Abstract

**Purpose:** At a time when talents with convergence and consilience who can create creative ideas at the center of talents with various knowledge through infusion and memorization education with experts in a specific field become the object of envy, talents who fit the trend of the times in universities, which are higher education institutions The need for nurturing is increasing, and creative convergence talents including mutual collaboration ability and self-directed learning are in the spotlight rather than individuals. Two-way interactive communication education is absolutely necessary at the center of nurturing creative fusion talents, and this is to foster creative fusion talents through mutual communication education.

**Method:** Creative convergence talent refers to talent with humanistic imagination and creativity in science and technology, and collaboration-oriented communication education is needed rather than individual-centered education. Tools are required In this study, through the production and use of e-books, convergence thinking skills are enhanced, teachers and learners can share with each other, and creative imagination can be enhanced through class-centered teaching methods.

**Results:** In this study, questionnaire evaluation and analysis of learners were conducted, and the responses of learners were evaluated by evaluating the satisfaction of teaching methods using various educational models and flip learning. Through this, an important foundational material was prepared for designing the right direction for future education.

**Conclusion:** This study presented the e-Book Production and Interactive Communication Education Practice, and the results of the class using a learning method based on various communication tools were very satisfactory and it was considered that a major change occurred in the class. In the future, follow-up research such as the development of new smart devices that can expand learner-centered capabilities and the development of creative content will continue.

**[Keywords]** Online Communication, Convergence, Creativity, E-Book, Education

1. Introduction

More than five years have passed since the 4th industrial revolution was declared[1], and many changes are taking place in society. Self-driving cars that drive themselves without a human being have become commonplace, and drones that can freely shoot high-rise buildings over mountains and seas without a human being, and even mount weapons, are in full swing. Things that were unimaginable even just a few decades ago are becoming a reality. In order to actively respond to this rapidly changing society, companies are accelerating their efforts to recruit talented people. Moreover, global companies are investing a lot of time, money, and research intensively to develop new products suitable for the times in order to gain an edge in
global competition. Before explaining the talents these companies require, it is meaningful to consider the changes in talent needs from the past. This is summarized as follows.

- [Medieval Society] Geniuses such as Leonardo da Vinci, famous as a genius artist, anatomist, engineer, and thinker, are recognized as key talents.

- [Modern Society] Like Edison, who is widely known as a great scientist and entrepreneur, he prefers talented people with all-around beauty.

- [Modern Society] Leading entrepreneurial talents like Steve Jobs with convergence and consilience capable of creative ideas became the object of envy.

In particular, in the era of the 3rd industrial revolution (1969~2015), which can be called the modern society, among the talents needed by each era, experts in a specific field and talents with knowledge in various fields through infusion and memorization education were in the spotlight[2][3].

However, the need for talent who can understand and lead the rapid technological change such as AI and the emergence of new values in the rapidly changing times is increasing[4][5][6]. This requires more competency from individuals, which means that creative convergence talents are in the spotlight in the future society.

In other words, in the era of the 4th industrial revolution, future companies prefer talents who can converge different fields and creatively derive them rather than experts in a specific field. The requirements of future talents needed by future companies have very important implications.

It means that changes in the educational system at universities, which are higher education institutions, are inevitable. In other words, in a limited classroom, the existing teaching method, classes were conducted according to the textbooks and pre-planned times set by the instructor. However, future education must provide an environment so that learners can freely learn beyond the limited walls of time and space[7][8][9]. Moreover, the shift from the existing teacher-centered teaching method to the learner-centered learning method has become inevitable. Therefore, advanced foreign universities are actively conducting research for various learner-centered education. For example, various programs and contents are being developed, such as Flipped Learning[10][11][12], a reverse learning method, or Gamification[13][14][15][16], which increases interest in classes by introducing games into classes[17][18]. Some universities in Korea are also introducing and conducting programs that can spark interest in classes.

