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Article

The impact of facilitation competence of instructors on learning immersion and learning achievement—Focusing on adult learners

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Abstract: This study explored how facilitation skills—defined as instructional techniques that accurately convey core messages in a trusting relationship and encourage self-directed learning participation among adult learners—affect the effectiveness of learning. The research focused on adult learners enrolled in lifelong education programs at seven universities, including general and vocational colleges in Busan. It aimed to examine the relationships between instructors' facilitation skills, learner engagement, and learning outcomes, as well as the mediating effect of engagement on these relationships. A total of 213 valid survey responses were analyzed from an initial 215 responses, excluding 2 unsuitable entries. The findings are summarized as follows. First, facilitation skills were found to partially influence learner engagement. Second, learner engagement was shown to affect learning outcomes. Third, facilitation skills were found to have a partial effect on learning outcomes. Fourth, learner engagement partially mediated the relationship between facilitation skills and learning outcomes. Based on these results, this study is expected to contribute to a deeper understanding of the relationship between facilitation skills and learning outcomes in adult learners, providing practical guidelines for enhancing effectiveness in various educational contexts.

Keywords: adult learners; facilitation skills; learning engagement; learning outcomes

1. Introduction

Lifelong learning not only significantly contributes to improving the quality of life at the individual level through various learning experiences throughout one's life but is also recognized at the national level as an essential method for effectively utilizing human resources through systematic lifelong education policies (Korea Educational Development Institute, 2016). According to Statistics Korea, the lifelong learning participation rate (formal and non-formal) among Korean adults aged 25 to 79 was 32.3% in 2023, indicating that 3 out of 10 adults in this age group engaged in lifelong learning during 2022 (Statistics Korea, 2023).

As the learning needs of adult learners, who actively pursue lifelong learning beyond formal education, continue to grow, efforts to meet these needs have become increasingly important (Jeong, 2011). To sustain proactive learning, instructional methods must go beyond traditional lecture formats. They should embrace change and innovative approaches, shifting from one-way instruction to a participatory and interactive process where learners experience and internalize their learning.

American psychologist Rogers (1969) asserted that "we cannot teach another person directly; we can only facilitate their learning," emphasizing the importance of active learner participation. He highlighted that educators must possess facilitation

competency to promote such learning. Facilitation competency refers to the process and activities that promote learning in various ways, helping learners achieve agreed-upon learning goals through active engagement. Lifelong educators play the role of facilitators, maintaining a neutral stance and fostering open interaction with learners, thereby helping them embrace new concepts, expand their capabilities, and achieve their desired goals (Han and Lee, 2021).

When educators effectively utilize their facilitation competencies, trust within the group increases, and they play a vital role in promoting self-directed and effective group processes in learning environments (Pierce et al., 2000). This competency also enhances individual autonomy and stimulates the organization as a whole, fostering the generation of high-quality ideas (Kimitoshi Hori, 2005). Therefore, managing, planning, and facilitating complex elements in the learning process underscores the importance of facilitation competency.

Previous studies consistently emphasize learner participation and efforts to connect participants' actual needs with their learning experiences. Research by Lee and Jeong (2021) concluded that the facilitation competency of organizational leaders is a critical factor determining team effectiveness through member collaboration. Similarly, Park (2021) found that higher facilitation competency in lifelong educators enhances adult learners' sense of learning presence, problem-solving abilities, and critical thinking tendencies.

The most crucial aspect of facilitation competency lies in the relationship and attitude between educators and learners. The core perspective is that learning environments should go beyond merely imparting knowledge; they should promote self-directed learning behaviors in learners (Baek and Lim, 2021). Educators must utilize their facilitation competencies to design and deliver education, guiding learners to open their minds and fully engage in the learning process. This approach is expected to lead to enjoyable and practical learning experiences, ultimately yielding positive educational outcomes.

