

Text Mining Study on the Meaning and Needs of Adults' Participation in University Learning Communities

Namsoon Kim¹, Yonghwan Bang², Kyunghee Park³

¹Ph.D. Candidate, Department of Education, Chungnam National University, Korea (tgnskim@gmail.com), First Author

²Special Appointment Professor, Konyang University, Korea (yonghwan.bang@gmail.com), Co-Author

³Assistant Professor, Department of Education, Woosuk University, Korea (khpark01@hanmail.net), Corresponding Author

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ABSTRACT

This study empirically analyzed the needs of adults for university learning communities and explored the significance of their experiences in such activities. To this end, a survey was conducted with students from two universities with specialized colleges for adult learners, and data from 119 respondents were analyzed for differences. The results of the analysis showed that adult learners who work and study at the same time had a statistically significant higher awareness of community activities within universities, but the willingness of all respondents to participate in learning communities was relatively low. Next, keyword analysis using text mining techniques was conducted on the *Collection of Best Practices of University Lifelong Education* published by the National Institute for Lifelong Education from 2019 to 2022. The analysis revealed high occurrence frequencies of terms such as 'book', 'major', 'vacation', 'certificate', 'goal', and 'sharing', while the word network showed strong connections between 'major', 'certificate', 'book', and 'we'. Based on this, it was confirmed that adult learners' participation in university learning communities can lead to not only academic achievement but also positive perceptions of university life. However, it was found that the employment status of adult learners can act as a barrier to participation in learning communities. This suggests that universities need to prepare customized learning community operation and support plans according to the characteristics of adult learners.

1. Introduction

University lifelong education, which had been at the level of providing non-degree courses, liberal arts education, and leisure education, began to establish itself as an important function of university education in the mid-2000s as the operation of degree courses through the reorganization of the

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higher education system began in earnest (Yang, 2019). Since then, the flow of university lifelong education policy has shifted toward reorganizing the overall structure of university operations in an adult-friendly manner (Yang, 2020). In addition, as the social demand for reeducation at the higher education level increases, adult learners' participation in higher education is expected to become more active (Lee, Lee, & Woo, 2024).

However, adults who have entered university after school age complain of various difficulties due to academic gaps in their participation in university education despite policy support from the state and universities. These characteristics of adult learners are a decisive factor that influences their intention to drop out (Ahn, 2021). At this time, adult learners' diverse learning experiences and interactions with many people within the university have a positive effect on lowering their intention to drop out and continue to learn (Ahn, 2021).

In particular, a learning community network that helps establish a foundation for sharing information necessary for learning and thinking about how to structure life after graduating from university is one of the learning activities that adult learners in universities consider important. It was found that adult learners' satisfaction with school, academic success, and meaningful learning experiences in university education are achieved through the learning community they have formed themselves (Jeong et al., 2015).

In order for these learning communities to operate effectively, voluntary participation and a sense of purpose for learning from adult learners are required (Lim, Lee, & Kim, 2022). Therefore, systematic support and quality management at the university level are necessary so that adult learners can maintain high self-direction and properly determine and promote the direction of operation of the learning community (Kim & Lee, 2021; Yoo, 2017). To achieve this, understanding adult learners and considering their learning characteristics are important prerequisites. Exploring the meaning of participation through adult learners' needs and activity experiences regarding learning communities can be a starting point. Therefore, this study aimed to empirically analyze the meaning and needs of adults attending university to obtain a degree by participating in a learning community.

To this end, first, a survey was conducted targeting adults currently attending university to confirm the needs for a learning community. Second, the case analysis method was used to explore the meaning of a learning community perceived by adult learners who experienced learning community activities. These research results are expected to provide meaningful implications for universities to understand adult learners and establish adult-friendly educational service support measures including learning communities.

2. Literature Review

2.1 Learning characteristics of university adult learners

Adult learners enter university with a rich history acquired through various daily experiences, from formal school education experiences to family, work, and community members (Park, Park, & Ahn, 2023; Donaldson & Graham, 1999). They connect experiential knowledge with existing

learning and integrate it into new learning (Donaldson & Graham, 1999). Adult learners are generally autonomous and self-directed, and they actively explore the necessity, purpose, and method of learning (Park, Park, & Ahn, 2023). In addition, they have strong intrinsic learning motivation, value tasks related to life, and pursue problem-centered learning in a practical aspect (Kim & Lee, 2021; Knowles, 1989). Adult learners who participate in college classes tend to place greater emphasis on the qualitative and cognitive aspects of education (Kasworm & Blowers, 1994).

