

초등학교 코딩 수업에 플립러닝의 적용

김현정¹ · 성연옥² · 서영건^{1*}¹경상대학교 컴퓨터학과, 대학원 문화융복합학과²경상대학교 사회과학대학 행정실

Applying Flipped Learning to Coding Class of Elementary School

Hyeon Jeong Kim¹ · Yeon-Ok Seong² · Yeong Geon Seo^{1*}¹Dept. of Computer Science and CCBM of Graduate School, Gyeongsang Nat'l University, Gyeongnam 52828, Korea²Administrative Office in College of Social Science, Gyeongsang Nat'l University, Gyeongnam 52828, Korea

[요 약]

2018년부터 초중고에서 정보교과가 순차적으로 도입되고 있지만, 전반적으로 실행하는 데는 여러 문제가 있는 상황이다. 정보교과에 가장 유용하게 사용할 수 있는 학습 방법으로 플립러닝 기법 적용할 수 있는데, 본 연구는 플립러닝을 정보 교과 학습에 적용하고 어떤 영향을 미치는지를 기존의 학습 방법과 비교 분석해 본다. 전통적인 학습과 플립러닝을 비교 연구한 결과는 다음과 같다. 첫째, 플립러닝의 수업방식은 코딩 수업에 학습동기 향상에 효과가 있었다. 사전에 미리 연습을 한 학생들의 자신감이 향상됨을 보였다. 또한 수업에 집중하는 모습과 적극적으로 참여하고 토의하였으며, 수업 내내 흥미와 호기심이 수업이 끝날 때까지 지속되었다. 둘째, 수업 내용에 대한 이해도가 크게 상승하였다. 수업에 대한 집중도, 관심도, 참여도, 이 모든 것이 플립러닝 학습의 효과라고 볼 수 있다. 셋째, 교사가 학습 전 작성해야 하는 학습 자료 개발로 인하여 업무량이 많아졌다.

[Abstract]

Since 2018, information has been introduced in the schools in sequence, but there are a number of problems in implementation. In this study, we apply flipped learning(FL) as a learning method that is most useful for information subject. This study applies FL to information subject and compares it with the existing ones. The results of comparative study between traditional one and FL are as follows. First, the teaching method of FL was effective in improving learning motivation in coding class. It was shown that self-confidence of the students who had made preparations beforehand improved. Besides, they actively participated and discussed how to concentrate on the lesson. Their interest and curiosity throughout the class continued until the end. Second, comprehension of the content of the class has greatly increased. Focus, interest, and participation in the class are all the effects of FL. Third, workload that teachers should prepare before learning has increased due to the development of learning materials.

색인어 : 플립러닝, 정보교과, 코딩, 학습 동기, 학습 효과

Key word : Flipped learning, Information subject, Coding, Learning motive, Learning effect

<http://dx.doi.org/10.9728/dcs.2019.20.9.1831>

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License(<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Received 27 July 2019; Revised 17 August 2019

Accepted 20 September 2019

*Corresponding Author; Yeong Geon Seo

Tel: +82-55-772-1392

E-mail: young@gnu.ac.kr

I . Introduction

The society is changing rapidly due to the development of science and technology, and the world needs future talents with problem solving ability, communication, consideration and creativity to adapt to the changes in the times. This study suggests flip learning(FL). According to [1], as the number of sites that provide learning materials and high-quality lectures free of charge to the internet, such as TED and Khan academy, which started in the US in 2010. FL goes through the process of constructing or reconstructing the knowledge acquired by the learners into a new sense of information. This process involves learner involvement, cooperation, strategy, and activity learning. FL is problem-based learning activities found in active activities and constructivism. And the teaching lecture is a direct teaching method found in behaviorist principles.

