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Using Gamification Development of Sex Education Program (Ethical Perspective) for Youth

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Abstract

Purpose: To prevent and respond to youth sexual problems that are becoming more serious with digital development, this study sought to develop a sex education program that applies gamification as an effective method for youth who are digital natives.

Research design, data and methodology: To develop a sex education program for teenagers, elements of gamification were considered based on Dick and Kerry's teaching system design model. The learning content reflected UNESCO's 'Comprehensive Sex Education Guidelines'. In addition, it was designed to enable students to learn about ethics and morals from a social and emotional aspect. **Results:** A four-session distance learning sex education program was developed for first-year high school students. To learn about gender sensitivity, sexual relationships, sexuality, and healthy sexual behavior, we developed a story that reflects the mission and quest for sex education. It included leaderboards, time limits, and levels, and also utilized mechanics such as points and items. Edutech tools include video content, Google Sheets, Zoom, Padlet, and Mentimeter. **Conclusions:** This study aims to improve learning effectiveness, satisfaction, and immersion by developing a sex education program for youth using gamification that promotes active learner participation and motivation.

Keywords: Gamification, Sex education, Edutech, Ethics, Youth

JEL Classification Code : I14, I19, I25

1. Introduction

In Korea, the number of sexual crimes is continuously increasing, and crime patterns are becoming more diverse (Ministry of Gender Equality and Family, 2022). According to crime statistics from the National Police Agency, from 2015 to 2019, victims of rape and forced molestation were concentrated among men and women in their 20s. Most people in this age group are college students when they are legally adults. This is the time when adolescent sexual

interest, which had been suppressed due to studying and entrance exams, is released and full-fledged romantic relationships begin. In their 20s, when sexual crime victims are concentrated, college students who do not have proper awareness of sex and have low awareness of the seriousness of sexual crimes are likely to become victims of sexual crimes (Busan Women and Family Development Institute, 2021). Meanwhile, various changes are occurring in Korean society due to the development of the digital media environment, and problematic phenomena such as deviance

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and crime are appearing in the teenage group, especially due to changes in values, attitudes, and behaviors toward 'sex' (Lee, 2023). Today's teenagers are a generation familiar with digital use and it is an important time to form values about sex. Therefore, if these two conditions and the environment are not maintained healthily, the category of digital use will be linked to crimes against sex, resulting in a new deviant crime called digital power-type sex crime. (Park, 2020). In this way, to prevent and cope with sexual problems that are evolving and increasing from teenagers to those in their 20s along with digital development, it seems very important to provide appropriately and effectively developed sex education for teenagers or college students.

Sex education helps adolescents establish sexual knowledge appropriate for their growth and development, as well as correct attitudes and values regarding sex, thereby sublimating their sexual desires, improving their problem-solving abilities, and helping them grow into healthy members of society and lead happy lives. It can be said (Jeon, 2021). Because school sex education is education provided for the benefit of the entire society, such as the freedom and safe lives of children and adolescents, it should be open to everyone so that they can receive systematic education on universal content, and the benefits that emerge as a result of sex education should also go to everyone. However, despite social sympathy and educational implementation of the importance of sex education, youth's sex-related problems continue to occur, and new aspects are increasing (Lim, 2023). If correct values and adult awareness of sex are not established during the youth and early adult college years when sexual development takes place, indiscriminate and violent crimes related to sex will continue to increase, and problems such as digital sex crimes, which have recently become an issue, will become even more serious. It will cause problems.

Meanwhile, gamification is a process that uses game thinking and mechanics to induce user interest and promote participation. It provides intrinsic motivation to users and encourages active participation through game techniques and elements in a non-game context. This is a method that can promote fun and immersion (Kwon & Woo, 2013). The biggest educational effect of gamification is that, above all, it gives learners interest and motivation in learning through fun and immersion, and promotes active participation in learning (Baek & Kim, 2005). Recently, the effectiveness of gamification has been reported in learning various social and emotional aspects such as morality and ethics (Lee, 2021), and the fun elements of gamification have been added to the sensitive and serious field of sex education. It is believed that developing educational content can have a positive effect on the approach and application of sex education for digital generation teenagers or college students. To prevent and respond to sexual crimes and

sexual problems related to adolescents and college students, which are becoming more serious in various ways with digital development, a form of sex education that consists of the right approach and content and is effective for the target must be developed and applied. It is believed that the development and application of a sex education program using gamification as a more effective method for youth, who are referred to as digital natives and are exposed to sexual crimes in the digital virtual world, will be a very meaningful task.