On the other hand, adult learners who enter college exhibit differences in learning outcomes depending on their personal backgrounds and characteristics, such as gender, age, and economic status (Park, Park, & Ahn, 2023). Cross (1981) stated that adult learners may experience learning difficulties due to dispositional barriers such as personal attitudes, expectations, and self-esteem, situational barriers such as family support for learning and past educational experiences, and institutional barriers such as a lack of diversity in content, learning content, or educational environments. Ha (2019) cited obstacles to adapting to academic life, obstacles to participating in lectures, obstacles to concentrating on studying, and obstacles to external support as factors that continuously have a negative impact on adult learners experiencing college life. In particular, studies have reported that adult learners perceive a lack of learning know-how and the burden of completing assignments as learning obstacles (Hyun & Shin, 2011).

Accordingly, Park, Park, & Ahn (2023) emphasized the need to operate customized education programs that reflect the various learning needs and goals of adult learners. Kim et al. (2022) also confirmed that for a university's lifelong education system to be successfully established, a multifaceted understanding of adult learners' needs for learning in nature and needs for practical purposes must come first. Bae & Kim (2022) emphasized that for universities to substantively implement an adult-friendly education system, support is necessary to diagnose the insufficient basic academic skills and level of prior learning of each adult learner and to successfully resolve various obstacles encountered during the course of classes.

2.2 The concept of learning community and the effect of participation

Shrivastava (1999) defined the concept of learning community as a group of learners who participate in joint inquiry activities, improve their individual knowledge, and promote the application of that knowledge, emphasizing the growth of individual knowledge through group activities.

On the other hand, Kang & Lim (2002) defined it as a learning culture in which individuals with a common learning purpose interact to share and create knowledge and experiences, and individuals and the community grow simultaneously, highlighting the learning community as a culture in which members share not only their knowledge but also their experiences and grow together through interaction. In addition, Yoo (2005) defined learning community as an activity in which members create knowledge and apply it back to the field through sharing the insights and experiences they have acquired in the learning process, emphasizing the voluntary participation of members. In addition, there are various conceptual definitions, such as a study that defined a learning community as a learning activity in which members with similar interests interact with each other and proceed with a plan on a specific topic (Yoo, 2016) and a study that defined it as a voluntary team formation

of people with common interests and the development of cooperative learning activities on a specific topic (Yoo, 2017).

Through these conceptual definitions, the characteristics of a learning community can be derived as common learning purposes, sharing of knowledge and experience, a learning culture of joint growth, spontaneity, cooperation, creation of new knowledge, and field application activities.

Table 1. Research results on the effects of participation in learning communities

Key Research Findings		Prior research
improving academic achievement of college students		Kim (2016), Yang (2019), Yeom et al. (2012), Jang & Kim (2013), Jeong et al. (2015), Hwang (2020)
Competency Improvement	Improving Learner Core Competencies	Kim & Seo (2020), Yang et al. (2018)
	Improving self-directed learning	Kim, Jeong, & Jang (2015), Park (2015), Lee & Park (2019), Choi & Kim (2019)
	Improve communication skills	Kim (2016), Yoo et al. (2015), Jeong et al. (2015), Jo (2020)
	Improving cooperative learning ability	Jo (2020)
	Improving problem-solving skills	Park (2015), Yu et al. (2015)
Increased satisfaction with school life		Park (2018), Park et al. (2015), Yeom et al. (2012), Jeong et al. (2015)

* Source: Reconstructed by researchers, citing Lim, Lee, & Kim (2022).

In addition, regarding the effect of participation in university learning communities, Im, Lee, & Kim (2022) confirmed that participation has a positive effect on improving academic achievement, learner competency, and school life satisfaction. If we synthesize various previous studies related to this, the effect of participation in learning communities can be largely structured into three categories: improved academic achievement, improved competency, and increased satisfaction with school life, as shown in Table 1.

In this way, university learning communities can improve self-management, empathy, problem-solving, cooperative learning, and communication skills that can help adults successfully lead successful college lives. It can also help strengthen the basic learning abilities of adult learners to expect academic achievement in university education (Jeong et al., 2015). Lee (2007) stated that allowing learners who are not prepared for basic learning ability to register for the next level of courses is a way of lowering the quality of university education and suggested the operation of a learning community as one of the programs to enhance basic learning ability. Finally, adult learners' participation in a learning community improves their satisfaction with participation in university lifelong education (Park, 2018; Park, Jo, & Kim, 2015; Yeom, Park, & Oh, 2012; Jeong et al., 2015), thereby raising expectations for adult learners' learning outcomes and contributing to improving the quality of university lifelong education (Ahn, Park, & Go, 2021).

