Needs Analysis on Experience, Collaboration, Enquiry based Learning of College Students

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Abstract

The purpose of this study is to analyze the need of college students for experiential learning, collaborative learning, and enquiry-based learning. To achieve this goal, a survey was conducted with 308 college students. The need for experience, collaboration, and enquiry-based learning was comprehensively analyzed through t-tests, Borich needs analysis, and priority determination using The Locus for Focus model. The research findings are as follows: First, in Borich need analysis, the highest needs were identified for deep learning, self-directed learning, connecting theoretical knowledge with practical application, immersion, and application to real-life situations. Second, in The Locus for Focus model, the highest needs were found for abstract conceptualization, interest, conflict management, self-directed learning, and curiosity. In summary, since self-directed learning showed the highest priority simultaneously in Borich need analysis and The Locus for Focus model, it should be considered as the most prioritized item.

Keywords: Needs analysis, Experience based learning, Collaboraton based learning, enquiry based learning, University students.

1. INTRODUCTION

Due to the impact of the 4th Industrial Revolution and the decline in the school-age population, the speed of university innovation has accelerated, which has led to changes in various educational policies and teaching and learning methods for educational innovation in universities. In particular, it has become important to avoid the teaching method of simply memorizing and retrieving knowledge, and to consider the concept of competency from a holistic perspective that can create results and explore new alternatives by utilizing the acquired knowledge and information. As a result, classes has changed significantly. In the past, it was a form of sitting with a textbook open and passively listening to the professor's lecture, but now learning spaces have expanded infinitely, including classrooms, universities, regions, countries, and virtual worlds. In addition, due to the emergence of new ICT such as AI that can be used in learning, knowledge no longer exists quietly in textbooks but must be utilized so that learners can explore knowledge on their own and create learning outcomes.

In other words, while existing university education was professor-centered, the paradigm of education is now changing to learner-centered. The perspective of learner-centered education focuses on 'individual learners' and 'learning'. From the individual learner perspective, we pay attention to the individual learner's genetic aspects, experience, background, interests, abilities, needs, etc., and from the learning perspective, we provide the most usable methods for learning so that all learners can learn and achieve at the highest level of synchronization [1]. In other words, learner-centered education starts from the premise that learning should be meaningful to individual learners, and it is important to have practical measures on how to implement it in detail [2].

The characteristics of this learner-centered education are as follows. First of all, learner-centered education focuses on active activities rather than passive learning and emphasizes in-depth learning and understanding. In addition, the responsibility and accountability of learners has been strengthened, and autonomy must be granted to learners. Professors and learners have interdependence and mutual respect for each other, and above all, a reflective approach to the teaching and learning process is important. In light of these characteristics, the role of the professor is very important for learner-centered education to be properly practiced in the field. Learner-centered education does not mean that the role of the professor is reduced or non-existent, but the professor is in a complementary position to the learner by providing and guaranteeing a learning environment in which the learner can fully demonstrate his or her potential [2, 3].

Summarizing the characteristics of learner-centered education above, learner-centered education is based on the foundation of constructivist epistemology that emphasizes the individual and social construction of knowledge(theory of knowledge), where the learner has authority as the subject of learning(theory of the learner), and that it is a situational and individual meaning construction is a learning activity that is carried out through experiential and reflective learning in a collaborative learning environment(learning theory), and at this time, the professor plays the role of a facilitator who promotes the learner's learning activities(teacher theory). The important point here is that learner-centered education should not be approached as a new teaching method or strategy, but should be approached from the perspective of a practical 'paradigm shift in the educational environment'. Additionally, the learning principles for learner-centered education are as shown in <Table 1>. First, in the area of knowledge theory, individual meaning(knowledge) is constructed through active participation in individual experiences, and the nature of the learning content is practical and has various complex and integrated characteristics. Through this, the sense of ownership and effectiveness of learning can be strengthened through meaningful learning related to the learner's real life [2].