2. Literature Review

2.1. Domestic Youth Sex Education

School sex education for elementary, middle, and high school students in Korea is governed by the Basic Education Act, the School Health Act, the Framework Act on Gender Equality, the Act on the Prevention of Sexual Violence and the Protection of Victims, and the Act on the Prevention of Prostitution and the Protection of Victims, and Act on Sexual Protection of Children and Adolescents, etc. It is based on related laws. Sex education can be broadly divided into 1) biological-based sex education, 2) gender equality education, 3) sexual violence prevention education, and 4) gender awareness education (Jang, 2023). In Korea, the Ministry of Education sought to systematize sex education in 2015 by enacting the "National School Sex Education Standard." The sex education aimed at the Ministry of Education's standard does not emphasize only the biological aspect of sex or presents sex education as a part of the subject matter but as a comprehensive and comprehensive concept. However, many organizations say that the Ministry of Education's standard does not comprehensively address the concept of sex and is fragmented and, criticism was raised that it was reinforcing distorted notions about sex (Korea Sexual Violence Relief Center/Korea Women's Hotline, 2015). In this situation, as a new alternative to the existing standards, UNESCO (United Nations Educational, Scientific and Cultural Organization, UNESCO) is proposing a comprehensive guideline on sexuality education (International Technical Guidance on sexuality education, 2018; hereinafter referred to as the guideline), and sex education refers to sexual education. It differs from the basic perspective on sex education by viewing it as education that encompasses experiences related to sex throughout one's life, rather than education about oneself. Accordingly, if sex education through school education in Korea is defined as comprehensive sex education beyond the existing perspective and understanding sex education based on specific guidelines, the purpose, content, and methods of sex education for youth in institutional education should be

included. It is suggested that it will help seek future directions (Lim, 2023).

Despite continuous efforts on sex education, awareness of problems, and proposals for specific directions, the current situation related to domestic sex crimes is steadily increasing not only in frequency but also in severity and diversity, and sex education to prevent, solve, and respond to these issues is continuing. Related studies are also consistently reported. A study by Jang (2023) presented problems with Korea's school sex education and a plan for introducing Korean-style sex education, since school sex education was implemented in Korea, controversies over the lack of a school sex education promotion system have continued, which is a sign of the times. It was believed that it was reinforcing gender-related stereotypes that did not suit the changes and was resulting in discrimination and hatred being tolerated. Therefore, strengthening school sex education. It was deemed necessary to research and develop integrated sex education, establish a community delivery system to improve awareness, train certified sex education instructors, and enact related laws. In a study by Bu and Kim (2022), they analyzed the effects of nursing students' teaching experience of providing sexual harassment prevention education to elementary school students on gender equality awareness, awareness of sexual harassment, and sexual harassment behavior compared to lecture-style education, and analyzed the effects of sexual harassment prevention education on sexual harassment prevention education. We sought to confirm the applicability of 'Learning by teaching' as an appropriate teaching-learning method. A study by Shin et al. (2020) attempted to 'comprehensively examine sex education programs for college students in Korea', and as a result of previous research, sex education provided in middle and high schools is mandatory for 10 hours per year; Because it is less effective and does not provide enough useful and practical information that students need, there is a need to provide sex education with more specific and practical content that meets the needs and demands of college students. It was assumed that there would be. In addition, the attributes and characteristics of the sex education programs currently provided for college students are as follows: First, most intervention programs provided education on sexual knowledge and sexual attitudes, and second, there were differences in the demand for sex education between genders. In other words, while female students scored higher in sexual knowledge, male students were more open in sexual attitude, so differentiated education based on gender should be provided. Third, a program that provides long-term education over a certain period rather than one-time education is needed. It was effective, and fourthly, it was found that when relational and social sex was added to education in addition to biological sex knowledge, it was

effective in terms of overall sexual knowledge, sexual attitude, and communication.

Looking at the results of these previous studies, sex education programs for youth are continuously being provided, but there are still problems with their effectiveness, and the development of a sex education program composed of effective methods and learning content that reflects the current social context and characteristics of youth is considered necessary.

