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The Suggestion of a Mountaineering and Trekking Convergence Education Course Using AI

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Abstract

Purpose **–** In Korea, where 64% of the land is forested, mountaineering is a leisure activity enjoyed by the majority of the people. As new technologies named the 4th industrial revolution spread more after the Covid-19 pandemic, we propose a human and technology convergence curriculum for mountaineering and trekking education to enjoy safety in the field of mountaineering and trekking using cutting-edge technology.

Research design, data, and methodology **–** After examining the current state of the mountaineering industry and preceding studies on mountaineering and camping, and learning about BAC the 100 famous mountains, mountaineering gamification, and Gamification We designed an AI convergence curriculum using.

Result **–** Understanding the topography and characteristics of mountains in Korea, acquiring mountaineering information through AI convergence, selecting mountaineering equipment suitable for the season, terrain, and weather, setting educational goals to safely climb, and deriving term project results. A total of 15 A curricula for teaching was proposed.

Conclusion **–** Artificial intelligence technology is applied to the field of mountaineering and trekking and used as a tool, and it is expected that the base of mountaineering will be expanded through safe, efficient, fun, and sustainable education. Through this study, it is expected that the AI convergence education curriculum for mountaineering and trekking will be developed and advanced through several studies.

Keywords: Mountain, Convergence education, AI, Gamification, Mountaineering, Trekking, Tranggle

JEL Classification Code: I12, I21, I29

1. Introduction

The Republic of Korea is a world-class forest country with a forest area of 6,298,000 ha out of a land area of 10,041,000 ha, ranking 4th among OECD countries (Korea Forest Service, 2020). (Finland 73.7% > Sweden 68.7% > Japan 68.4% > South Korea 62.7%)

Mountaineering is a representative leisure activity in Korea because citizens living in cities can easily access mountains. Since the pandemic, restrictions on indoor activities have increased the number of hikers. Among all adult men and women aged 19 to 79, the population who climbs or treks at least once a month (including once or twice a month) is about 31.69 million, accounting for 77% of the total adult men and women. The outdoor population increased by 6%p compared to 15 years (63%) and 18 years (71%) (Korea Forest Service, 2022).

The good thing about mountaineering is that you can project the difficulties you encounter while climbing a mountain and the emotions you feel while overcoming them into your attitude toward life. Legendary mountaineer Albert Frederic Mummery once said, “The problem is the attitude, not altitude. The essence of mountaineering is not to climb to the top, but to fight hardships and overcome them.” After a few uphills and downhills, you reach mastery, where steep climbs are the foreshadowing of restful descents.

As the population of mountaineers increases, accidents related to mountaineering also increase. According to the 2021 Disaster Yearbook, the number of accidents in 2021 by type of accident managed by local governments is 6,496 in mountaineering, and in the case of the number of deaths, 85 are the highest among all types, but in the case of the number of injured, mountaineering is the most with 4,057. Aggregated (Ministry of Public Administration and Security, Disaster Yearbook, 2021). As such, mountaineering is the closest, but never safe, leisure activity. Modern technology has GPS, altitude, and navigation functions if you have only one cell phone, so if education is done well, accidents leading to injury or death can be prevented. Using the GPS exercise app Tranggle, you can prevent deviation from the route even in rough mountains, and you can finish mountaineering before sunset by setting the sunset time. As such, we propose a 15-week liberal arts course centered on gamification with the theme of mountaineering for first-year college students who are interested in mountaineering but do not have basic knowledge.

The structure of this study is as follows. In Chapter 2, the status of the mountaineering industry in Korea, the National Mountaineering School education program, and the gamification of mountaineering are examined, and in Chapter 3, the design of the curriculum is explained. In Chapter 4, the curriculum is presented, and in Chapter 5, the differentiation of the curriculum is asserted. Chapter 6 presents the significance and limitations of this study.