Table 1. Learner-centered education principles

Category		Contents
Epistemology	Individual Meaning Construction through Experience	- Construction of individual knowledge (meaning) through empirical and participatory learning
		- Respect for individual differences such as prior knowledge, interests, and background of learners
	Authentic Tasks	- Present tasks considering the context and authenticity of learning that are meaningful to learners
		- Integrated approach in content and methodology
Learning Theory	Reflective Learning	- Thinking and activities that allow discovering new perspectives and depth by reflecting on one's learning
	Self-directed Learning	- Ability needed in the era of lifelong education
		- Capability to independently lead the entire learning process

	Collaborative Learning	- Experiencing diverse perspectives through interaction with other learners and modifying, complementing, and reconstructing one's thoughts - Forming mutually trustworthy relationships with other learners
Learner Theory	Learner as the Main Agent of Learning	- Having power and responsibility for learning and leading the entire learning process - Ownership of learning
Teacher Theory	Teacher as a Catalyst/Facilitator of Learning	- Assistant and coach in learning - Forming new interdependent and collaborative relationships with learners

In the area of learning theory, there are three principles: 'reflective learning', 'self-directed learning', and 'collaborative learning'. Learning with a leading role and choice in the entire learning process means that it presupposes deep thinking, exploration, and reflective activity about one's learning content and process. And the result is not only a deeper understanding of learning, but also the effect of adding new perspectives to one's own experience [4].

By summarizing the characteristics and learning principles of learner-centered education examined above and classifying learning types, they can be divided into experiential learning, collaborative learning, and enquiry learning, and there can be project learning that combines all three types. First of all, experience-based education refers to a curriculum organized so that students learn through experience and reflect on the experience. collaboration based education is a curriculum organized to promote collaboration among learners by focusing on teaching and learning methods such as discussions, debates, and projects in which learners actively participate, so that they can learn communication and consideration among members of society. enquiry-based education is a curriculum in which learners develop and explore innovative ideas, knowledge, and creative alternatives through experiments and challenges by utilizing abundant learning resources to recognize and solve diverse and complex problems in our society. Among the elements of learning, the focus of the class may vary depending on whether experience, collaboration, or enquiry is emphasized more, but fundamentally, these three elements are the core elements of learner-centered education and form the basis of the class.

Meanwhile, the most important subject in learner-centered education is the 'learner.' This is because it is an educational activity to strengthen learners' capabilities and promote growth. Therefore, in order to properly practice learner-centered education, it must be accompanied by an accurate analysis of the learner's current level and level of need for learner-centered education. Accordingly, this study examines the perception of experience, collaboration, and enquiry based learning by learners, who are the main consumers of learner-centered education, and analyzes the difference between the need level and the current implementation level to promote experiential learning, collaborative learning, and enquiry learning. This study would like to analyze the learner's needs for to this end, the factors that learners consider in experience, collaboration, and enquiry based learning were explored, and priorities were confirmed through needs analysis. Through this, identifying the level of experience, collaboration, and enquiry based learning recognized by learners, and lay the foundation for realizing learner-centered education.

2. METHODS

2.1 Participants
This study conducted an online survey targeting 308 college students in G city to analyze learners' needs for experiential learning, collaborative learning, and enquiry based learning. The survey was conducted as an

online survey, and research subjects participated in the survey by accessing the survey link installed on the university's own system in June 2024. The responses to the survey were automatically saved in an Excel sheet, and data from 308 participants were used for analysis without any exclusions. The general characteristics of the research subjects are as shown in <Table 2>.

Table 2. General characteristics of research subjects

Category		Frequency (N)	Percentage (%)
Field	Humanities	121	39.3
	Science and Engineering	39	12.7
	Health Sciences	101	32.8
	Interdisciplinary	47	15.3
Grade	1st	120	39.0
	2nd	64	20.8
	3rd	56	18.2
	4th and above	68	22.0
Gender	Male	109	35.4
	Female	199	64.6
Total		308	100.0

2.2 Research tools

In this study, in order to analyze learners' needs for experience, collaboration, and enquiry based learning, a survey was conducted focusing on questions extracted from previous studies on experience, collaboration, and enquiry based learning, and questions derived through FGI of school members. The survey questions were set as major topics in three areas, including experience, collaboration, and enquiry based learning, and questions were selected with detailed content for each area. Based on this, content validity was verified by an expert group consisting of 4 doctorates in education, 2 education professors, and 3 teaching and learning method experts, and 21 questions were ultimately selected.