In the study using FL, the experiment is being published in various perspectives and experiments where the learning efficiency of learners is increasing. In addition to improving learners' active learning, they can lead to lectures, a sense of responsibility, a sense of cooperation, higher learning satisfaction, and higher academic achievement. [2] said, "FL is different from blended learning in terms of linking online and offline lectures." To achieve effective FL instruction, it is more important for teachers to design and implement various activity classes that are centered on students in the classroom rather than excessive interest in online video[3]. To increase the effectiveness, there are many strategies that are used in classroom[4]. There are peer teaching methods using 'peer teaching method', 'mini lecture', and using 'havruta', and collaborative learning, cooperative learning, problem-based learning are also being used as a method of classroom instruction for FL.

In the case of applying the peer teaching method in FL instruction method, the expected effects are summarized as follows[5]. First, students understand the contents of learning through pre-lecture online video learning and become interested in learning and interest in classroom lesson. Also, even if they do not understand online video learning in advance, it is expected that positive effects will be achieved in terms of achievement.

Second, FL's upside-in-the-class approach increases the amount of time a peer can be active, allowing enough interaction and feedback to understand and solve difficult coding problems and related problems. Therefore, both peer teachers and peer learners are expected to improve their positive attitudes by being able to understand and develop their knowledge of coding subjects.

Third, by learning online contents in advance, students ask questions about learning, curiosity, and motivation. In addition, responsibilities and cooperation are increased according to role assignments in peer instruction which is teaching and learning, and students can learn in an intimate atmosphere and positive classes are expected. And it is expected that self-directed learning ability will be expanded by learning on-line contents by oneself.

FL has the characteristic changing the learners from passive learners to active learners, and changing the time concept of solving class time and their tasks. Up until now, the main focus of the school class was to get back home from the teaching of the teachers, to learn what they learned and to solve the problems. This was a way for students to maintain a passive attitude and not to engage in active participation in the class and to lose interest. Therefore, this study recognizes that school class should be changed into flexible environment, learner-centered learning culture, and learner-led learning culture, and students should learn materials with online in advance as a way to actively participate in class and would like to try to understand the achievement of the students when they have been taught in advance.

II . Theoretical Background

2-1 Concepts of FL

FL is translated into inverted learning, reverse progressive teaching, reverse learning, and backward instruction. The first person to start FL with classes was Bergmann & Sams, an American high school teacher. As a chemistry teacher, they produced videos that can be watched at home for students with frequent absenteeism clubs. Based on these audiovisual materials, they started to learn FL. As FL means 'flipped', FL reverses the traditional way of teaching. Teacher' s lesson in the classroom is presented as a video-type learning task, and the task or application activity presented as a learning task comes into the classroom. In other words, unlike traditional classes, it is a name given in the sense that the tasks and application activities are at school.

According to [6] which analyzed classroom sociological meaning based on the teaching methods and experimental experiences of the teachers who participated in the FL experiment, FL had students learn activities of the subject knowledge at home, In the classroom, classroom instruction that overturns the classical way of teaching leads to a change in the structure of the classroom, the role of the teacher, and the

change in the attitude of the students. However, rather than relying on audiovisual data in the form of video, lectures are conducted as guides to the lesson contents to be taught by the students, and the center of the lesson is the students' own learning.

If the existing learning method was a teacher-centered introductory education, FL is a student-centered class, and the teacher turned into the role of an assistant in presenting direction so that students can lead the class well. Table 1 shows the comparison between traditional classroom of [7] and FL classroom.

표 1. 전통적 교실과 FL 교실의 비교

Table 1. Comparison of traditional class and FL class

Division	Traditional class	FL
Instruction method and contents	Teaching which teachers delivers subject-centered knowledge	Student activity and learning center for understanding and deepening about the contents they learned in advance
Role of teacher	Knowledge deliver / Controlled discipline	Coach/Mento/Guide
Interaction	Restricted interaction between teacher and student	Voluntary interaction between students
Class atmosphere	Restricted and passive atmosphere	Free and positive atmosphere

2-2 Interaction of FL using peer instruction

Peer instruction is a way for a student to learn by helping and teaching other students. It is a teaching method in which students discuss the results based on materials that have been studied in advance and share collaborative results while sharing knowledge. According to [8], it is an effective way to explain and clarify his/her thoughts through discussions with peer learners, and to help students reconstruct individual thoughts. It can be said that this is an active participation of learners in comparison with teaching methods centering on textbooks.