2.2. Education Using Gamification

In general, education gamification is a form of reflecting game elements to achieve educational purposes, while game-based learning (GBL) turns the educational content itself into a game. In other words, educational gamification aims to achieve educational purposes through an approach that adds game elements while maintaining most of the existing overall learning process, while game-based learning is an approach in which learners learn something while playing games. It is also used as a functional game concept as a means to increase interest in (Kim, 2023). In a study by Ahn et al. (2020), who attempted to 'systematically analyze the literature on domestic game-based learning and educational gamification design research', game-based learning (game-based learning (GBL), educational game), serious games and gamification (gamification, gamification, educational gamification) were divided into major categories. In addition, information on game-related components explained by various scholars was provided. Based on the content summarized in Ahn et al.'s (2020) study, Lee (2023) divided the representative components and techniques used in gamification into five elements such as achievement, reward, motivation, competition, and relationship, as well as points and levels reorganized into mechanics such as badges, medals, missions, quests, leaderboards, rankings, communities, and gifts.

Recently, with the development of digital edu-tech, research, education, and business related to gamification have increased at a tremendous rate. In a study by Ahn et al. (2020), among studies on the educational use of domestic games, the purpose was to identify trends in design. A systematic literature review was conducted, and the results showed an increasing trend since 2015, with a particularly large increase since 2018. In addition, in terms of learning topics, research was most active in the CS/IT field, and major research was conducted in areas such as language, health/safety, and management/economics, and game mechanics were mentioned in game-based learning or educational gamification. In the study, it was analyzed that the boundary between educational gamification and game-based learning, such as when designing game content, is blurred and the two concepts are used interchangeably, so

additional research appears to be necessary for a clear understanding of this. A study by Jo (2023) analyzed recent cases of fashion gamification platforms and sought to understand their implications. The types of gamification in fashion platforms were classified into classic action game platforms, role-playing game platforms, and NFT/AR game platforms. It has been done. In addition, various game mechanism elements and gamification characteristics appeared on each platform, and the characteristics shown in fashion gamification were that goals/challenges, rewards, and achievements were common among game mechanism elements, and the fashion gamification derived from this. The implications were analyzed as the realization of the desire to own luxury fashion, the realization of ideal fashion styling through multi-personas, and the realization of human creative desires as fashion creators. Lee's study (2021) attempted to 'develop a gamified lesson design model and guidelines for higher education', and to lead learner-led classes more successfully, active participation in learning and learning motivation to continuously maintain learning were attempted. , self-efficacy, communication, interaction, etc. must be considered, and the gamification method of applying game mechanics (structure, rules, elements, etc.) to classes to induce learner motivation and immersion is effective, so for this purpose, A systematic instructional design model, design principles, and guidelines were developed.

Considering recent research results such as these, applying gamification, which is reported to increase learners' active participation and motivation, to sex education programs for adolescents is predicted to be an effective method for improving learning effectiveness, satisfaction, and immersion. It could be possible.

2.3. Sex Education Using Gamification

In Korea, research in the field of sex education using gamification is very insufficient, but a study by Lee and Bang (2023) attempted to 'propose VR sex crime prevention education game content centered on the use of self-defense products.' By analyzing examples of realistic content at home and abroad and factors of learning effectiveness, students' practical education is focused on experiential education through immersion in the situation and repetition through interaction between 'content' and 'subject' that can promote learning participation and effectiveness. We proposed the development of new realistic educational game content under the theme of 'sexual crime prevention education', a blind spot in education. Learning by using VR educational tools, we develop realistic sex crime prevention education game content to provide education on actively overcoming sex crime situations, identify problems with the

current sex crime prevention education, and experience the game with a focus on high school and college students. Afterward, through user experience evaluation and satisfaction interviews, the immersion of education and the effectiveness of the game as realistic content were identified. The experimental class consisted of a first theoretical class and a second VR experience class using the Ministry of Gender Equality and Family's sexual crime prevention education and focused on the importance of actively overcoming situations and the correct use of self-defense equipment. As a result of the study, positive interactions between users and games were identified in terms of 'usability', and positive evaluations were made regarding the promotion of active participation through content and the learning effect in terms of 'usability'. In terms of 'emotion', persistence in learning and willingness to learn were confirmed in terms of immersion, interaction, fun, and satisfaction.

Recently, gamification has been applied in a wide range of educational fields, and many studies have actively reported its effectiveness. However, there is still very little research on the effectiveness of applying gamification in sex education programs. However, it can be predicted that developing a program using gamification in the operation of sex education, which is reported to lack immersion in realistic situations, positive motivation, and active participation, can have a very positive effect. Accordingly, this study attempts to develop a sex education program using gamification for adolescents.