Therefore, this study aims to examine how facilitation competency, as a teaching technique that accurately conveys core messages within a relationship of mutual trust and designs education based on adult learners' active participation, impacts learning effectiveness. Additionally, it seeks to identify the mediating effect of learning engagement within the learning process. The findings of this study will confirm the importance of enhancing facilitation competency when designing or improving adult learning programs. By clarifying the role and significance of facilitation in adult learning environments, the study aims to develop effective teaching methods that maximize learners' engagement and learning outcomes.

2. Literature review

2.1. Adult learners

Knowles (1980) defined an adult learner as someone who, based on their autonomy, is capable of thinking and acting independently, leading their own life, and fulfilling social roles responsibly. An adult learner is a person between the ages of 25 and 79 who continuously learns in order to become a complete individual. Such

learners participate in educational activities by selecting programs offered by lifelong education institutions to meet their learning needs (Kwon, 2018).

2.2. Facilitation competence

Rogers (1969) emphasized the importance of treating learners sincerely, expressing acceptance, and demonstrating empathy and understanding as essential abilities for facilitation competence. He also highlighted a person-centered, humanistic philosophy as the essence of facilitation. Facilitation competence in an instructor involves encouraging and supporting learners through questions, accelerating learning, trying various approaches, providing feedback to help learners become more aware of their actions, reflecting on problem-solving processes, and promoting learning (Park, 2024). Choi and Lyu (2021) explained the three components of facilitation competence in the educational domain: promoting learning activities, fostering creative thinking, and facilitating empathetic communication.

- Promoting Learning Activities: Instructors help lifelong learners stay focused on the learning objectives, enabling them to immerse themselves in learning activities.
- Fostering Creative Thinking: Instructors encourage learners to explore diverse methods when solving problems or completing tasks, allowing them to observe and think about things from various perspectives, leading to the generation of new ideas.
- Empathetic Communication: Instructors listen attentively to learners, summarizing and organizing key points to understand not only the content but also the emotions of the learners.

2.3. Learning engagement

Csikszentmihalyi (1990) defined engagement as a state in which individuals are completely immersed in their current learning, performing optimally, and fully concentrating on their actions, experiencing a natural, effortless flow. He suggested that this state can be observed when learners are fully engaged in learning activities, exhibiting creativity and enjoyment in the moment. Steele and Fullagar (2009) defined learning engagement as the deepening of learners' involvement in various learning activities over time. Kwon (2023) described it as a psychological state where learners, focused on their learning goals, concentrate on their current learning tasks and challenges, losing awareness of time and their surroundings while experiencing fun and enjoyment.

2.4. Learning outcomes

Mayer (1982) defined learning outcomes from an experiential perspective as the relatively lasting changes in the attitudes, knowledge, and behaviors of individuals recognized as adults in society. Ewell (1985) described learning outcomes as the process of change in learners' problem-solving abilities, knowledge, and sense of participation, as a result of experiences gained through a period of learning. Learning outcomes are also defined as the tangible benefits, knowledge, skills, desirable

changes, improved quality of life, and the enjoyment learners gain from participating in a learning program (Park, 2024).

3. Methodology

3.1. Research hypothesis

Based on previous studies, this research aims to investigate the relationships between facilitation competence, learning engagement, and learning outcomes in adult learners participating in lifelong education programs. The following research hypotheses were established, and a research model (**Figure 1**) was proposed:

H1. Facilitation competence will have a positive (+) effect on learning engagement.

H2. Learning engagement will have a positive (+) effect on learning outcomes.

H3. Facilitation competence will have a positive (+) effect on learning outcomes.

H4. Learning engagement will mediate the relationship between facilitation competence and learning outcomes.