Peer tutoring can be said to be the study of the contents of the detailed learning area and the interaction of the learning techniques by allocating the roles of tutor and tutee. In recent years, there are reciprocal peer tutoring, a method that does not discriminate between the roles of tutor and tutee, but most research papers to date have mostly distinguished roles. Peer teaching is a process in which a student who has mastered content is taught and a way that teaches some of their peer learners who have not done so, It is a learning method that helps the instructor of the tutor as well as the learner of the teacher. Although the learner interdisciplinary method so far

has some differences in application method and procedure, the advantages are similar and can have a positive effect on both peer tutor and tutee. Describing the merits of peer teaching and learning according to their roles allows peer teaching to have the opportunity to demonstrate their own learning skills as they try to make meaningful tools by teaching their peer learners and deepen understanding about learning content, and basic knowledge is strengthened. In addition, students can fully develop their sense of responsibility, cooperation, or other self-esteem while playing a role as a teacher, and experience a mature role as a member of society.

2-3 Research tools

There are a variety of research tools for implementing FL, but this section only describes four important ones. First, self-directed learning is defined in various ways, and is used in terms of self-regulated learning, self-controlled learning, and self-teaching according to perspectives. [9] viewed self-directed learning as a self-taught concept of learning without the help of a teacher. Then [10] defined learning where the student takes the initiative of learning without help of others beyond self-study. [11] suggested that this self-directed learning can be distinguished from the learning process and the learner's personality traits according to some point of view. This study will examine whether FL has improved self-directed learning ability in the process of learning video beforehand in FL.

Collaborative learning is based on the cognitive conflict of Piaget in the form of two or more learners in a classroom lesson. Collaborative learning activities are actively conducted in the classroom through lively discussions and participation between learners and instructors, learners and learners. The activities include grouping students representing various interdependencies and interpersonal skills, small-group capable of problem solving, peer instruction promoting cooperation or cooperative learning among peers, and peer feedback in the peer review process. The instructor constantly monitors the learners' personal supplemental learning and deepening learning and evaluates the learners. When discussing collaborative skills and activities in information class of middle school, quoting deep aspects and meaning is an important part of FL.

Teachers' professionalism is also an important research tool because teachers in FL must play an increasingly important role for students' cooperation, responsibility, and flexible instruction, unlike simple knowledge transfers. When the results of FL are obtained, the learners get satisfaction, and are willing to learn and become the subject of learning. This satisfaction or interest is an important research tool, and

implicit reinforcement, external reward, and fairness constitute a component. Then, the purpose of this study is to investigate how students' learning motivations change using self-confidence, attention, satisfaction, questionnaires and interviews.

표 2. FL 설계시 고려 사항

Table 2. Points to consider to design FL

Key points	Points to consider
Flexible environments	- Flexibility for learning time and space - Providing evaluation factors and methods for various activities
Change of learning culture	- Student-oriented class - Providing appropriate learning for each student
Intended content	- Teacher's intentional plan of what to learn
Professional teacher	- Change of teacher's role - Continuous observation and feedback during class

III. Class Design Using FL

3-1 Research method and research object

This study is about how lessons using FL method affects student achievement. Specific research problems are as follows.

Problem 1. What is the class before FL?

Problem 2. How much does the students pre-study the handout given by the researcher?

Problem 3. How did the class after FL change?

Problem 4. Is there a burden on the quantity, quality or tasks that the instructor needs to prepare?

These problems and considerations for FL design are as table 2. The limitations of this study are as follows.

First, there is a difficulty in expanding interpretation of the results of the study to the students of the same age and the students of the other districts because the study is aimed at the students of coding class 6 grade in A elementary school and B elementary school.

Second, it is difficult to generalize the results of research into all subjects because it is an elementary school after-school coursework.

Third, because the experiment was conducted within a relatively short period of one month, it is difficult to verify the effect of long-term FL on participation in class.