However, there is the most important factor in introducing various programs or contents into the class. That is, instead of a one-way class between the instructor and the learner, the two-way class should be oriented. Interactive class is a class method that has been conducted in advanced foreign universities for a long time, and the famous Havruta education is a typical class method of interactive communication education, and is being actively studied by education experts around the world.

Accordingly, the Ministry of Education confirmed and announced the 2015 Revision Curriculum aimed at nurturing creative convergence talents as a core task for ‘enhancing the capacity of public education’[19]. In other words, the shift from ‘knowledge-oriented education by memorization’ to ‘happy education that enjoys learning’, improvement of student-centered classroom classes, and establishment of a job-oriented vocational education system based on the National Competency Standard (NCS) are significant.

In this study, we intend to examine the design method of interactive communication education, which is the most important for nurturing creative convergence talents, and consider how to use it for e-book production and interactive communication. In addition, it is intended to
examine the direction for nurturing talents required by the future society through practical application cases of interactive online communication classes and the evaluation and analysis of learners' questionnaires. With this as an opportunity, it is meaningful in nurturing the right talents by suggesting the necessity of changing teaching and learning methods, developing contents, and developing various programs[20].

2. Interactive Education Design

What is Creative Convergence Talent? Although the definition of this has not yet been clearly agreed upon by the expert group, many experts believe that talented people with humanistic imagination and scientific and technological creativity based on upright personality are creative convergence talents. In other words, the creative convergence-type talents they say are those who have basic literacy education in the humanities, society, and science and technology fields. However, the talents of the future society emphasize new value creators who can converge various knowledge and create knowledge. In other words, the future society emphasizes talented people who can create new ideas. As shown in the following.

Figure 1. What is creative convergence talent?

The six core competencies of creative convergence talent announced by the Ministry of Education are as follows.

- [Knowledge Information Processing] Ability to process knowledge information for rational problem solving
- [Creative Thinking] Ability to create new things by fusion of various experiences
- [Community] Ability to actively participate in community development such as regions and countries
- [Communication] Ability to express one's thoughts well and to listen to and respect the opinions of others
- [Aesthetic sensibility] Ability to discover the value of life based on empathy and sensitivity
- [Self-management] Ability to live independently

In order to respond to the 4th industrial revolution, the Ministry of Education respects the autonomy of universities, and has been promoting or planning to improve the quality of education from 2020, such as inducing improvement of the curriculum and teaching and learning methods centering on the specialization of universities. Accordingly, there is a wave of efforts to prepare self-rescue measures such as educational system transformation and educational paradigm shift in line with the policies promoted by the Ministry of Education.

Universities, which are higher education institutions, must foster creative convergence tal-
ents required by the future society. It is necessary to nurture talented individuals with humanities literacy and creativity, away from the traditional curriculum centered on infusion and memorization at universities. Interaction communication education is the core of the future curriculum direction.

In other words, the ultimate reason for the need for interactive communication education is as follows. First, since the demand for creative convergence talents based on good character is increasing, it is necessary to create new values by converging and creating various knowledge. Second, it is necessary to motivate learners voluntarily by inducing active participation in class and to increase class immersion to induce high class achievement. Third, in order to realize consilience education beyond the scope of convergence education, it is necessary to aim for learner-centered education instead of instructor-centered education.

In the era of the 3rd industrial revolution, the need for experts in a specific field has increased rather than interactive communication education. Therefore, the lecture was conducted with the teacher’s one-sided teaching method. In the era of the 4th industrial revolution, when creativity is absolutely necessary, there is a need for talents who can converge and create various fields rather than any specific expert. Against this background, demand-tailored products such as AI, IoT, ICT, VR/AR, Self-driving cars, and Drones, Metaverse are being launched[21][22][23], which is accelerating. If this trend continues, it is clear that in the near future, there will be a clear division into two groups: the creative convergence core talent and their followers.

For understanding and empathy, the most important thing is to make interactive communication possible by going beyond the limits of time and space through two-way interaction. In addition, collaboration-oriented communication education is needed rather than individual-centered education. Moreover, for interactive communication education, various communication tools such as VR/AR[24], Google Classroom[25], QuizN[26], Padlet[27], and DocZoom Pro[28] are required.

