather than separately, as has been common in previous literature (Sichula & Genis, 2019; Torres Mata et al., 2025; Uribe, 2026), this study provides preliminary evidence that an integrative model combining personal or agentic factors (andragogy) with environmental factors (organizational climate) is more appropriate for explaining equivalency education program effectiveness than a model focusing on only one of these factors.

Practical Implications

Practically, the finding that tutors' andragogical competence makes the largest relative contribution (Beta = 0.488) indicates that PKBM administrators responsible for Paket C programs in Manado City, together with the local Education Office, should prioritize the continuous development of tutor capacity. This could be achieved through structured andragogical training that emphasizes the ability to facilitate self-directed learning, connect learning materials with learners' life experiences and actual needs, and foster intrinsic learning motivation. This recommendation aligns with Torres Mata et al. (2025), who emphasized that facilitator training should be accompanied by adequate institutional support to ensure sustainable impacts.

At the same time, because academic climate also has a significant effect, program providers should not overlook the learning environment. Key considerations include the quality of interactions between tutors and learners, social support among learners, a sense of safety and engagement in academic activities, and the adequacy of learning facilities. These factors are

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particularly important in light of the need for interventions to address unfavorable learning climates in other equivalency education settings (Nurvallah & Sunarti, 2026).

In other words, the most effective intervention is likely to be a dual strategy that simultaneously targets tutor competence and academic climate rather than focusing on either factor alone.

Research Limitations

This study has several limitations that should be acknowledged. First, the research employed a correlational, cross-sectional design, with data collected at a single point in time. Therefore, the relationships identified among X1, X2, and Y are associative and cannot be interpreted as definitive causal relationships. The possible influence of unmeasured variables and reciprocal relationships cannot be entirely ruled out.

Second, all data were collected through self-report questionnaires completed exclusively by learners. Consequently, the findings may be subject to common method bias and do not reflect assessments from other perspectives, such as those of tutors and PKBM administrators, or objectively measured learning outcomes.

Third, the study population and sample were limited to Paket C learners across Manado City (n = 187). Therefore, generalizing the findings to other equivalency education levels (Paket A and Paket B) or to regions outside Manado City should be done cautiously.

Fourth, although the regression model explained 48.1% of the variance in program effectiveness, the remaining 51.9% was not explained by the model, indicating that other relevant factors have yet to be incorporated.

CONCLUSION

This study aimed to analyze the effects of tutors' andragogical competence and academic climate on the effectiveness of the Paket C equivalency education program in Manado City. Multiple regression analysis of data from 187 learners showed that tutors' andragogical competence had a positive and significant effect on program effectiveness (Beta = 0.488; t = 9.059; Sig. = 0.000; H1 accepted). Academic climate also had a positive and significant effect (Beta = 0.418; t = 7.770; Sig. = 0.000; H2 accepted). Furthermore, both variables simultaneously had a significant effect, accounting for 48.1% of the variance in program effectiveness (F = 85.313; Sig. = 0.000; H3 accepted).

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These findings confirm that tutors' personal competence and learning environment factors complement each other in shaping the effectiveness of nonformal education programs, with tutors' andragogical competence making the largest relative contribution.

PKBM administrators and the Manado City Education Office are advised to prioritize the development of tutors' andragogical capacity while simultaneously strengthening a conducive academic climate. Given the cross-sectional correlational design and the study's focus on a single geographical area, the findings should be generalized cautiously. Future research is recommended to employ longitudinal or experimental designs with broader sample coverage.

DAFTAR PUSTAKA

Abdin, M., Payung Langi, J., Puturuhu, F. V., Ohorella, S. A., Nanlohy, P. A., & Abidin, Z. (2025). Analisis pengaruh iklim akademik terhadap minat belajar mahasiswa ke Politeknik Negeri Ambon. *SCHOLARS: Jurnal Sosial Humaniora dan Pendidikan, 3*(1), 17–27. https://doi.org/10.31959/js.v3i1.3571

Adu, M., & Sujarwo. (2019). Implementation of weaving training in empowering women in the industrial revolution 4.0 (Smart House Sonaf Soet Hinef Kota Kupang). International Journal of Innovation, Creativity and Change, 5(3), 290–311.