All questions used a Likert scale ranging from 1 point 'strongly disagree' to 5 point 'strongly agree' regarding 'level of need'(RCL) and 'level of implementation'(PCL). The reliability analysis showed Cronbach's alpha of .971 for the need level (RCL) and .959 for the implementation level (PCL) across all 21 questions. <Table 3> presents the reliability for each survey area.

Table 3. Content and reliability by area

Category	Contents	Items	Cronbach's a	
Experience based learning	Experiential learning that uses knowledge in real situations (Experience, reflection, abstract conceptualization, transfer, immersion, etc.)	7	RCL	.923
			PCL	.916
Collaboration	Collaborative learning with colleagues	7	RCL	.931

based learning	(Collaboration, mutual reciprocity, conflict management, contribution, respect for diversity of members, relationship formation, etc.)		PCL	.903
Enquiry based learning	Deriving innovative ideas and exploring problem solutions (In-depth learning, problem solving, self-direction, curiosity, comprehensive thinking, etc.)	7	RCL	.936
			PCL	.913
Total		21	RCL	.971
			PCL	.959

2.2 Data analysis

In this study, Cho's priority determination method was used to analyze the data. [5] went beyond simply conducting a t-test or priority analysis to conduct systematic and detailed needs analysis and used a priority determination method that was a compromise between the t-test, Borich needs analysis, and The Locus for Focus model. The specific procedures for analysis are as follows. First, use a t-test to check whether there is a statistically significant difference between importance (desirable level) and implementation level (current level). Second, the need value is calculated through the Borich need analysis. The Borich requirement value provides direction for prioritization by assigning weight to the difference between importance and implementation. Third, the locus for focus model is used to determine the location of items on a coordinate plane consisting of two axes to confirm priority. Finally, after identifying the items and numbers included in the HH quadrant and LH quadrant in The Locus for Focus model, the items included in the top ranking of Borich's needs are comprehensively considered to identify overlapping priorities.

3. RESULTS

3.1 Analysis of differences and needs for experience, collaboration, and enquiry based learning

In order to analyze learners' needs for experience, collaboration, and enquiry based learning, the results of a needs and priority analysis using the t-test and Borich needs analysis in this study are shown in <Table 4>. As a result of conducting a t-test to determine whether there was a statistically significant difference between the importance(need level) and implementation level(current level) for experience, collaboration, and enquiry based learning. 20 detailed items except the 'collaboration' of collaborative learning had a statistically significant difference between need and implementation. Among the items, the item with the highest t-value was C1 (deep learning), and the item with the lowest was B1 (collaboration).

Table 4. Results on t-test and Borich needs analysis

Items	RCL		PCL		*t*	*Borich*	Rank (area)	Rank (Total)
	M	*SD*	*M*	*SD*				
1. Experience								
A1 Experience	4.08	.879	3.81	.963	5.176***	1.09	6	12

A2	Reflection	4.06	.858	3.77	.928	6.294***	1.16	5	9
A3	Abstract Conceptualization	4.21	.809	3.92	.936	6.599***	1.22	4	8
A4	Application	4.09	.883	3.75	.921	7.568***	1.41	3	5
A5	Connecting Theoretical Knowledge with Practice	4.17	.831	3.79	.882	8.374***	1.58	1	3
A6	Interest	4.18	.848	3.92	.931	6.076***	1.06	7	13
A7	immersion	4.16	.846	3.79	.929	8.052***	1.54	2	4
2. Collaboration									
B1	Collaboration	3.98	.946	3.99	.955	-0.320	-0.06	7	21
B2	Reciprocity	4.20	.853	4.04	1.012	3.578***	0.70	3	17
B3	Conflict Management	4.22	.826	3.96	.898	6.399***	1.11	1	11
B4	Contribution	4.33	.831	4.24	.828	2.748**	0.39	5	19
B5	Respect for Diversity	4.30	.797	4.21	.795	2.518*	0.38	6	20
B6	Assistance	4.21	.839	4.05	.908	4.250***	0.71	2	16
B7	Relationship Building	4.27	.836	4.14	.864	3.760***	0.55	4	18
3. Enquiry									
C1	Deep Learning	4.10	.823	3.68	1.011	8.873***	1.74	1	1
C2	Idea Exploration	4.13	.833	3.83	.918	6.391***	1.22	4	7
C3	Designing Problem-Solving Methods	4.19	.824	3.97	.886	5.245***	0.90	7	15