2. Literature Review

2.1. Mountaineering Industry Status

According to a press release by the Korea Economic Research Institute (2016), it was said that the promotion of the mountaineering tourism business would create an effect of creating 25,000 jobs according to the mountaineering tourism promotion bill submitted by the government in 2015 (Korea Economic Research Institute, 2016). In addition, to revitalize the mountaineering tourism business, it is necessary to ease regulations on wildlife protection areas to the extent that the basic spirit of nature conservation is not violated. At a seminar hosted by the Korea Economic Research Institute in January 2016, he emphasized the positive effect of the Mountaineering Tourism Promotion Act, saying that mountaineering tourism is valuable as a strategic development project for economic revitalization and new growth engines. It was discarded due to the expiration of the term, but in February 2017, National Assembly member Hong Moon-Pyo proposed again the 'Act on the Designation and Management of Mountaineering Tourism Promotion Zones to Revitalize Mountaineering Tourism' (Hwang, 2017). In addition, the Ministry of Strategy and Finance (2017) suggested 'measures to activate mountaineering and camping', saying that the lack of mountaineering and camping infrastructure that is easy for the public to access near cities and the lack of capacity to accommodate shelters in the highlands of national parks cause inconvenience to the public. Measures were prepared as shown in <Table 1> (Ministry of Strategy and Finance, 2017).

As described above, the 'measures for revitalizing mountaineering and camping' utilize forest resources to create a base for mountaineering and camping, expand the capacity of shelters at high altitudes, and improve the environment. A loan support plan is included through the comprehensive project fund.

Table 1: Government Investment Promotion Measures to Promote 'Mountaineering and Camping

Division	Promotion Contents
Mountaineering and Camping	· Establishment of a sound camping culture by utilizing forest resources to create a base for mountaineering and camping, strengthening safety management, and expanding educational programs
Mountaineering and camping base	· Expansion of campsites in forests and national parks near cities, maintenance of highland shelters and mountaineering trails
Conditions Furtherance	· Expansion of base for mountaineering and camping using forest resources · Loan support through forest business fund for the creation of forest campsites where accommodations can be accommodated in recreational forests (2017.4.4., Korea Forest Service) · To create a mountaineering environment for residents and camp dogs, mountaineering trails are continuously maintained, shelter capacity is expanded and the environment is improved (2017.3.4., Forest Service and Ministry of Environment). · Highland shelter capacity: 20 places/1,491 people in 2016 → 24 places/1,940 people in 2020 · Shelter environment: widening bed width (60cm → 80cm or more), maintenance of old facilities

Source: Ministry of Strategy and Finance (2017), Investment Promotion Measures at the 11th Trade and Investment Promotion Conference P39~P40

The United Nations World Tourism Organization (UNWTO) 'Mountaineering Tourism Conference' was held in Ulsan in 2015 in the Yeongnam Alps. Ulsan Metropolitan City plans to invest KRW 530 billion by 2019 to create a complex welcome center, an international climbing center, a sky reed trail, and a starlight campsite with a plan to develop Ulsan as the number one destination for mountaineering tourism. ' was completed in 2019. In addition, Ulsan City has developed a tourism product that integrates Ulju-gun, Yangsan-si, Gyeongju-si, and Miryang-si to connect natural resources such as mountaineering, trekking, and valleys centered on mountain resources, villages, culture, and local resources in the Yeongnam Alps (Korea Economy Researcher, 2016). The reason why local governments are actively developing mountaineering tourism programs is to revitalize the local economy and create new jobs. The tourism industry is a key sector for creating new jobs, and according to the Ministry of Culture, Sports and Tourism, 2.5 million new jobs have been directly created in the travel and tourism sector (Shin , 2016).
n Korea, there are no mountains over 2,000m above sea level, so climbers who have mastered domestic mountains are leaving for overseas mountaineering tours in search of higher mountains. , 2016).
With the use of the Internet, the number of group mountaineering activities such as recruiting type mountaineering recruited by travel agencies and mountaineering clubs is rapidly increasing.

2.2. National Mountaineering School Education Program

Shin et al. (2016), a study on the development and operation of national mountaineering school education programs was conducted to systematically develop and effectively operate the national mountaineering school education program to be established in Sokcho, Gangwon-do. To achieve this research purpose, research and analysis of educational programs of mountaineering schools at home and abroad and related literature, a Delphi survey targeting mountaineering education experts, and an Internet survey targeting general mountaineers were conducted.

As a result of the study, first, the educational philosophy of the National Mountaineering School was identified as 'nurturing creative mountaineers who combine mountaineering activities and mountaineering culture leading the future forest welfare society'. Second, the areas of mountaineering education were divided into five areas: mountaineering environment and safety, mountaineering technology, mountaineering equipment, mountaineering culture, and mountaineering education, and essential subjects were derived for each area.

Third, by comprehensively reflecting on these results, a total of 30 mountaineering education programs by target and level were developed over the five major courses of safe mountaineering technology, forest education, mountaineering culture, mountaineer training, and mountaineering training. Finally, a useful plan for the effective operation of the National Mountaineering Education Program was presented (Shin et al., 2016).