3.2. Research model

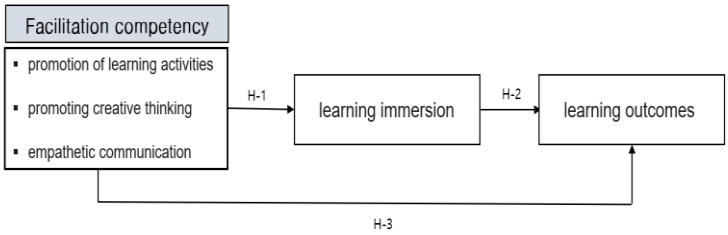

Figure 1. Research model.

3.3. Research participants and data collection

This study targeted adult learners participating in lifelong education programs at seven universities and community colleges in the Busan region. The survey period lasted 30 days, from 1 May to 30 May 2024. Survey participants were given a brief explanation, including the purpose of the study, and then responded either via self-administered or Google online questionnaires. A total of 215 responses were collected, but 2 were excluded due to insincere answers, leaving 213 responses for analysis.

3.4. Composition of measurement tools

The survey items used in this study's measurement tools employed nominal scales for general characteristics and a total of 32 items using a 5-point Likert scale. General characteristics included 4 items. Facilitation competence was based on Choi and Lyu's (2021) study, which was revised and supplemented to include 15 items: 5 items for promoting learning activities, 4 items for fostering creative thinking, and 5 items for empathetic communication. Learning engagement was restructured as a single factor with 5 items, based on Kwon's (2023) study. Learning outcomes were also restructured as a single factor with 5 items, based on You's (2020) study.

3.5. Data analysis

The collected data underwent coding and data cleaning and were processed using SPSS 28.0 statistical package. The analysis methods are as follows: frequency analysis was conducted for general characteristics of the participants, factor analysis and reliability tests were used for validity and reliability of facilitation competence, learning engagement, and learning outcomes. Correlation analysis was conducted to examine the relationships between variables, and linear regression analysis was used to test the hypotheses. To examine the mediating effect of learning engagement, a three-step mediation regression analysis was performed. The mediation regression analysis was based on Baron and Kenny's (1986) three conditions.

(1) In regression equation ① $M = \alpha 1 + \beta 1X1$, the independent variable must have a statistically significant effect on the mediating variable.

(2) In regression equation ② $Y = \alpha 2 + \beta 2X1$, the independent variable must have a statistically significant effect on the dependent variable.

(3) In regression equation ③ $Y = \alpha 3 + \beta 3X1 + \beta 4M$, the mediating variable must have a statistically significant effect on the dependent variable.

4. Result and discussion

4.1. General characteristics of survey subjects

Table 1. Sample descriptive.

Characteristics		***N***	**%**
gender	male	74	34.7
	female	139	65.3
Age of firm	20's	14	6.6
	30's	93	43.7
	40's	81	38.1
	Over 50s	25	11.7
Education	high school graduation	73	34.3
	Graduated from junior college	64	30.0
	University graduate or higher	76	35.7
job	professional	71	33.3
	general job	104	48.8
	housewife	24	11.3
	inoccupation	14	6.6
	total	213	100.0

Table 1 shows the results of the frequency analysis for the general characteristics of the survey participants. Out of a total of 213 respondents, 139 were female (65.3%) and 74 were male (34.7%). The largest age group was people in their 30 s, with 93 respondents (43.7%). This was followed by those in their 40 s, with 81 respondents (38.1%), those aged 50 and older, with 25 respondents (11.7%), and those in their 20s, with 14 respondents (6.6%). In terms of education level, 73 respondents (34.3%) were high school graduates, 64 respondents (30.0%) had graduated from a community

college, and 76 respondents (35.7%) were university graduates. Regarding occupation, 104 respondents (48.8%) worked in general occupations, 71 (33.3%) were professionals, 24 (11.3%) were housewives, and 14 (6.6%) were unemployed.