The objects for the experiment were 2 elementary schools with 6th grade 1st semester coding section and 2nd section "My own animation card" as a unit to be applied to FL class. After

conducting the pre-test by dividing into experimental group and comparative group, former group used flipped learning, and latter group did the classical one. And then the study researched the influence of FL on learning motivation through post-test.

표 3. 연구 대상

Table 3. Research object

Group composition	Mail	Female	Total
A elementary school 6 th grade	13 kids	11 kids	24 kids
B elementary school 6 th grade	14 kids	12 kids	26 kids

3-2 Research procedure

This study is based on the class procedure of FL through the flipped class model of Information subject of middle school and consists of 5 steps. Each step consists of the main principles according to the detailed activities.

○ Step 1: Before the class

- Watching the content

Consisting of objective knowledge and principles related to the class and after watching the content, confirming the degree of learning in the form of quiz, mind map, comment discussion and post-it

- Lecture notes

Organizing their notes into what they found by themselves, what they did not understand, and what they wanted to know

- Interaction of teacher and student

Inquiring and responding about contents of lectures using online media

○ Step 2: Introducing the class

- Checking the class preparation

A simple prior knowledge assessment for prior knowledge checks and inadequate students listening again

- Introducing application tasks

Providing motivational data and motivating curiosity about activities

- Teaming

Assigning team members for peer instruction, active communication and creative problem solving

- Executing application tasks

Acting core topics and content application taught through lectures

- Interaction of teacher and student

Monitoring and feedback, small lectures by teams, and query and response

○ Step 3: During the class

- Peer teacher
 - A time that it is composed of tutor and tutee, and a time when a colleague becomes a teacher while teaching and being taught with each other
- Step 4: After the class
 - Execution of high-level knowledge application task
 - Enrichment activities based on students' creativity through experiential knowledge
 - Activity evaluation
 - Quiz activities and presentations by team (performance assessment)
- Step 5: During the day
 - Interaction of teacher and student
 - Identifying key topics or expanding learned knowledge, finding sources of information that students need to build knowledge, or interacting using on-offline tools to help them when they need help from a teacher(or colleague)

Since the part that precedes FL in advance may require exchanges of information among students, the teacher considers ways to actively communicate with each other when designing the class. In class, learners can solve problems through discussions, and conduct intensive activities in the process of acquiring and understanding knowledge. In the process of learning, the teacher should induce an atmosphere that facilitates the discussion smoothly. After learning, the learners check the contents learned through feedback, presentation, or performance assessment, and if there is a question, they instruct to make a positive effect by supplementing the deficient part through their guidance and the time for question and answer.

One of the theoretical bases of FL, Bloom's educational goal classification system as figure 1 is a high-level thinking that analyzes and evaluates concepts, procedures and principles in a low-level category in which students memorize facts by simple learning is to expand educational goals[12]. The learner argues that it is necessary to go through each dimension to make progress to the next level and not to learn all dimensions in one class[13]. However, in FL, Bloom 's educational goal classification is turned over to allow students to memorize and understand through pre-learning, to apply and analyze through the learning time of main class, and besides to guide students to the stage of evaluation and creation.

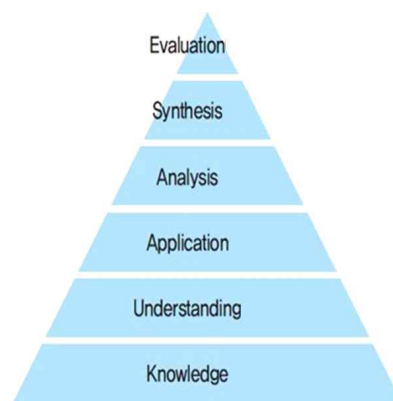


그림 1. Bloom의 교육목표분류

Fig. 1. Bloom's educational goal classification

3-3 Instruction design and data analysis

To investigate the effect of FL on learning motivation, two schools were selected as A and B elementary schools, and 50 students were divided into experimental group and comparative group. In the study, the former was taught based on constructivism using FL, and the latter was taught in the traditional method with 8 times . On the first week, A elementary school was taught by the traditional, B elementary school by FL. On the 2nd week, A elementary school was held in FL and B elementary school was taught in 4th class in the traditional with 4 times. The lessons were taught in distinct ways with the same chapters.