3. Research Method

3.1 Survey

This study conducted a survey of students in two universities with a college dedicated to adult learners to identify the needs of adult learners for participation in university learning communities. The survey was conducted online from March 13 to April 30, 2024, and 119 out of 291 students participated. The survey comprised 17 questions in three areas: adult learners' personal backgrounds, job characteristics such as employment status, and needs for participation in learning communities.

The survey results derived statistical values that can infer the statistical significance of the survey results in addition to frequency, ratio (%), and average. The differences in the characteristics of adult learners were verified through t-test and one-way ANOVAs, and statistical significance was determined based on a significance probability (p) of less than 0.05.

Table 2. Survey areas and questions

Survey category	Details	Items	
Common	Participate in a learning community	Willingness to participate, purpose of participation, desired type	3
	Personal background:	Department, Admission type, Highest level of education, Gender, Age, Residence, Number of household members, Employment status	8
Options	Job characteristics	for employed persons (job classification, career-working hours, total working period) for unemployed persons (current economic activity status, job search intention)	5
	Others	Other comments on participation in university learning communities.	1
Total	3 areas, 17 questions		

3.2 Case analysis

Next, a case analysis was conducted to explore the meaning of learning community perceived by adult learners who experienced university learning community activities. The case selection was made using the <Collection of Best Cases of Lifelong Education in University> published by the National Institute for Lifelong Education for four years from 2019 to 2022. A total of 214 adult learners participated in the collection, including 44 from four-year universities in the metropolitan area, 122 from four-year universities outside the metropolitan area, and 48 from technical colleges. The contents of the collection are diverse, including the motivation and purpose of participating in the LiFE project, school life, achievements and results, future plans, and hopes. Among these, texts related to the activities of adult learners, such as learning communities and study groups, were extracted in sentence form and analyzed.

Specifically, texts were processed into data and text mining analysis methods were used to derive contextual tendencies or commonly mentioned words that adult learners potentially emphasize. First,

a preprocessing process was performed to remove special characters and other stop words, and then the refined words were refined to fit the purpose of this study by considering similar words and synonyms. Next, the analysis results were presented based on the frequency of word occurrence, and keyword network analysis was used to visualize the analysis results so that they could be easily identified. The processed text data consisted of a total of 237 sentences and 8,623 words. Finally, we explored the main meanings of participation by focusing on participation notes containing words with high frequency of occurrence and high network connectivity.

4. Research Results

4.1 Adult learners' needs for university learning communities

First, 16.8% of the adult learners responded 'yes' and 19.3% responded 'very much so' to the willingness to participate in university learning communities, indicating that 36.1% of all respondents were willing to participate in learning communities.

The purpose of participating in learning communities was 'strengthening major competencies and expertise' with 37.2%, followed by 'expanding social life and interpersonal relationships' with 30.2%, 'acquiring employment and career information' and 'diverse experiences and school life' with 11.6% each, and 'improving basic learning competencies' with 9.3%.

The most preferred type of learning community participation was 'learning, academics, education' at 44.2%, followed by 'culture, arts' at 30.2%, 'health, sports' at 11.6%, 'religion, service' at 9.3%, and others at 4.7%.

Based on these analysis results, designing and supporting learning communities with learning, academic, and education characteristics is required, considering the need to strengthen specialized competencies and expertise and expand social life and interpersonal relationships.

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Table 3. Status of adult learners' demand for participation in university learning communities

Questionnaire Items	Response options	Frequency	Percentage
Willingness to participate	Not at all	12	10.1
	Not so much	28	23.5
	It's average	36	30.3
	Yes	20	16.8
	Yes, very much so	23	19.3
Purpose of participation	Improving basic learning skills	4	09.3
	Strengthening professional competencies and expertise	16	37.2
	Expanding social life and interpersonal relationships	13	30.2
	Obtaining employment and career information	5	11.6
	Diverse experiences and school life	5	11.6

Table 3. Cont.