3. Research Methods and Materials

The development process for a sex education program for youth using gamification is as follows. First, the education target and education environment(remote) were selected. Second, to identify educational goals and learning contents, we analyzed related literature, including UNESCO's sex education guidelines published in 2018, Korea's sex education-related policies, and national-level school sex education standards. Third, the goals and learning contents of sex education were structured based on Dick and Kerry's teaching system design model. Fourth, considering the educational goals and learning contents, the components of gamification, such as dynamics and mechanics, were reflected. Lastly, a specific lesson plan (draft) was developed using the gamification lesson design model proposed in the study by Lee (2021).

Table 1: Research Methods and Materials

1. 'Theoretical framework of sex education' for youth sex education programs
- School sex education for elementary, middle, and high school students in Korea is the 「Basic Education Act」, 「School Health Act」, 「Framework Act on Gender Equality」, 「Act on Prevention of Sexual Violence and Protection of Victims, etc.」, 「Prevention of Prostitution and Protection of Victims, etc. Based on related laws such as “Law”, “Act on Sexual Protection of Children and Adolescents”, etc. - Refer to the International Technical Guidance on sexuality education (2018) distributed by UNESCO. - Refer to the “National-level school sex education standard” established by the Ministry of Education in 2015. - Refer to the main contents of existing sex education (Jang, 2023) 1) Biological-based sex education, 2) Gender equality education, 3) Sexual violence prevention education, 4) Gender awareness education ▶▶ Selection of appropriate learning topics for non-curricular distance learning (4th session) for first-year high school students
2. 'Teaching and learning design strategy to strengthen learning motivation' for sex education programs
- Dick and Kerry's Instructional System Design Model (8th revision since 1978), translated by Kim(2016), Systematic Instructional Design ▶▶ Initial development of a youth sex education program utilizing gamification according to teaching and learning design strategy
3. 'Gamification components and design strategy' for gamification utilization programs
- Framework for educational gamification; Story, Dynamics, Mechanics, Technology - Dynamics of the game; Fascination, challenge, competition, completion, control, discovery, exploration, self-expression, fantasy, camaraderie, nurturing, relaxation, sadism, sensation, simulation, subversion, suffering, empathy, thrill, etc. - Game mechanics; Rewards (points, levels, progress indicators, badges, privileges, virtual items, disconnections, gifts, virtual currency), avoidance (demotivation, leaky rip-offs), leaderboards (macro leaderboards, micro leaderboards, indirect competition, direct competition), quests (unlocking, countdown, lottery, joint discovery, scaffolding), etc. - 8 steps of gamification development strategy (Kim, 2017) ▶▶ Selection of appropriate mechanisms for youth sex education programs
4. 'Gamification lesson design model' for 'gamification-based sex education program'
- Application of 'Gamification Instructional Design Model for Higher Education' (Lee, 2021) ▶▶ Develop a specific plan for a sex education program using gamification according to the gamification class design model
<pre> graph TD subgraph Analysis NA[Needs Analysis] LA[Learner Analysis] CA[Content Analysis] EA[Environment Analysis] end subgraph GMD [Gamified Mechanics Design] G[Goal] subgraph Narrative N[Narrative] end subgraph RI [Relationship Interaction] F[Feedback] end subgraph CC [Competition Cooperation] P[Point / Item] end subgraph MQ [Mission / Quest] M[Mission / Quest] end L[Leaderboard] end subgraph Dev [Development] ED[Evaluation Development] RD[Resource Development] end subgraph IE [Implementation & Evaluation] E[Execution] SE[Summative Evaluation] end EDI[Edit lesson design] Analysis --> GMD GMD --> Dev Dev --> IE IE --> EDI EDI --> GMD </pre>

4. Results

‘The sex education program for youth using gamification’ derived according to the research method is as follows. It consists of 1. subject analysis and planning, 2. game mechanics design, and 3. teaching and learning process guidance plan.

This program, developed based on prior literature such as UNESCO's (2018) comprehensive sex education guidelines, Dick and Kerry's teaching system design model, and Lee's (2021) 'Gamification Instructional Design Model for Higher Education', has the following features: It has characteristics. First, despite the operation of the national sex education curriculum, controversy over its effectiveness continues due to various factors, and core sex education

topics (gender sensitivity, sexual relationships, sexuality, healthy sex) are taught through non-curricular distance learning. Action) was selected and approached to increase the effectiveness of education. Second, considering the characteristics of sex education that may not meet the needs of learners, contrary to the setting of educational goals, gamification that can increase learning motivation, interest, and participation is applied to increase the effectiveness of education. wanted to raise it. Third, based on Lee's (2021) model developed to provide specific guidelines when designing classes using gamification in higher education, gamification (narrative, challenge, competition, Cooperation, achievement, reward, relationship, feedback) was intended to be applied to the content of sex education classes.