Above all, the core of interactive communication education should be shared and researched through mutual discussion and dialogue. Sharing is unimaginable in the existing traditional education method, but it is self-evident that education in the future will be more difficult to conduct without a culture of mutual sharing.

In other words, it will be transformed into a class method that has expanded to online/offline classes, away from the existing method in which offline classes were the main focus. Moreover, the rate of spread will be further accelerated by the COVID-19 pandemic. In fact, an environmental culture that is not limited by time and place is being revitalized beyond the limits of time and space. Various academic activities are being operated remotely online, school classes are being conducted non-face-to-face due to the spread of COVID-19, and school management meetings are being held online.

Examples of interactive communication education are as follows. A creative curriculum can be created with a system consisting of real-time feedback using smart tools in the course of a project-oriented class or mutual discussion-centered class, in which the instructor poses a problem through the interactive class tool[29]. At this time, project classes include humanities subject learning centered on imaginative and creative competency, self-directed learning centered on problem-solving competency and knowledge information competency, and collaborative activity learning centered on communication competency and coexistence and common competency[30].

The process of learners autonomously selecting a topic and expressing their thoughts based on it to create a creative work is a good example of interactive communication education in which learners can express their interest and imagination infinitely. The fundamental reason for creating creative works by demonstrating the talents and imagination of learners through class
is that it is the best education for enhancing creativity. Creating one creation by oneself is the driving force for developing several or thousands of items. Also, one of the most important factors in interactive communication education is that the class should be fun from the learner’s point of view. No matter how good a subject is, if there is no fun added to the class, it is a natural result that the learner will move away from it.

In this study, in the design of interactive communication education, the subject name was reading English and American short novels, which is a humanities education, and the project class method expanded with flip learning was adopted as the class method. This meant that the instructor registered the class content suitable for the subject through the online LMS, the learners learned the basic content, and the learner was induced to freely select a topic suitable for the class and create a creative work in a fun way. And when you submit your creations, you need something. The reason for the selection of the topic, the roles of the team members, the production period, and the thoughts of the team members through the creation of the creation must be included.

Above all, it is very important to share the creations of learners with each other. By sharing data with the other party, you can clearly analyze the strengths, weaknesses, and characteristics of your own creations, and it can be very helpful for future creations. Education through sharing can be applied not only to this class, but also to all fields. In order to become an expert in a particular field, data from the field of expertise is absolutely essential. Moreover, sharing is valuable because it allows you to understand the other person’s values, etc., and to obtain data that you do not have.

So, the most necessary thing in the era of Intelligence Artificial in the 4th industrial revolution is sharing[31]. It is an absolute word that can sufficiently strengthen competencies such as collaboration, self-direction, creativity, and thinking ability through sharing. The biggest weapon is that there is very little development of learning methods that can strengthen sharing. Efforts are made to apply the development of teaching and learning methods to each class in each school, but it is also true that there is a limit to increasing the effectiveness. For example, the syllabus necessarily includes the item ‘discussion’ as a way to improve teaching and learning methods, but it is insufficient to actually lead the discussion in the right direction.

In addition, as interactive classroom tools, Google Classroom, a classroom of communication, QuizN, which can enhance the fun of learners with quizzes on class contents, and KakaoTalk chat room for learner management such as announcements and mutual communication were used. And this class aims to develop core competencies of self-direction, communication, and community competence.

3. How to Make and Use E-Books

E-Book is an abbreviation of Electronic Book, and it refers to an electronic book manufactured with an electronic terminal such as a computer, unlike the existing paper book. In other words, e-Books, books, publications, etc., in any form stored digitally. If digital text is reproduced as analog characters, it can be an e-book terminal, so it is convenient because it is not necessary to carry a lot of books. The advantages of e-Books are that they can be reduced by 30% compared to paper books, so the price is low, and the weight of the terminal is light, so it is easy to carry. But there are not only advantages. Compared to paper books, e-books can be somewhat inconvenient to use if inexperienced, and some of the published books are not published as e-books[32].