Questionnaire Items	Response options	Frequency	Percentage
Participation type	Culture, Arts	13	30.2
	Religion, Service	4	09.3
	Learning, Academics, Education	19	44.2
	Health, Sports	5	11.6
	Others	2	04.7

After examining the differences in perception of university community activities by individual characteristics of adult learners, statistically significant differences were found in age and employment status. Adult learners over 40 years of age ($M=3.63$, $SD=0.865$) perceived gathering with people and activities during university life more positively than adult learners under 40 years of age ($M=3.08$, $SD=0.862$), and employed learners ($M=3.57$, $SD=0.879$) perceived it more positively than unemployed learners ($M=3.27$, $SD=0.691$).

Table 4. Differences in perception of community activities by individual characteristics of adult learners

Characteristics	Division	Cases	<i>M</i>	<i>SD</i>	<i>t/F</i>	<i>P</i>
Age	Under 40 years old	13	3.08	0.862	-2.184	.031*
	40 years old or older	106	3.63	0.865		
Highest level of education	High school graduate	65	3.57	0.901	0.001	.999
	College graduate	28	3.57	0.920		
	Graduated from a 4-year university or higher	26	3.58	0.809		
Employment Status	Employed	119	3.57	0.879	2.560	.013*
	Unemployed	30	3.27	0.691		

* $p < .05$

4.2 Meaning of participation in university learning communities

Next, in order to empirically discover the meaning of participation in a university learning community as perceived by adult learners, we identified words that appeared repeatedly in the case study collection and the networks between those words.

The words that were most mentioned in cases of adult learners' participation in university learning communities are as shown in Table 5. Excluding words that are expected to be derived normally, such as 'club', 'activity', and 'study', the word 'book' had the highest frequency of occurrence, followed by 'major', 'vacation', 'certificate', 'goal', and 'sharing'.

Based on the results of the above frequency analysis, when analyzing the network between words, it was confirmed that the network of words such as 'major', 'certificate', 'book', and 'we' appeared strongly, as shown in Figure 1.

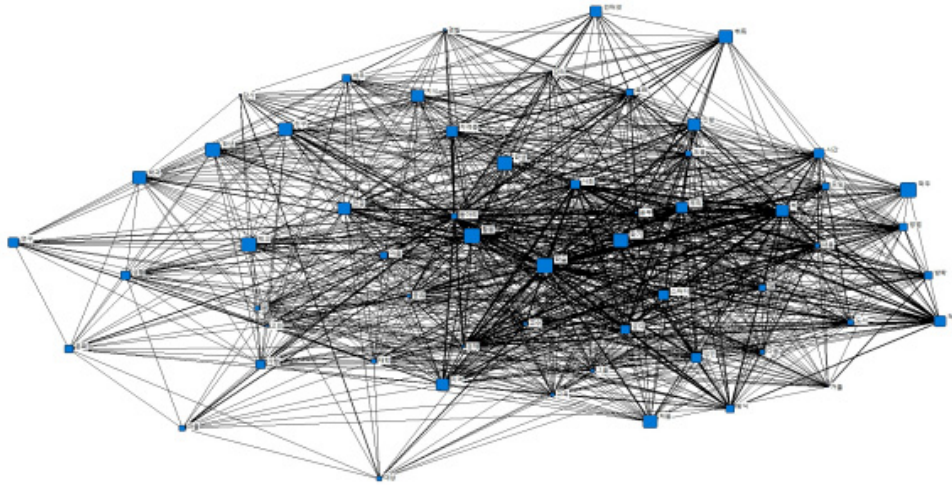


Fig. 1. Case analysis of adult learners' participation in learning communities (keyword network)

Table 5. Case analysis of adult learner learning community participation (text mining)

Word	Frequency	Word	Frequency	Word	Frequency
club	51	target	9	person	5
activity	38	region	8	worry	5
learning	36	life	8	knowledge	5
book	19	share	8	experience	5
study	17	detail	8	schoolfellow	5
we	15	university	8	village	5
thought	14	student	8	method	5
specialty	13	a lot	8	thanks	5
vacation	13	hour	8	first	5
society	12	adult	8	group	5
qualifications	11	friend	7	book	5
professor	11	progress	7	apply	5
study	11	acquisition	6	target	5
economy	10	class	6	lesson	4
help	10	dream	6	culture	4
mind	9	education	6	research	4
school	9	method	6	Internet	4

In addition, we explore specific cases of adult learners' participation in university learning communities by focusing on words with high frequency of appearance and words with strong network connectivity in the text mining results, as follows.

First, adult learners have relatively less recent learning experience than school-age college students; thus, they are burdened with major studies. Against this backdrop, the experience of reducing the burden of studying by having time to think about and discuss major studies together through learning

community activities was introduced as a major experience of college life.