4.2. Reliability analysis

Table 2 presents the results of validity and reliability analyses for the scales used in this study. The factor rotation method employed was Varimax rotation. For factor extraction, only factors with eigenvalues greater than 1.0 were extracted. The suitability of factor analysis was verified using the KMO (Kaiser-Meyer-Olkin) test for sampling adequacy and Bartlett's test of sphericity. Factor loadings, which indicate the degree of correlation between each variable and its factor, were set at a threshold of 0.4 or higher.

Table 2. Reliability results of the scales.

Constructs	Item	Indicator Loadings	EigenValue	Dispersion (%)	EigenValue	KMO
Promotion of learning activities (PL)	PL1	0.807	0.916	28.198	3.948	0.940
	PL2	0.772				
	PL3	0.737				
	PL4	0.727				
	PL5	0.637				
Empathetic communication (EC)	EC1	0.752	0.919	23.811	3.334	
	EC2	0.707				
	EC3	0.700				
	EC4	0.652				
	EC5	0.648				
Promoting creative thinking (PT)	PT1	0.789	0.867	23.656	3.312	
	PT2	0.725				
	PT3	0.723				
	PT4	0.546				
Learning immersion (LI)	LI1	0.822	0.916	37.228	3.723	0.941
	LI2	0.793				
	LI3	0.744				
	LI4	0.716				
	LI5	0.677				
Learning outcomes (LO)	LO1	0.840	0.920	38.519	3.852	
	LO2	0.798				
	LO3	0.788				
	LO4	0.763				
	LO5	0.603				

For reliability testing, Cronbach's α coefficient was used, with a value of 0.6 or above indicating acceptable reliability. To determine whether the measurement variables used in this study were appropriate for factor analysis, Bartlett's test of

sphericity and the KMO sampling adequacy test were conducted. The KMO value was found to be 0.940, approaching 1, indicating that the variables used in this study were suitable for factor analysis.

The sub-factors of facilitation competency—*learning activity facilitation*, *empathy facilitation*, and *creativity facilitation*—along with *learning engagement* and *learning outcomes*, all had factor loadings of 0.50 or higher, confirming the validity of the extracted factors. The reliability analysis of these factors showed Cronbach's α values exceeding 0.8, indicating high internal consistency.

4.3. Correlation verification

Prior to verifying the hypothesis on the causal relationship among facilitation competency, learning engagement, and learning outcomes in this study, a Pearson correlation analysis was conducted to identify the correlation and directionality between each construct, and the results are shown in **Table 3**. As a result of the analysis, the sub-factors of facilitation competency, such as learning activity promotion, creative thinking promotion, and empathic communication, showed a statistically significant positive correlation with learning engagement ($p < 0.01$). The sub-factors of facilitation competency, such as learning activity promotion, creative thinking promotion, and empathic communication, showed a statistically significant positive correlation with learning outcomes ($p < 0.01$). Learning engagement showed a statistically significant positive correlation with learning outcomes ($p < 0.01$).

Table 3. Correlation verification.

Division	Facilitation Capabilities			(4)	(5)
	(1)	(2)	(3)		
Promotion of learning activities (1)	1				
Promoting creative thinking (2)	0.638**	1			
Empathetic communication (3)	0.750**	0.746**	1		
Learning immersion (4)	0.721**	0.644**	0.820**	1	
Learning outcomes (5)	0.678**	0.616**	0.752**	0.836**	1

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

4.4. Regression findings

The results of the regression analysis for Hypothesis 1, specifically the tests for sub-hypotheses 1–1, 1–2, and 1–3, are shown in **Table 4**. The explanatory power (R^2) was found to be 69.9%, with $F = 166.230$ ($p = 0.001$), indicating statistically significant results. Both facilitation of learning activities ($\beta = 0.237$, $p < 0.001$) and empathetic communication ($\beta = 0.610$, $p < 0.001$) had a significant positive effect on learning engagement. However, promotion of creative thinking ($\beta = 0.031$, $p > 0.05$) was found to have no significant effect on learning outcomes.