C4	Self-Directed Learning	4.25	.828	3.86	.943	7.906***	1.67	2	2
C5	Curiosity	4.23	.827	3.92	.948	6.461***	1.32	3	6
C6	Holistic Thinking	4.17	.823	3.92	.890	6.152***	1.06	6	14
C7	Connecting Ideas	4.16	.831	3.89	.915	5.978***	1.15	5	10

*** $p < .001$, ** $p < .01$, * $p < .05$

Next, the Borich need value was calculated to confirm the need for experience, collaboration, and enquiry based learning. As a result, the need for item C1 (deep learning) was the highest at 1.74, followed by C4 (self-directed learning), A5 (connection between theoretical knowledge and practice), and A7 (immersion). In other words, these items can be interpreted as items in need of improvement, given priority as items in which the current level perceived by the learner is low compared to the importance (level of need).

On the other hand, in the case of area B, which corresponds to collaboration based learning, although the importance was relatively high compared to other areas, the level of implementation was also higher than other areas, so it can be interpreted that the need was not high.

3.2　Results of The Locus for Focus model on experience, collaboration, and enquiry based learning

The Locus for Focus model to comprehensively determine the priority of needs for experience, collaboration, and enquiry based learning is as follows [figure 1].
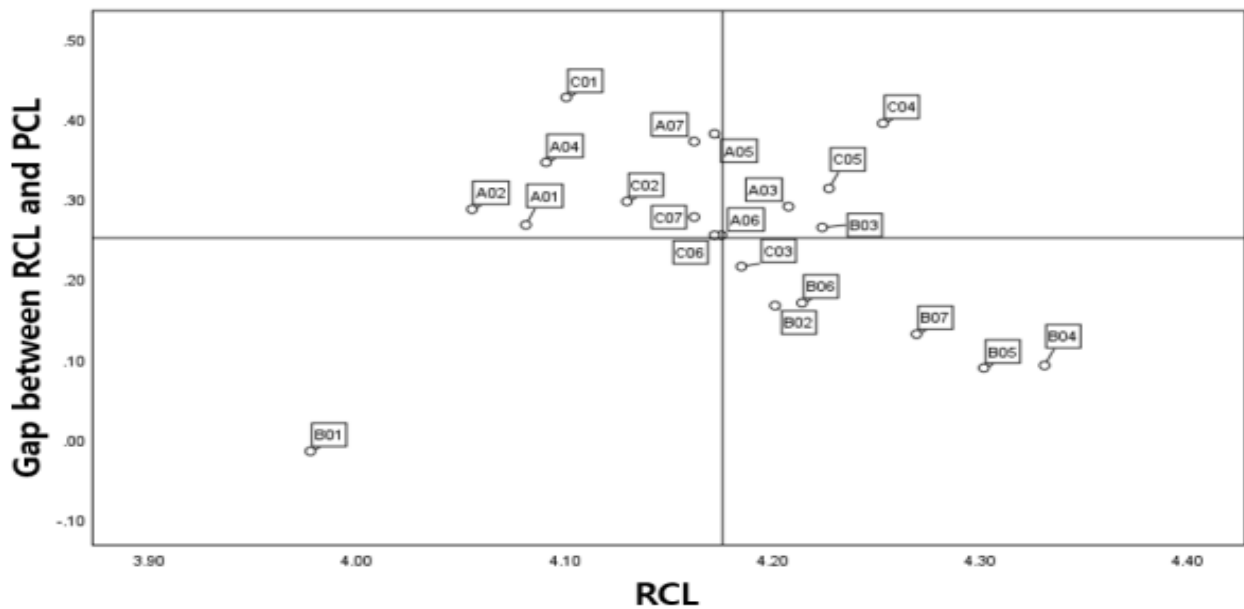