While studying major studies, the reference books necessary for studying came in like a tidal wave in every class, and they were all visually thick books. At first, I was suffocated just by looking at them. I bought the reference books necessary for major classes, but at that moment, I was at a loss as to where to start reading them. At that moment, I applied for a club called 'Adult Learner Study Group' and started the club with the intention of reading them together with my peers as reference books while encouraging each other and reading them for fun. Therefore, I chose a book called *Nudge* (by Richard Thaler and Cass Sunstein) and started a study group. How can the contents of this book be approached from a social economic perspective? In the process of thinking about and organizing how to solve concerns about mutual cooperative learning among adult learners, the goal was to increase the writing learning activity capacity and form a network among peers to increase the basic learning capacity for the next semester.

As the semester or grade level goes up, I felt that the difficulty of the major is getting harder. Therefore, as a club with the goal of obtaining a qualification that can help with the major, we established a club where we study to obtain a qualification that fits our goals while participating in club activities. We studied for the qualification through media such as books and online lectures so that we could obtain the qualification through club activities and help with future employment and job changes. We operated a study club so that each club member could set their own goals and help each other achieve their goals by becoming mentors and mentees and helping each other complete the activity.

Contrary to our desire to study hard at the beginning of the semester, we encountered difficulties in studying while taking cyber lectures, writing midterm reports, and taking final exams at school events while working. We wondered what we could do and formed a study group. We decided to study together by communicating in a KakaoTalk room with 5 people from our department who were in a sync with and helping each other. The results were so good~ Now I don't have to worry about the exam~

Second, I found that participating in a learning community to achieve goals, such as obtaining qualifications and strengthening learning capacity, is an effective and meaningful experience for goal-oriented adult learners.

I established a club with the goal of obtaining qualifications that could help with my major. I studied for my qualifications through media such as books and online lectures so that I could obtain my qualifications through club activities and help with future employment and job changes. I also exchanged information with other club members through regular meetings about what they were learning.

There were so many things. I passed the skin care theory test through the skin qualification club and received support for online lectures through the entrepreneurship club, which helped me dream of starting a business. I have also gained knowledge and experience in customized cosmetics and even attended a beauty wellness forum. I am grateful for the things I would not have been able

to do if I were in society. Currently, I am working with the team members of the skin industry club, which we formed last year, to develop a pain relief cream. It is not easy. It is really difficult. But it is enjoyable. Unlike my younger, unstable self at twenty who was constantly running toward goals, I now find myself quietly and genuinely happy. Regardless of the outcome, I am enjoying the course with a grateful heart because I know well that if it weren't for our department, I would not have been able to experience it if it weren't for now.

Third, adult learners have a lifestyle that includes various activities, such as work, family life, and leisure culture, in addition to their studies; thus, it is not possible to maintain learning activities proactively through will alone even if they voluntarily choose university education. In this situation, we can see that the learning community that we participated in during the vacation is an experience that helps us spend our time more meaningfully and satisfied our desire for growth through learning.

During the last winter vacation, I participated in a club activity with friends from the same department. It was a programming language called Python. There were friends in the club who didn't know Python at all like me, and there were friends who were good at Python. The club activity was held every Sunday evening at 9 PM via ZOOM in response to the COVID-19 pandemic. We were able to build our skills by asking questions about problems we did not know, reviewing each other's code, and sharing ways to write better code.

I know how impatient I am. If I had studied Python alone during my vacation, I might have stopped. I would have repeated the same mistakes and spent days full of regrets like during the summer vacation. Through club activities, I was able to spend my winter vacation meaningfully, and it became an opportunity for me to become familiar with programming, which had always seemed difficult. Seeing how much I had grown during the vacation, I feel proud that I have taken a step closer to becoming a developer.

The most helpful thing was the program where students could form clubs and receive support to do activities they wanted to do during the vacation. I thought it was a great opportunity when I was considering obtaining job-related qualifications during my vacation. By planning and executing things with like-minded friends, I avoided wasting my vacation time, and experiencing various extra-curricular activities broadened my perspective.

Fourth, the learning community activities where we learned together were an experience that allowed me to naturally reflect on the educational views of adult learners formed through the previous modern education system.

During class, I took a lecture titled "Change your thoughts and attitudes for the third act of your life." When I was in school, studying was about winning. If it was like a game where you beat your friends or classmates to become number one, I was fascinated by the words that studying now is different, and I started studying. This is a group that shares knowledge, study methods, and search methods, and furthermore shares them with fellow students, helping all students become welfare counseling heroes.