2.3. Gamification of Mountaineering BAC The 100 famous mountains

'The 100 famous mountains' is a program that climbs 100 representative mountains in Korea. Blackyak Alpine Club(BAC). It is the oldest program of BAC and started its first hike on January 5, 2013.
The 100 famous mountains program is a journey and challenge to find oneself. It is a mountaineering program that strives to make life more valuable by connecting mountains and people. It aims to develop. The 100 Famous Mountains program was selected as famous mountains that can be explored among the representative mountains of Korea and are the oldest program representing BAC. With the recent increase in the mountaineering population, the number of hikers who challenge to climb the top 100 famous mountains has become a more famous program than the 100 famous mountains of the Korea Forest Service, with 164,221 people and 3,592,470 certifications (as of September 26, 2022).

2.3.1. BAC The 100 famous mountains Certification Method

The BAC 100 famous mountains authentication method can be divided into three stages.
Step 1: Install the BAC app.
Step 2: Log in to BlackYak (register as a member), agree to the challenger terms and conditions, and receive an authentication towel.
Step 3: Possession of challenge goods and authentication at the designated place (summit stone) of 100 famous mountains.

Each designated Sherpa authenticates the user's information uploaded through steps 1 to 3, but through the reorganization of the BAC app on January 21, 2021, authentication using existing authentication products, and summit stone GPS authentication, followed by upload. has been reorganized
If the existing authentication method was an individual authentication method by administrators specified as Sherpa, the method using GPS has become a more convenient authentication method by utilizing OCR technology.

Existing authentication method	Authentication method after reorganization
Mountain summit stone/ certified product/ face	GPS/ Summit Stone/ Face

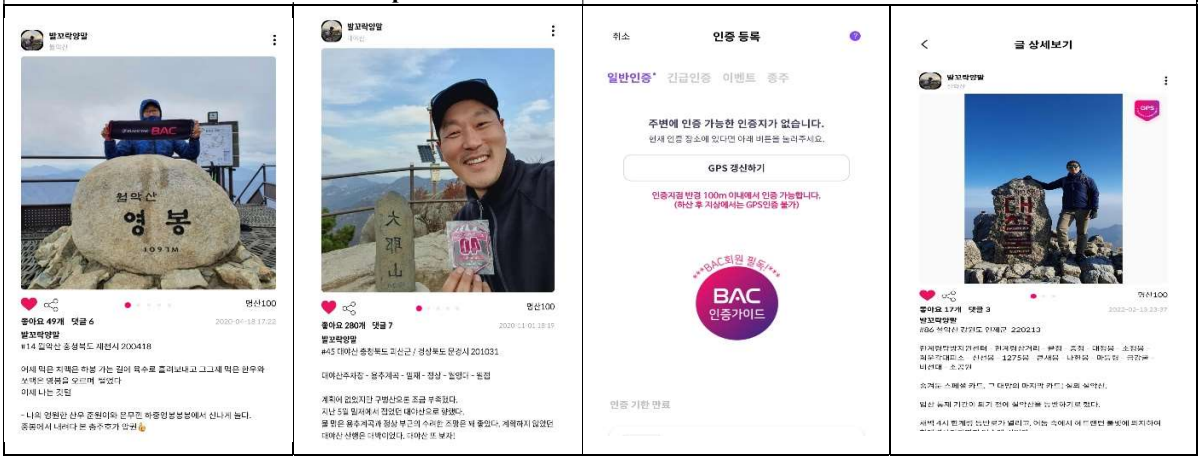

Figure 1: BAC App The 100 Famous Mountains Authentication Method(Source: BAC APP)

2.3.2. BAC The 100 famous mountains Certification Benefits

You can receive a patch for every 10 seats and a certificate of completion for 100 seats, and about 200,000 points (1,950P when signing up, certification height, 10,000 points for every 10 seats) are paid when you complete the race, and you can use the points to purchase products at Black Yak stores or Internet malls. It can be used as cash. If you climb Cheonwangbong peak of Mt. Jiri, one of the 100 famous mountains designated by BAC, upload your GPS and photos, and receive certification, you can accumulate 1,915P as much as the height of Cheonwangbong peak, 1,915m. In addition, BAC includes not only the 100 famous mountains, but also the famous mountains 100+, Baekdu Mountain range, Nakdong Mountain range, Island & Mountain 100, Hanbuk Mountain range, Hannam Mountain range, Hannam Geumbuk Mountain range, Geumbuk Mountain range, and seasonal challenges. You can receive various points or

products by operating programs.