Figure 1. Result of The Locus for Focus model

The result of locating item values on the coordinate plane by setting 4.18, the average of importance(level of need), a total of 5 items included in the HH quadrant with the highest priority were A3(abstract conceptualization), A6(interest), B3(conflict management), C4(self-directed learning), and C5(curiosity). Although the importance is somewhat low, the difference between the two levels is large, and the LH quadrant, which is classified as the next highest level, includes A1(experience), A2(reflection), A4(application), A5(connection between theoretical knowledge and practice), A7(immersion), and C1(deep learning), C2(idea exploration), C6(comprehensive thinking), and C7(connection of ideas).

Lastly, considering the priority according to the Borich need value as many items included in the HH quadrant of The Locus for Focus model, the final priority items are shown in <Table 5>.

Table 5. Results on the final priority items

rankin g	Experience							Collaboration							Enquiry						
	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
Borich	12	9	8	5	3	13	4	21	17	11	19	2	16	18	1	7	15	2	6	14	10
LF model	LH	LH	HH	LH	LH	HH	LH	LL	HL	HH	HL	HL	HL	HL	LH	LH	HL	HH	HH	LH	LH

The item with high common need in the Borich need ranking and The Locus for Focus model was C4 (self-directed learning). This item had the highest level of learner need for experience, collaboration, and enquiry based learning, and can be considered to be the task that needs to be improved first to promote it.

And A4(application), A5(connection between theoretical knowledge and practice), A7(immersion), and C1(deep learning) were ranked high only on the Borich need scale, followed by A3(abstract conceptualization), A6(interest), and B3(conflict Management) and C5(Curiosity) were given high priority only in The Locus for Focus model, so they can be interpreted as having the next highest level of need.

4. CONCLUSION

This study collected sample data from a total of 308 college students to analyze learners' needs for experience, collaboration, and enquiry based learning, and analyzed the collected data using the t-test, Borich needs analysis, and The Locus for Focus model. The discussion focusing on the results confirmed through this process is as follows.

First, the need for items corresponding to enquiry based learning was found to be the highest. This result is because as the paradigm of education changes, learners' needs for education are also changing. Therefore, in order to solve real-life problems, it is necessary to operate a teaching and learning method that allows learners to learn independently with curiosity and find new ideas. In particular, self-directed learning was the highest priority item in both the Borich needs analysis and The Locus for Focus model. These results reflect the learner's need for self-directed learning and at the same time reflect the importance of student agency emphasized by OECD 2030.

Second, the need for items related to experience based learning was generally high. All items except A1(experience) and A2(reflection) were included in the priority list. These results mean that despite universities providing a variety of experiences to realize learner-centered education, learners need richer learning experiences. Experiential learning can include not only direct experiences that students can directly experience and reflect on, such as experiential learning, experiments, and practical training, but also indirect experiences through books, videos, and special lectures. However, in order to be an appropriate experiential

learning, reflection and transfer to other learning must be included during the experiential process, and efforts by universities to provide such a process are necessary [4].

Lastly, the need for collaboration based learning was found to be the lowest. These results do not imply that collaborative learning is unnecessary. Rather, as the level of need for collaborative learning is high, the current level is also high, so it can be interpreted that the level of need is relatively low compared to other areas. In other words, universities recognize the importance of collaborative learning and run many classes to promote it, and research is needed on team task composition and peer evaluation methods to continue this.

This study analyzed learners' needs for experience, collaboration, and enquiry based learning using t-test, Borich needs analysis, and The Locus for Focus model. Through this, it is expected that it can be used as basic data to develop and operate a university curriculum based on experience, collaboration, and enquiry based learning to realize learner-centered education. However, this study was limited to college students in G City, which limits the ability to generalize the research results to all regions and subjects. Accordingly, it is necessary to expand the scope and target of research. In addition, follow-up research is being conducted to explore ways to improve experience, collaboration, and enquiry based learning from a broader perspective by analyzing the perceptions and needs of various subjects, such as professors and university officials, who are the main subjects of experience, collaboration, and enquiry based learning.

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