It can be very motivating if the learner's own work is presented to other audiences. If a learner cannot present confidently in front of other learners who have participated in the class,
learner can convey his thoughts and philosophy to other learners by creating an e-book containing learner’s own voice. Moreover, e-Book Creator can easily combine books, so you can break the classroom wall and work on projects with learners from different countries. <Figure 2> shows Creation and Utilization of e-Books.

In this study, the reasons for using e-books in English and American Short Story Reading classes can be summarized as follows.

▪ Teachers and learners can share the depth of English sentences.
▪ The learner becomes the center of the class and can improve convergence thinking ability.
▪ You can increase your creative imagination through the flipped learning method.
▪ It broadens individual capabilities as a creator, such as video editing and production, maximizing the use of YouTube, and developing various contents, and is helpful in finding employment.

Figure 2. Creation and utilization of e-books.

4. Assessment and Analysis of Learners' Surveys

Survey evaluation and analysis of learners were conducted, and <Figure 3> Educational model that increases immersion in class and <Figure 4> Satisfaction with Flipped Learning applied class method are shown.

Figure 3. Educational model that increases immersion in class.
First of all, as shown in <Figure 3>, the classes that applied flipped learning accounted for more than half (53%) of the total, which was almost twice as high as 27% of the traditional class method. However, 13% of project classes and 7% of video lectures were rated lower than expected. Also, as shown in <Figure 4>, a whopping 73% of the respondents were generally satisfied with the teaching method applied with flipped learning, including very satisfied. However, as 10% of the respondents were dissatisfied and very dissatisfied, there seems to be room for improvement in this class.

4. Conclusion

This paper proposes e-Book Production and Online Communication Education Practice for Public Value. The needs of future companies to actively respond to the era of the 4th industrial revolution and the direction of the government’s education policy were analyzed. Future companies are demanding creative ability to converge various fields with different personality-based characteristics. It can be fully guessed that the government’s willpower for quality improvement is also making stronger efforts than ever before. In this regard, the urgency of a paradigm shift for university education changes and the importance of Online Communication Education Practice due to the impact of the COVID-19 pandemic were examined.

Moreover, online interactive communication education allows students to freely engage in educational activities without time and place restrictions beyond the limits of time and space. It was explained through examples that all fields are active online.

And by reducing the scope of this class, it was designed to enhance convergence and creativity by inducing learners to create creative works including the reasons for autonomous topic selection, the roles of team members, the production period, and the team members’ values through creative production. Moreover, since the most necessary thing in the era of the 4th industrial revolution is share, the advantage of sharing is maximized so that you can understand the other person’s thoughts and values, and develop through comparison with your own thoughts and values.

For the online interactive communication education suggested in this study, students were given the opportunity to create their own e-books through the production and use of e-books. It is evaluated that it is not only able to fully understand the thoughts and values of learners, but also the learners themselves as having fun.

Through the actual online interactive communication education proposed in this study, the
results of classes using various communication tool-based learning methods were very satisfactory, as expected, and it was considered that there was a significant change in the class. In other words, more than half of the learners (53%) were satisfied with the change in class, rather than the 27% who preferred the traditional teaching method. However, there is room for improvement through low survey evaluation such as 7% of video lectures.

Online interactive communication education will be of great help in improving the ability to derive convergence results with the creative thinking required by future companies. The reason is that the process of learners finding answers on their own is proceeding according to their own thoughts, and the created creations are not only owned by themselves, but can become a place of mutual exchange through sharing.

In addition, the creation process for e-books can be enjoyed in a fun way, increasing the interest of the class and the level of immersion and participation in learning. Moreover, it is expected to be of great help in resolving the shortcomings of online remote classes for Corona 19. In the future, follow-up research such as the development of new smart devices and creative contents that can expand learner-centered capabilities will continue.

5. References

5.1. Journal articles


5.2. Thesis degree


5.3. Books


5.4. Additional references


6. Appendix

6.1. Authors contribution

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