Figure 2: Patch and BAC Points Screen(Source: BAC APP)

2.3.3. Game Elements of BAC The 100 famous mountains

BAC the 100 famous mountains satisfy all three elements of gamification: competition/achievement, reward/relationship, and fun elements of the challenge.
First, BAC the 100 famous mountains induce competition among members through an app called BAC, and you can feel a sense of accomplishment with a clear goal of climbing 100 seats.
Second, rewards are received by accumulating patches and points for every 10 places, and relationships between members are formed by entering mountaineering information during authentication.
Third, through various challenges such as famous mountain 100 and famous mountain 100+, you can challenge mountaineering and tracking that suits you.
In addition, the clear goal of mountaineering to the top of the top 100 famous mountains, feedback through certification and comments, and the more you climb, the more your physical strength improves, which exactly matches the conditions for immersion that American psychologist Mihaly Csikszentmihalyi says.
BAC is a successful model of outdoor gamification that can be applied to other leisure activities.

2.4. Camp Curriculum

As life in the city becomes increasingly complex and busy, each person has a strong tendency to miss nature, and the desire is instinctively getting stronger. In particular, today's children, who are overprotected in the hotbed of school and home, have a healthy and strong physique, but are weak and lack patience, and cannot cope with rapidly changing new situations. Therefore, when we see the reality of children who are weak in overcoming difficulties of injustice and who fearfully avoid the scene or get frustrated when faced with a difficult problem, improvement is urgently needed, and a prescription for normal recovery is urgently required. It has reached the point where regular school education, as well as refined and sound emotional education, character education through tough self-denial training, and understanding and cooperative lifestyle through group training, are necessary for children with infinite potential. This kind of education can achieve the desired result not only in the relationship between teachers and students in the standard school, but also in activities that breathe a lot of air outdoors, listen to the sound of mountain birds and flowing water in the lush forest, and spread the spirit. There will be.
This is because outdoor activities are the best means to train their lifestyle and have educational significance for holistic education. Camping education activities in the great outdoors play an important role in restoring true humanity and youthful health, which are gradually being lost in modern people's lives, and cultivating a sound and desirable personality and mind. In particular, camping is realizing the word ‘learning by doing’, with minimal equipment and educational methods in the great outdoors, which are difficult for school education today. This is the value of education

in terms of fostering more useful, sound, and fulfilling citizens (Lee 1999).

3. Methodology: Curriculum Development Strategy

Mountaineering is climbing a mountain for exercise, exploration, or leisure use. It is a leisure sport that can satisfy the desire for conquest by responding to changes in nature, using and coping with nature, and overcoming given obstacles (Wikipedia). Trekking is a walking tour through mountains and valleys to train the mind and body. It is an intermediate form between mountaineering and hiking, walking 15 to 20 kilometers a day, and living in the camp.
As leisure activities have recently become popular, first-year undergraduate students with potential interest were selected as subjects for liberal arts classes in higher education institutions.

Performing actual mountaineering Through the mountaineering and trekking curriculum, you can decide the location of the mountain you want to climb, transportation, mountaineering course, etc., equip yourself with the necessary equipment, and prepare for an emergency to successfully climb.
Assume that you are the leader of a mountaineering club. However, some members lost their way because they could not find the designated mountaineering route. As a result, the mountaineering club received a request from the mountaineering club to provide training on mountaineering to the mountaineering members before mountaineering. So, as a result of directly observing how mountain members behave, the following problem behaviors were found.
First, there is no information about mountaineering routes.
Second, they did not have the proper mountaineering equipment.
Third, they did not have the adequate physical strength for mountaineering.
Fourth, they did not know how to use a mobile phone's GPS.

Mountaineers learn how to use Tranggle, a GPS application.
You can use the Tranggle to familiarize yourself with designated mountaineering routes in advance and assemble at your destination on time. Arrive at the destination on time and everyone can return home safely.