Table 2: Development of a sex education program for youth using gamification

1. Subject analysis and planning	
1. Learning content analysis plan	
Subject name /Learning target	Sex education program (non-curriculum distance learning)/1st year of high school
Educational Goals	1. Cultivate correct awareness of the differences between men and women and gender sensitivity required of adolescent high school students. 2. Cultivate correct awareness of intimate and sexual relationships required of adolescent high school students. 3. Cultivate correct awareness of body image and complex sexuality required of adolescent high school students. 4. Cultivate correct awareness of healthy sexual development and sexual behavior required for adolescent high school students.
Class contents	1st session; Understanding gender differences between men and women and gender sensitivity 2nd session; Recognizing correct attitudes toward intimate and sexual relationships 3rd session; Understanding body image and complex sexualities 4th session; Understanding healthy sexual development and sexual behavior
Gamification Goals	Positive motivation for learning, active participation, collaborative learning experience
2. Instructional design analysis plan	
Expected effects of gamification teaching strategy	In a sex education program for male and female high school students, we design game elements and mechanics through systematic lesson design such as missions and quests, and provide active, cooperative, and active learning activities through gamification strategies that help understand learning content. It promotes effective achievement of class goals.
3. Learner Analysis Plan	
Characteristics of learners as players	As students were born and raised in a digital environment, it is predicted that the majority of students have been exposed to basic game elements and understand game elements such as missions, quests, points, leaderboards, narrative stories, characters, relationships and cooperation, and He also has experience with tech tools such as Google, Zoom, Padlet, and Mentimeter. There may be differences between men and women, but since the competitive game element is not significant, it will be taken into consideration when forming a team.
4. Learning environment analysis plan	
Operation environment/tools	Personal computer or laptop, LMS or Internet/ E-learning class videos, LMS or Google sheet, edu-tech tools (Padlet, Mentimeter)
2. Game mechanics design	
1. Gamification Mechanics Design	
1) Narrative: Cover Story Design 2) Challenge Mechanics ① Mission design ② Quest design to reach the mission 3) Leaderboard design for competition and cooperation ① Leaderboard design using Google Sheets: Easy access for students by distributing shared URL It is designed so that you can check your point accumulation status, next challenge, and route to the final quest without logging in on mobile or PC. Class activity points and quest clear points are designed to be checked separately (quest points reflect assignment scores) 4) Compensation system design ① Class participation points are accumulated and used to purchase items. ② LXP (learning experience points) earned upon successful quest are reflected in the assignment score. 5) Relationship/feedback design ① Relationship; Design of cooperative interaction activity structure for mission resolution ② Feedback Strategy	
2. Class operation and tool rules	
1. Points (LXP) earned by clearing quests are reflected in the task score. 2. Points earned through active participation during classes can be used to purchase items. 3. Feedback outside of class hours is provided in open group chat rooms/bulletin boards. 4. Quest must be submitted during class time.	
leaderboard	Using the Google Sheets leaderboard, points are posted when quests are cleared.
Item card	The item card selected when accumulating points cannot be transferred to another person.
Padlet	Padlet will be used during each team's presentation. (https://padlet.com)
Mentimeter	Mentimeter will be used during class time (http://menti.com) Open chat rooms will be used outside of class hours.
3. Evaluation plan	

Assessment Methods	points	Detailed evaluation criteria
Mission Quest Achievement	50	Reflection of LXP paid when quest goal is achieved in mission
Quiz	10	Check prior learning and quiz
Assignment presentation	20	Level 3 (8-10 points): Content organization centered on key content, clear presentation Level 2 (5-7 points): There are some shortcomings in content organization and presentation. Level 1 (1-4 points): Content organization and presentation are inaccurate.
Attendance	10	1 point deducted for one absence
Participation	10	Reflection of evaluation based on attitude and level of effort