These results suggest that empathetic communication and facilitation of learning activities within facilitation competence positively impact learning engagement, with empathetic communication playing a particularly influential role. This implies that when instructors understand and respect learners' emotions and thoughts, learners can study in a psychologically safe environment. Additionally, when instructors provide

diverse learning activities, learners can choose activities that suit their learning styles, leading to increased learning engagement.

However, creative thinking promotion did not influence learning engagement. Several factors could explain this, but one possible reason is that adult learners often manage busy schedules, and activities that are overly complex or time-consuming may hinder their engagement. Creative thinking activities may be perceived as challenging or difficult, which could reduce engagement.

The findings align with the research of Lee et al. (2022), which indicated that even in online education environments during COVID-19, instructors' course design had a positive influence on learners' engagement. Similarly, Lee and Jeong (2021) found that a team leader's facilitation competence had a positive effect on team members' engagement and team effectiveness, demonstrating a comparable outcome to this study.

Table 4. The impact of facilitation competency on learning flow.

Dependent Variable	Independent Variable	Non-standardized Coefficient		Standardized Coefficient	*t*	*p*	Collinearity Statistics	
		B	**S.E**	***β***			**Tolerance**	**VIF**
Learning immersion	(Constant)	−0.202	0.201		−1.006	0.316		
	Promotion of learning activities	0.266	0.064	0.237	4.121***	0.001	0.424	2.360
	Promoting creative thinking	0.038	0.070	0.031	0.547	0.585	0.430	2.326
	Empathetic communication	0.700	0.075	0.610	9.311***	0.001	0.473	2.115
R^2 = 0.699, adj R^2 = 0.695, F = 166.230 p = 0.001								

*p < 0.05, **p < 0.01, ***p < 0.001.

The regression analysis results for Hypothesis 2 are shown in **Table 5.** The explanatory power (R^2) was 83.6%, and F = 238,528 (p = 0.001), which was statistically significant. Learning immersion (β = 0.728, p < 0.001) was found to have a significant positive effect on learning performance. These results are interpreted as indicating that learners efficiently understand and apply learning content by using strategies that fit their learning style, and that adult learners have the ability to design and implement learning according to their own needs and purposes, and thus have higher performance in the learning process.

Table 5. The impact of learning flow on learning outcomes.

Dependent Variable	Independent Variable	Non-standardized Coefficient		Standardized Coefficient	*t*	*p*
		B	**S.E**	***β***		
Learning outcomes	(Constant)	0.623	0.145		4.312	0.001
	Learning immersion	0.837	0.037	0.836	22.473***	0.001
R^2 = 0.531, adj R^2 = 0.528 F = 238.528 p = 0.001						

*p < 0.05, **p < 0.01, ***p < 0.001.

The regression analysis results for Hypothesis 3, specifically for sub-hypotheses 3-1, 3-2, and 3-3, are shown in **Table 6**. The explanatory power (R^2) was 59.8%, and F = 106.641 (p = 0.001), indicating statistically significant results. Both facilitation of

learning activities (β = 0.246, p < 0.001) and empathetic communication (β = 0.293, p < 0.001) had a significant positive effect on learning outcomes. However, promotion of creative thinking (β = 0.508, p > 0.05) did not have a significant impact.

These findings suggest that when there is empathetic communication between adult learners and facilitators, learners feel that their experiences and emotions are respected, which strengthens their intrinsic motivation and leads to deeper learning engagement and improved learning outcomes. Additionally, when facilitators effectively promote learning activities, adult learners transform from passive receivers to active participants, which enhances their understanding and ability to apply knowledge, ultimately improving learning outcomes.

However, it was found that promotion of creative thinking did not influence learning outcomes. One possible explanation for this is that adult learners often have limited time for learning and frequently seek practical, immediate results. If activities promoting creative thinking are time-consuming or do not seem directly linked to practical outcomes, learners may be less likely to fully engage in them, which could explain why creative thinking promotion does not lead to improved learning outcomes.