Akintolu, M., Letseka, M., & Olugbara, C. T. (2023). eLearning readiness of facilitators and learners in adult literacy programmes: A mixed-method enquiry. Journal of Educators Online, 20(3). https://doi.org/10.9743/JEO.2023.20.3.7

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall.

Bertalanffy, L. von. (1968). General system theory: Foundations, development, applications. George Braziller.

Bojāre, I., & Skrinda, A. (2016). Transformation of the system of values of autonomous learning for English acquisition in blended e-studies for adults: A holistic fractal model. Journal of Teacher Education for Sustainability, 18(2), 119–134. https://doi.org/10.1515/jtes-2016-0019

Chen, S., Fang, Y., Shi, G., Sabatini, J., Greenberg, D., Frijters, J., & Graesser, A. C. (2021). Automated disengagement tracking within an intelligent tutoring system. Frontiers in Artificial Intelligence, 3, Article 595627. https://doi.org/10.3389/frai.2020.595627

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Czahajda, R., Čairović, N., & Černko, M. (2022). Live online education efficiency mediators from the Actor Network Theory perspective. Frontiers in Education, 7, Article 859783. https://doi.org/10.3389/feduc.2022.859783

Deshpande, A., Desrochers, A., Ksoll, C., & Shonchoy, A. S. (2017). The impact of a computer-based adult literacy program on literacy and numeracy: Evidence from India. World Development, 96, 451–473. https://doi.org/10.1016/j.worlddev.2017.03.029

Djibu, R., Shofwan, I., & Umanailo, M. C. B. (2019). Development of andragogical learning model to improve life skill for teenagers who drop out of school in Gorontalo city. International Journal of Scientific & Technology Research, 8(11), 2534–2542.

Handrianto, C., Muryanti, E., Sandra, R. P., Kenedy, A. K., & Rasool, S. (2025). Development and effectiveness of smart learning systems for life skills education in nonformal settings: A mixed-methods study. International Journal of Interdisciplinary Educational Studies, 20(4), 163–188. https://doi.org/10.18848/2327-011X/CGP/v20i04/163-188

Hollander, J., Sabatini, J., Graesser, A., Greenberg, D., O'Reilly, T., & Frijters, J. (2023). Importance of learner characteristics in intelligent tutoring for adult literacy. Discourse Processes, 60(4–5), 397–409. https://doi.org/10.1080/0163853X.2023.2203543

Hoy, W. K., & Miskel, C. G. (2013). Educational administration: Theory, research, and practice (9th ed.). McGraw-Hill.

Knowles, M. S. (1980). The modern practice of adult education: From pedagogy to andragogy (2nd ed.). Cambridge Adult Education.

Knowles, M. S., Holton, E. F., III, & Swanson, R. A. (2015). The adult learner: The definitive classic in adult education and human resource development (8th ed.). Routledge.

Kruszelnicki, W. (2020). Self-directedness and the question of autonomy: From counterfeit education to critical and transformative adult learning. Studies in Philosophy and Education, 39(2), 187–203. https://doi.org/10.1007/s11217-019-09697-6

Kuo, Y.-C., & Belland, B. R. (2016). An exploratory study of adult learners' perceptions of online learning: Minority students in continuing education. Educational Technology Research and Development, 64(4), 661–680. https://doi.org/10.1007/s11423-016-9442-9

Lang, S. (2026). Adult literacy in Cambodia: Examining teachers' practices from adult learning perspectives and their effects on learners' willingness to continue learning. Journal of

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Adult and Continuing Education. Advance online publication. https://doi.org/10.1177/14779714261454216

Li, J., Kay, R., & Markovich, L. (2018). Student attitudes toward blended learning in adult literacy and basic skills college programs. Canadian Journal of Learning and Technology, 44(2). https://doi.org/10.21432/cjlt27573

Mayombe, C. (2020). Adult learners' perception on the use of constructivist principles in teaching and learning in non-formal education centres in South Africa. International Journal of Lifelong Education, 39(4), 402–418. https://doi.org/10.1080/02601370.2020.1796834

Moos, R. H. (1979). Evaluating educational environments: Procedures, measures, findings, and policy implications. Jossey-Bass.