Content for FL consists of what they must learn in class and we had them learn key points using videos, pictures, and classroom-related learning materials, and then participate in the classes, and made use of related programs to inform their parents. They also commented through the band to ask teachers questions and share ideas. Since both groups need to verify whether they are similar to each other in the beginning of the class, we conducted achievement tests in the same unit. A score of 25 points per a test was used to score 100 points and partial scoring was given. Since the two schools have taught in traditional ways, the results of the pre-test are shown in table 4 for both groups.

As a result, the score difference between A and B schools is 3 and the standard deviation means also a similar group with little difference, The research motivation questionnaire was started at the beginning of the study. The validity of the questionnaire was analyzed above, and the students' score on the question was very similar to the score on the 5-point scale and both schools showed more than average scores. Questions about learning on their own came out as usual, and they showed

confidence in 'likely to be easy' and most of students checked 'usually'. When it converted to 100 points, the result was 62.1 points. The students were expecting a new learning method because of the FL. We would like to take the class through the preliminary questionnaires and the interviews and also draw out the results..

표 4. A, B 학교의 사전 테스트 결과

Table 4. Pre-test results of A and B schools

Group	A school	B school
Average	74 points	77 points
Standard deviation(SD)	15.13	14.25

표 5. 1 주차 성취도 평가 결과

Table 5. Result of achievement evaluation over 1st week

Group	A school(FL)	B school(classical method)
Average	83.25 points	79 points
SD	9.27	14.13

표 6. 2 주차 성취도 평가 결과

Table 6. Result of achievement evaluation over 2nd week

Group	A school(classical method)	B school(FL)
Average	79 points	84.84 points
SD	15.13	8.34

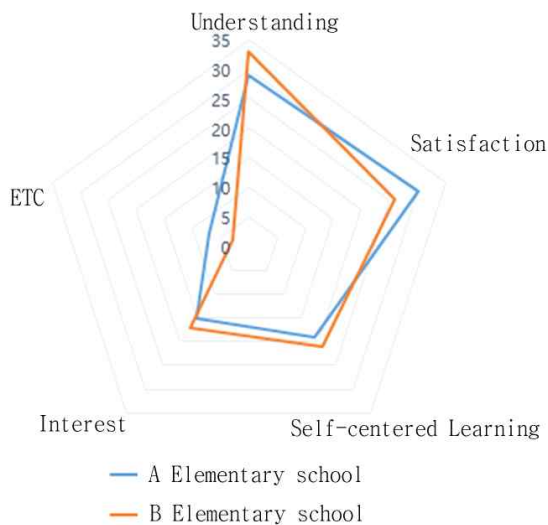


그림 2. 사후 설문 조사

Fig. 2. Follow-up Interview

IV. Experiment and Evaluation

4-1 Effects of coding class using FL

To investigate the effectiveness of the coding class using FL, this study were able to derive the various effects of FL in the students' conversation by analyzing the achievement evaluation and the student's interview. Among them, the most talked about was 'improvement of coding understanding', 'positive change of learning attitude', and 'improvement of self-directed learning ability'. Let's look at the process in which these results come out. The results of the performance assessment conducted over the first two weeks are shown in tables 5 and 6.

As shown in tables 5 and 6, the learners in the experimental group were 5 points higher than the students in the comparative group. Overall, the students' performance was improved, and the results showed that they had a positive effect on achievement and interview. The most frequently written contents of students' interviews were "easy to understand" and "class was fun". As a result of learning through contents, they were able to talk with their friends and talk with them on various topics and lead the class in a more positive atmosphere. In addition, students' surveys were conducted to investigate and analyze the satisfaction of flipped learning. The satisfaction are as follows. Terms of 'FL was helpful in understanding learning' were 33%, 29%, terms of 'self-directed learning helped' were 21%, 19%, and terms of 'classes were generally satisfactory' were 26%, 30%, respectively.