3. Teaching and learning process guidance plan (1st session)

Subject	Youth sex education to improve proper adult awareness		Lesson/Unit	1/4	
Unit name	Differences between men and women and gender sensitivity		Target	high school student	
Topic	Understanding gender sensitivity for male and female students		Class type	Distance learning	
Goal	Understand gender differences between men and women and gender sensitivity.				
Challenge / Mission	Level 1	Understand the differences and discrimination between men and women	Quest	level 1	Investigate and share cases of discrimination between men and women
	Level 2	Understand gender sensitivity		level 2	Analyze and share your gender sensitivity
Main activities	Explain the differences and discrimination between men and women with examples. Analyzing and explaining one's gender sensitivity		Activity unit	team	
Teaching strategy	Investigate cases of discrimination between men & women and create a network of thoughts using Padlet Analyze your gender sensitivity and create a thought network using Padlet				
Learning materials	Sex education class materials and padlet usage guide				
Learning step	Main activity	Teaching and learning activities	learning experience	Time	Tool
Introduction	Motivation	Watch a brief video about the differences between men and women	-	5	e-learning
Deployment	Lecture	Class contents lecture	-	10	
		1. Introduction to class content, Padlet guide, confirmation of prior learning 2. Explanation of differences and discrimination between men and women 3. Description of gender sensitivity			
Apply	Activity 1	Quest1. Understanding the differences and discrimination between men and women	2LXP	15	zoom / Padlet
		1. Investigate differences and discrimination between men and women 2. Non-face-to-face real-time ZOOM small group meeting room Communicate and share and present research cases on differences and discrimination between men and women by team 3. Access Padlet and create a network of thoughts on the topic of differences between men and women.			
Organize	Activity 2	Quest2. Understanding gender sensitivity	2LXP	15	
		1. Analyze your own gender sensitivity 2. Non-face-to-face real-time ZOOM small group meeting room Communicate and share and present gender sensitivity analysis results for each team. 3. Access Padlet and create a network of thoughts on the topic of gender sensitivity.			
Organize	Activity 3	Quiz (multiple-choice quiz related to class content)	2point	3	Mentimeter
	Summary	Study summary and next meeting notice	-	2	-

5. Conclusions

Despite social awareness of the importance of sex education and national education, the severity of youth sex-related problems is increasing. If correct values and ethical awareness of sex are not established during the teenage and college years when sexual development takes place, this may cause more serious social problems in the future. Meanwhile, although compulsory youth sex education programs are being implemented, controversy persists that they are less effective and that useful and practical information that students need is not being provided (Jang, 2023). Accordingly, this study sought to develop a sex education program that takes into account effective educational content and operation methods for youth, referring to UNESCO's Comprehensive Sex Education Guidelines.

Based on the literature review, four topics such as gender sensitivity, sexual relationships, sexuality, and healthy sexual behavior that were considered important for adolescents were selected and consisted of non-curricular distance learning. It was found to be particularly effective in improving satisfaction and immersion in education. An attempt was made to increase learners' active participation and motivation by utilizing gamification, which is becoming a reality. Recently, the effectiveness of gamification has been reported in learning various social and emotional aspects such as morality and ethics (Lee, 2020), and the fun elements of gamification have been added to the sensitive and serious field of sex education. It is believed that developing educational content can have a positive effect on the sex education of youth, the digital generation.

There is still very little research on the effectiveness of applying gamification to sex education programs, but developing a program using gamification in sex education, which is reported to lack actual immersion, positive motivation, and active participation, can have a very positive effect. It can be predicted that it can bring. This study refers to the 'Gamification Instructional Design Model and Guidelines for Higher Education' developed in the research of Lee (2021), developed a story reflecting the missions and quests for each topic in the fourth session, and developed a leaderboard. The program was constructed using mechanics such as time limits, levels, points, and items, and using ed-tech tools such as video content, Google Sheet, Zoom, Padlet, and Mentimeter. This 'sex education program using gamification', which analyzes learner needs and is structured based on systematic gamification lesson design models, design principles, and guidelines, promotes youth's immersion and interest in sex education and increases satisfaction and effectiveness. It is believed that this will contribute to operating desirable sex education.

As seen, this study selected key sex education topics

targeting adolescents for whom sex education is considered to be of great importance and utilized gamification based on the gamification lesson design model and guidelines for higher education (Lee, 2023). In developing a sex education program, we tried to provide basic data for effective sex education, but it has the following limitations, so we would like to make a suggestion. First, the learner analysis was planned based on the general characteristics of adolescents, but since there may be differences depending on grade, gender, and social characteristics, it is recommended to conduct a specific and detailed learner analysis. Second, since the sex education method will utilize video content, real-time teleconferencing (Zoom), and educational teaching tools (Padlet, etc.), effectiveness may vary depending on the learner's level and class environment related to digital literacy, so this must be carefully studied.

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