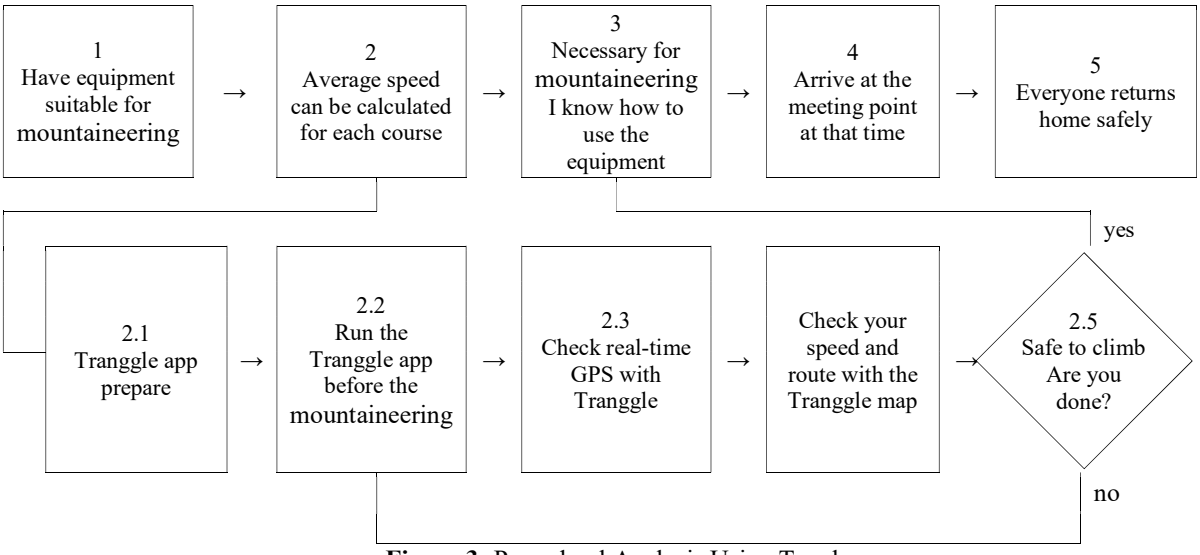

Figure 3: Procedural Analysis Using Tangles

4. Result

This curriculum consists of a total of 15 sessions, and in the first half of the curriculum, the theory and practice of mountaineering are comprised of the 6th session and the term project evaluation to practice writing a mountaineering plan. Term project evaluation is conducted to practice planning.

4.1. Overview of Curriculum Development

The purpose of this curriculum is AI convergence education for first-year undergraduate students who are interested in mountaineering and trekking. The outline is shown in <Table 3>.

Table 3: Curriculum Overview

Subject	Mountaineering and trekking			**Subject code**	210001
Classification of major	Culture [optional]	**Target**	Undergraduate 1st year	**Grades**	2
Education target	-Anyone can easily enjoy mountaineering as a leisure culture. -You can understand the topography and characteristics of mountains in Korea, learn mountaineering information through AI, and choose mountaineering equipment suitable for the season, topography, and weather to climb safely. -You can camp by examining the history of auto camping, camping equipment, and auto camping sites in Korea, and exploring auto camping as a leisure culture.				
Education Plan	-Weeks 1 to 7: Covers the history, environment, technology, and equipment of mountaineering and cases of mountaineering accidents, and learns mountaineering skills through the characteristics of mountains in Korea, how to use the equipment by season (AI convergence), and mountaineering practice. -8~15 weeks: Learn camping skills through the origins of auto camping, how to use tents and camping equipment, and camping practice.				
Textbook and references	-Introduction to mountaineering, Yun (2013), Hyangji Book Publishing -Smart mountaineering, Kim (2013), Haseo Publishing -Mountaineering, Mountaineers (2018), Haenaem Publishing -Auto Camping Bible, Kim (2021), Dream Map -Camping Day, Life Adventurer (2021), Sorosoro				
Related Sites	Refer to lectures for each week				
How to proceed	Lectures, discussions, assignments				
Assessment Methods and points	Evaluation rate: attendance 30%, assignment evaluation 70% (middle/term end)				

4.2. Curriculum (first half)

In the first half, students learn the basics of mountaineering, the basics of mountaineering, health and mountaineering, mountaineering environment and safety, and safe and systematic skills such as mountaineering technology and equipment. Based on this, they experience actual mountaineering and perform the task of creating a hiking plan that leads individual mountaineering groups <Table 4>.

Table 4: Curriculum

	Section	Educational goal by class	Education content by class	note
Weekly lesson plan	1	Class outlines and mountaineering and camping	Introduces lecture objectives, lecture plans, and evaluation methods.	
	2	Basics of mountaineering	Find out the current status and prospects of the mountaineering industry.	