One of the most common words in analyzing the students' interview was 'understanding'. The students had a lot of stories in FL coding classes that 'it was easy to understand' than the traditional infusion class. It was confirmed that the understanding which students mentioned did not stay in simple memory, and that the understanding of coding knowledge, and application of higher level learning was possible and learning understanding was improved. In FL class, students learn concepts and learning knowledge in classroom lessons through a video lecture prepared by the teacher. In this process, the students memorize the contents of the classroom lesson in advance. In addition, students will have the opportunity to make use of the contents prepared by the students during the class time, so that they can understand the concepts and apply the contents to new situations.

Classes in which all students participate actively in all classes have long been emphasized. In the actual class, lecture class has been done because the class led by the teacher is efficient. However, through FL, students were able to find answers to these real-world problems in the interview analysis.

In the previous two categories, we looked at the center of the cognitive change of students through FL. This change in

cognitive aspect starts with a change in the attitude of learners. The good thing about FL classes was that they had more time for studying, because they shared their own preparation. Through the interviews, we confirmed that students were able to participate actively in the classes by guessing and studying the activities to be done in classroom before class, and started from the same starting point as other friends.

4-2 Problems and improvements of FL coding class

We have already discussed the effectiveness of FL. The results of analyzing the contents of the students' interviews to see the problems of FL class can be divided into 'problem in the classroom' and 'improvement of FL'.

In the outside of the classroom, that is, before the lesson, they were bored with the video that they was watching. Because out-of-class lessons lead students to being boring or not seeing a picture when they do not want to see it, various attempts are needed to attract students' interest. The previous studies have also pointed out the problems of classroom instruction in FL classes. [14] stated that as the learner's autonomy increases, there are more students who do not study in advance, and [15] stated that it was difficult for them to participate in pre-study in elementary school. [16] said that watching videos played out of the classroom is an additional problem for the students. Therefore, outside the classroom, the class should be given enough amount of learning that it will not be burdened to the students, and it is necessary to create an environment in which students can participate actively.

One of the things that needs to be improved in FL is that there are a variety of ways to get students interested in out-of-class lessons. For example, teachers should consider how students can use descriptive characters and how they can attract students with a variety of visual effects. There is also a way to encourage parents or students to view the content without forgetting the message. The problem in the classroom was caused by the difference in the speed of learning as the students who understand it quickly explain it to the students whose understanding is a bit slow. Even classroom instruction is a good way for all students to understand and pass on because of their peer teachers, but it seems that not all students are satisfied.

V. Conclusion

Since 2018, elementary, middle and high schools have mandated information courses. However, it is said that the

education method is effective in the information delivery because it is mainly focused on the infant education centered on teachers, but the effect of self-directed learning is minimal because it is passive in the learning of students. The FL, which flipped the new teaching method that started from this problem, showed that self-directed learning is possible by deriving the task by discussing in the class based on the videos that were reported before class. In addition, as the students discuss the questions with each other, the relationships between the students, the teacher and the students were improved, FL is a very effective way to achievement and satisfaction.

This study suggests the followings based on the results of experiments with experimental group and comparative group using FL. First, to learn with FL, the teacher must produce the digital content. As a result of the simple visualization, the interest of the student decreases and the number of students who do not prepare for the examination increases, and as a result, the merits of this teaching method will not be shown. Second, it is necessary to constantly recognize and try to make FL, a student-led class that can improve students' active participation, high interest, and friendship. Third, people know the merits of this teaching method, but it is not done by the effort of one teacher.