This finding is consistent with Park's (2021) study, which confirmed that facilitators' competencies in lifelong education influenced adult learners' sense of learning presence, problem-solving abilities, and creative thinking promotion. Similarly, Han's (2017) research on the relationship between facilitators' competencies and adult learners' critical thinking disposition showed that sub-factors of facilitation, such as facilitation of learning activities, promotion of creative thinking, and empathetic communication, had a positive correlation with critical thinking disposition, supporting the results of this study.

Table 6. The impact of facilitation competency on learning outcomes.

Dependent Variable	**Independent Variable**	**Non-standardized Coefficient**		**Standardized Coefficient**	***t***	***p***	**Collinearity Statistics**	
		B	**S.E**	***β***			**Tolerance**	**VIF**
Learning outcomes	(Constant)	0.015	0.232		0.064	0.949		
	Promotion of learning activities	0.276	0.074	0.246	3.702***	0.001	0.424	20.360
	Promoting creative thinking	0.098	0.081	0.080	1.214	0.226	0.430	2.326
	Learning outcomes	0.575	0.087	0.508	6.615***	0.001	.315	3.155
R^2 = 0.598, adj R^2 = 0.592, F = 106.641 p = 0.001								

*p < 0.05, **p < 0.01, ***p < 0.001.

The results of the mediation effect analysis for Hypothesis 4 are shown in **Table 7**. First, in the first step, the independent variable, facilitation competence, had a significant positive effect on the mediating variable, learning engagement, meeting the condition for mediation (β = 0.813, p < 0.001). In the second step, the independent variable, facilitation competence, also had a significant positive effect on the dependent variable, learning outcomes, satisfying the mediation condition (β = 0.760, p < 0.001). In the third step, the regression coefficient of the independent variable, facilitation competence, on the dependent variable, learning outcomes, decreased compared to the second step but remained significant (β = 0.760, p < 0.001 → β = 0.238, p < 0.05). Additionally, the mediating variable, learning engagement, was also

significant (β = 0.643, p < 0.001), indicating that learning engagement partially mediates the relationship between facilitation competence and learning outcomes.

This suggests that learners who are more engaged in their learning tend to participate more consistently in the learning process, deepen their understanding of the material, and enhance their ability to apply it to real-life situations. As a result, their learning outcomes are directly improved. When facilitators effectively promote learning engagement through competent facilitation, learners become more immersed in the content, increasing the likelihood of achieving higher performance.

Moon (2021) found that higher levels of interaction between learners and instructors lead to increased learning engagement, which, in turn, positively affects academic achievement and class satisfaction. Similarly, Park et al. (2022) demonstrated that in corporate flipped learning environments, learning engagement plays a partial mediating role in the relationship between perceived teaching behavior and learning transfer. These findings align with the results of this study, which indicate that learners' engagement significantly impacts learning achievement.

Table 7. The mediating effect of learning flow on facilitation competency and learning outcomes.

Step	Dependent Variable	Independent Variable	Non-standardized Coefficient		Standardized Coefficient	*t*	*p*
			B	**S.E**	β		
1	Learning immersion	(Constant)	−0.419	0.207		−2.022	0.044
		Facilitation Capabilities	1.045	0.051	0.813	20.554***	0.001
		R^2 = 0.660 Adj.R^2 = 0.659, F-value = 422.053***, p = 0.001					
2	Learning outcomes	(Constant)	−0.144	0.231		−0.622	0.535
		Facilitation Capabilities	0.978	0.057	0.760	17.248***	0.001
		R^2 = 0.578, Adj.R^2 = 0.576, F-value = 297.485***, p = 0.001					
3	Learning outcomes	(Constant)	−0.126	0.191		−0.660	0.510
		Facilitation Capabilities	0.306	0.080	0.238	3.839***	0.001
		Learning immersion	0.643	0.062	0.643	10.384***	0.001
		R^2 = 0.614, Adj.R^2 = 0.610, F-value = 166.948***, p = 0.001					

*p < 0.05, **p < 0.01, ***p < 0.001.