Nedungadi, P., Devenport, K., Sutcliffe, R., & Raman, R. (2023). Towards a digital learning ecology to address the grand challenge in adult literacy. Interactive Learning Environments, 31(1), 383–396. https://doi.org/10.1080/10494820.2020.1789668

Nurvallah, B., & Sunarti, V. (2026). Pengaruh iklim dan minat belajar terhadap hasil belajar IPA warga belajar Paket B di PKBM Sentosa Hati. Didaktika: Jurnal Kependidikan, 15(3), 3999–4014. https://doi.org/10.58230/27454312.5036

Radiopoulou, D., Kantaros, A., Ganetsos, T., & Zacharia, P. (2025). 3D printing as a multimodal STEM learning technology: A survey study in second chance schools. Multimodal Technologies and Interaction, 9(9), Article 87. https://doi.org/10.3390/mti9090087

Radiopoulou, D., Vavougios, D., & Zacharia, P. (2026). Integrating digital technologies into STEM physics for adult learners: A comparative study in second chance schools. Computers, 15(2), Article 94. https://doi.org/10.3390/computers15020094

Republik Indonesia. (2005). Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 tentang Guru dan Dosen.

Sichula, N. K., & Genis, G. (2019). Pedagogical practices in non-formal adult literacy classes in Zambia. International Review of Education, 65(6), 879–903. https://doi.org/10.1007/s11159-019-09808-y

Spencer, L. M., & Spencer, S. M. (1993). Competence at work: Models for superior performance. Wiley.

Stufflebeam, D. L. (2003). The CIPP model for evaluation. In T. Kellaghan & D. L. Stufflebeam (Eds.), International handbook of educational evaluation (pp. 31–62). Kluwer Academic Publishers. https://doi.org/10.1007/978-94-010-0309-4_4

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Stufflebeam, D. L., & Coryn, C. L. S. (2014). Evaluation theory, models, and applications (2nd ed.). Jossey-Bass.

Sunarti, V., Jamaris, J., Solfema, S., Iswari, M., Hidayati, A., Handrianto, C., & Rahman, M. A. (2024). Evaluating the effectiveness of a blended learning system for developing technological andragogical content knowledge (TACK) in community educators. Encontros Bibli, 29, Article e96419. https://doi.org/10.5007/1518-2924.2024.e96419

Tagiuri, R., & Litwin, G. H. (Eds.). (1968). Organizational climate: Explorations of a concept. Division of Research, Graduate School of Business Administration, Harvard University.

Tomczyk, Ł., Mróz, A., Potyrała, K., & Wnęk-Gozdek, J. (2022). Digital inclusion from the perspective of teachers of older adults – expectations, experiences, challenges and supporting measures. Gerontology & Geriatrics Education, 43(1), 132–147. https://doi.org/10.1080/02701960.2020.1824913

Torres Mata, I. D. C., Miranda Becerra, J. N., & Vázquez-Villegas, P. (2025). Exploring the impact of a training program for continuing education facilitators—An empirical journey. Frontiers in Education, 10, Article 1601508. https://doi.org/10.3389/feduc.2025.1601508

Tur, G., de Benito, B., Arnab, S., Castañeda, L., Lameras, P., Bedenlier, S., & Wasson, B. (2025). Data literacy for citizenry through game-based learning: Adult perceptions of fun and learning with the DALI Toolkit. First Monday, 30(9). https://doi.org/10.5210/fm.v30i9.13792

Uribe, J. (2026). Inequalities and pedagogical mediations in virtual continuing education: A critical analysis from a digital justice perspective. Multidisciplinary Journal of Educational Research, 16(1), 25–45. https://doi.org/10.17583/remie.17940

Yang, H.-F. (2019). Instructional strategies and learning achievement of nonformal curricula in Taiwan. Contemporary Educational Research Quarterly, 27(1), 79–112. https://doi.org/10.6151/CERQ.201903_27(1).0003

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