5. Conclusion and Recommendations

University learning communities are extracurricular programs that require learners' voluntary participation and a sense of purpose for learning (Lim, Lee, & Kim, 2022). Therefore, systematic support and quality management from universities should be implemented so that learners' self-directedness is maintained high and the direction of the learning community's operation can be properly determined and promoted (Kim & Lee, 2021; Yoo, 2017).

Through this study, we were able to find out that in order for learning communities to operate effectively, understanding the characteristics and expectations of adult learners must first come first. Among the research results using the questionnaire, it was confirmed that adult learners who are working and studying at the same time ($M = 3.57$) have a more positive perception of gathering with people and engaging in activities at university than unemployed adult learners ($M = 3.27$). In addition, while the proportion of employed adult learners among all respondents was 74.8%, only 36.1% of all respondents responded positively to the intention to participate in the learning community. This can be interpreted as a result of the lack of time factor (Ministry of Education & Korea Educational Development Institute, 2023), which accounts for the largest proportion of factors in adult learners' non-participation in lifelong education. As one way to solve this problem, universities can consider operating a learning community using online platforms. This can serve as a foundation for a successful learning environment as a factor in the continuation of learning for adult learners (Bassani, 2011).

Next, the results of analyzing the cases of adult learners' participation in learning communities are as follows. Adult learners were experiencing cooperative learning through participation in learning community activities, and were finding ways to study major textbooks. They also formed study groups for qualifications related to their majors or expanded their learning through writing activities. In other words, adult learners' learning community activities were acting as a driving force for the development of their ability to organize and reconstruct learning through self-directed cooperation through learning experiences (Han, 2010). In addition, adult learners remembered their participation in learning communities as meaningful experiences through the achievement of goals such as obtaining qualifications and strengthening learning capacity. In addition, they used it as an opportunity to build the strength to support learning and satisfy their growth needs by continuing activities even during vacations. This can serve as a basis for supporting the argument that it is necessary to operate customized education programs that reflect the diverse learning needs and goals of adult learners (Park, Park, & Ahn, 2023). Supporting a customized learning community through a multifaceted understanding that takes into account the characteristics, learning needs, and purposes of adult learners will contribute to the formation of a lifelong learning culture in universities where individual adult learners, communities, and universities grow simultaneously.

In summary of the above survey and case analysis, support measures are required to activate the commonly derived effect of 'acquiring major competencies and expertise through learning communities.' Rather than alleviating the academic burden felt by adult learners through degree and non-curricular courses, it is appropriate to provide customized support considering individual characteristics and needs. This is because such academic burden is not only caused by the depth and quantitative dimensions of major knowledge, but also comprehensively affected by the psychological

characteristics and environmental conditions of each adult learner. Therefore, it is necessary to support adult learners to overcome academic burden by sharing and discussing emotional difficulties together through learning communities, and to support learners to complete university education on their own initiative by gradually understanding their majors with learners at similar levels.

This study has implications in that it identified the needs of adult learners who are freshmen in college and explored the meaning of learning community activities that adult learners actually experienced and recognized in their college life through analysis of best practices. However, it has the following limitations and would like to suggest follow-up studies. First, since the needs survey was conducted on freshmen at two universities out of 30 universities participating in the Life 2.0 project, it is difficult to interpret the results as representative of adult learners at all universities. In addition, since the needs survey was conducted in March and April, it is possible that adult learners' needs for college life were not sufficiently reflected. Second, since there is a difference in the number of cases between groups according to individual characteristics of adult learners, it is somewhat difficult to generalize the results. Finally, this study is a case analysis study using a collection of notes, so it lacks the sense of presence of the situation revealed through the researcher's observation. It is hoped that more realistic research will be conducted on adult learners who are participating in learning community activities at universities in the future to produce richer and more meaningful results.

Notes

Author Contributions

Kim: Conceptualization, Literature Review, Data collection, Formal Analysis, Writing-original draft, Writing review & editing

Bang: Visualization, Writing review & editing

Park: Supervision, Case analysis & writing, Visualization, Writing review

ORCID

Namsoon Kim : <https://orcid.org/0009-0002-8874-1294>

Yonghwan Bang : <https://orcid.org/0000-0001-9266-1057>

Kyunghye Park : <https://orcid.org/0000-0001-5949-666X>

Conflicts of Interest

The authors declare no conflict of interest.

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