References

- [1] D. Y. Lee, "Research on Developing Instructional Design Models for Flipped Learning", *Digital Convergence Research*, Vol. 12, No. 12, pp. 83-92, 2013.
- [2] G Y. Kim, " An Analysis of the Effect on Learning Satisfaction from Flipped Learning", *Korea Broadcasting University, Doctoral Thesis*, 2015.
- [3] N. I. Kim and etc, "A Case Study of Flipped Learning at College: Focused on Effects of Motivation and Self-efficacy", *Education Engineering Research*, Vol. 30, No. 3, pp. 467-492, 2014.
- [4] J. H. Im, "A Study on the Development of Instructional Analysis Tool for Instructional Consultation of Flipped Learning", *Education Engineering Research*, Vol. 34, No. 1, pp. 101-132, 2018.
- [5] S. H. Kim, "Development of Flip Learning Instruction Model Using Smart Tool", *Learner-centered curriculum education*, Vol. 19, No. 10, pp. 1021-1048, 2019
- [6] M. G. Lee, "Case Study on Effects and Signification of Flipped Classroom", *Korea Education*, Vol. 41, No. 1, pp. 87-116, 2014.

[7] H. N. Song, "Impact on Learning motivation of a SW-STEAM Education Program using the Flipped Learning", *Gyeongin Education College, Master Thesis*, 2018.

[8] S. H. Park, "The Effect of High School Chemistry and Flip Learning Instruction Using Peer Instruction on Academic Achievement, Scientific Attitude, Self-directed Learning", *Incheon University, Master Thesis*, 2017.

[9] Tough. "Learning without a Teacher : a Study of Tasks and Assistance During Adult Self-teaching", *Toronto:Ontario Institute for Studies in Education*, 1967.

[10] Knowles, "Self-directed Learning: a guide for Learners and Teachers. Chicago", *Follett Pub. co.*, 1975.

[11] Song, L, and Hill, J. R., "A Conceptual Model for Understanding Self-directed Learning in Online Environments", *Journal of Interactive Online Learning*, Vol. 6, No. 1, pp. 27-42. 2007.

[12] Bloom, B., "Taxonomy of Educational Objectives : Handbook I", *Cognitive Domain. NY:David Mckay*. 1956.

[13] Anderson, L. W. and Krathwohl, D. R., "A Taxonomy for Learning. Teaching, and Assessing : a Revision of Bloom's Taxonomy of Educational Objectives", *NY:Longman*, 2001.

[14] S. J. Park, "Development of the Revised Model of Flipped Classroom and Analysis of Its Educational Effects", *Society Subject Education Research*, Vol. 22, No. 2, pp. 1-21, 2015.

[15] J. M. Lee and etc., "A Study on Cases for Application of Flipped Learning in K-12 Education", *Korea Digital Strategy Society*, Vol. 14, No. 8, pp. 19-36, 2016.

[16] G. L. Choi, "Influence of Satisfaction of Flip Learning in Middle School Students on Mathematical Attitude", *Joongang University, Master Thesis*, 2017.

성연옥(Yeon-Ok Seong)



2000년 : 한국방송통신대학 경영학과
학사
2011년 : 경상대학교 경영학과 박사

1988년~ 현재 : 경상대학교 사회과학대학 재직

관심분야 : 플립 러닝, PBL, HR, HRD

서영건(Yeong Geon Seo)



1987년 : 경상대학교 전산과 학사
1997년 : 숭실대학교 전산과 박사
1989년~1992년 : 삼보컴퓨터
1997년~현재 : 경상대학교
컴퓨터과학과 교수

2014년~현재 : 경상대학교 대학원 문화융복합학과 교수

2011년~현재 : 경상대학교 공학연구원 멤버

2018년~현재 : 경상대학교 교육정보전산원 원장

관심분야 : 의료 영상 처리, 머신 러닝, SLAM, 영상 인식,
컴퓨터 네트워크, 컴퓨팅 사고

김현정(Hyeon Jeong Kim)



2016년 : 국가평생진흥원,
컴퓨터공학과 학사
2019년 : 경상대학교 교육대학원
컴퓨터교육 전공 교육학석사
2019년~현재 : 경상대학교 대학원
컴퓨터과학과 박사과정 재학

관심분야 : 머신 러닝, 컴퓨팅 사고, 영상 처리