5. Conclusion

This study aimed to empirically investigate the impact of facilitators' competencies on adult learners' learning outcomes and the mediating effect of learning engagement among adult learners participating in lifelong education programs at seven universities and colleges in Busan. A total of 215 questionnaires were collected, with 213 valid responses used for analysis after excluding 2 incomplete responses. Data analysis included frequency analysis for general characteristics, factor analysis for the validity and reliability of facilitation competencies, learning engagement, and learning outcomes, and correlation analysis to understand relationships between variables. Hypotheses were tested using regression analysis, and the mediating effect of learning engagement was analyzed using a three-step mediation regression.

Fist, Facilitation Competence and Learning Engagement Facilitation competence was found to have a partial positive effect on learning engagement. Specifically,

empathic communication and **learning activity facilitation** significantly influenced learning engagement, while **creative thinking facilitation** did not. The results suggest that empathic communication strengthens emotional connections between learners and facilitators, increasing learners' immersion in learning. Facilitators who employ diverse strategies and tools to make the learning process engaging and challenging play a crucial role in enhancing learners' focus and engagement. However, creative thinking facilitation may not significantly affect learning engagement because adult learners, who often have prior experiences and knowledge, may not find creative approaches as transformative or engaging.

Second, learning engagement had a significant positive effect on learning outcomes. This highlights the role of facilitators not only in knowledge transmission but also in creating an environment where learners can immerse themselves in the learning process, actively participating and achieving better learning outcomes as a result.

Third, Facilitation competence was also found to have a partial positive effect on learning outcomes. Empathic communication and learning activity facilitation contributed positively to learning outcomes, but creative thinking facilitation did not. The trust and positive learning environment fostered through empathic communication help learners persist in their studies, even when facing challenges, resulting in better outcomes. Additionally, when facilitators effectively promote learning activities, learners shift from passive to active participants, experiencing improved understanding and achievement, which translates into better learning outcomes. However, creative thinking facilitation might have a limited effect on learning outcomes, as highly structured or autonomy-limiting approaches may hinder learners' performance.

Fourth, learning engagement was found to partially mediate the relationship between facilitation competence and learning outcomes. This indicates that learning engagement serves as a crucial link, whereby effective facilitation that promotes engagement leads to improved learning outcomes. The results show that when facilitators successfully foster learning engagement, learners are more likely to immerse themselves in the content, enhancing their performance.

The hypothesis that facilitation competence would positively impact adult learners' learning outcomes was partially supported. Empathic communication and learning activity facilitation significantly influenced learning outcomes, but creative thinking facilitation did not. These results suggest that enhancing facilitation competence, creating learner-centered approaches, providing appropriate learning environments, offering diverse learning activities, and respecting cultural diversity are key factors in improving adult learners' engagement and performance. By designing and implementing learning environments and activities that consider these elements, adult learners' engagement and outcomes can be maximized.

Based on these conclusions, the following suggestions are made for follow-up research considering the limitations of the study.

First, this study was limited to adult learners participating in lifelong learning programs in Busan, with a gender imbalance (65% female). The findings cannot be generalized without considering the limitations of the sample. Future research should address gender balance, geographic diversity, and a variety of learning environments.

Second, while this study focused on learning engagement as the primary mediator between facilitation competence and learning outcomes, future research could explore other variables influencing learning outcomes. Additionally, qualitative research methods (e.g., in-depth interviews, case studies) could provide deeper insights into the real-life effects of facilitation and the importance of facilitators' competencies from the learners' perspectives.

These recommendations are expected to deepen the understanding of the relationship between facilitation competence and adult learners' outcomes and offer practical guidance for improving facilitation in various educational settings.

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