	3	Health and mountaineering	Examine the effects of mountaineering on our bodies and research cases.	
	4	Mountaineering environment and safety	We look at the mountaineering environment and safety accidents in Korea and explore the writing of a mountaineering plan.	*AI Convergence
	5	Mountaineering techniques and equipment	Learn about mountaineering techniques by type of mountaineering, temperature, weather, and equipment by season.	
	6	Mountaineering practice	While mountaineering Mt. Gwanak, they practice maintaining body temperature and using equipment (tangles, etc.).	*AI Convergence
	7	Interim evaluation	Mountaineering plan evaluation	

4.2.1. Utilization and Convergence of AI Technology

Step 1. Gather data

To organize students into groups and select a mountain they want to visit together, guidance is given on how to find various information in the area through Google Earth and the Internet. If there is something to be presented in the project or if there are conditions, the instructor presents some conditions to the students if they use AI (AI trip planner/ Triplt: Travel Planner / Roadtrippers – Trip Planner) and Tranggle. Teach them that they can find the right place for them.

Step 2. Data search and location selection

Instructors teach how to use VR content (Immerse, Immersion VR, Second life) in addition to the existing data search method, and help students conduct due diligence using VR content for the collected information. Instruct students to briefly write their impressions about their actual VR visits, and guide them to use them as a basic step for deciding where to go. The instructor gives time for the group members to share the materials gathered by the students in various ways and allows the students to inform the group members of the methods and contents they have found. After discussing the pros and cons of the candidate places that each person researched, organize them in a table, set the final destination, and post the final destination along with the reason for selection and a brief introduction on a shared platform such as an entry so that the instructor can check it.

Step 3. Making a mountaineering plan

The instructor presents a sample mountaineering plan to the students so that they know the form and content of the plan to be made. To establish a mountaineering plan, the group members discuss the date, schedule, transportation, etc. At this time, the instructor guides them on how to find additional information on the date and characteristics of the area using the AI trip planner. Once the date and schedule are set, Google Streetview is used to find specific hill routes to be visited on the hike, and discuss how the local movement will be performed, the selection of the mountaineering route, and the travel time. Using the AI trip planner, the instructor shows as a sample that various routes, methods, and costs can be derived depending on what criteria students set for the route, and helps students write a plan by presenting various conditions in reality. When the route and detailed mountaineering destination are confirmed through sufficient discussion with the group members, the corresponding details are written in the mountaineering plan and posted on a shared platform such as entry.

Step 4. Mountaineering plan confirmation and feedback

The instructor checks the progress of the students in real-time and pre-sets them on the intelligent platform so that no students submit past the deadline so that guidance messages can be set and transmitted. When the students' final mountaineering plan is sent, the instructor first checks the contents and specifies that it is the instructor's feedback. Depending on the degree of completion of the mountaineering plan the students, it is decided whether to share it with other groups for peer evaluation and feedback outside of the group, and students write peer evaluation and feedback on the final mountaineering plan of the shared other group. The instructor can add additional feedback from the instructor depending on the quality of the collected feedback, and the team members can finalize an improved

mountaineering plan through the feedback of various members (teacher and members of other groups) added to their mountaineering plan help.

4.2.2. Interim Evaluation

Based on the knowledge acquired through the theory and practice classes for a total of 6 sessions, the mountaineering plan to execute mountaineering through AI convergence technology is evaluated, and the indicators are shown in <Table 5>.

Table 5: Evaluation Index (100 points)

Section	Score	Evaluation items
Appropriateness of AI utilization technology	30	▪ Did you properly utilize AI technology to produce a complete result? (Whether to use AI trip planner, Google Streetview, tangle, or entry)
Understanding and adequacy of the plan	30	▪ Do you have an understanding of the mountaineering destination and whether the mountaineering route and schedule are appropriate?
Creativity in planning	30	▪ Have you expressed creative ideas based on the research data?
Accuracy of assignment submissions	10	▪ Did you submit the assignment within the specified deadline?

4.3. Curriculum (second half)

In the second half, theoretical classes focusing on basic contents related to trekking and camping and camping strategies for urban people, such as the origin of camping, camping environment, and safety, tents and camping equipment, auto camping sites in Korea, tent installation methods, and camping recipes, are provided. learn Based on this, they experience actual camping and perform the task of writing a camping plan <Table 6>.

Table 6: Second Half Curriculum

	Section	Educational goal by class	Education content by class	note
Weekly lesson plan	8	Origin of camping	Learn about the history and origins of camping.	
	9	Camping environment and safety	We look at the environment and safety accidents of camping in Korea and explore the preparation of camping plans.	*AI Convergence
	10	Tents and camping gear	Learn about tents and camping equipment by type.	
	11	Auto camping sites in Korea	Find out the current status of auto camping sites in Korea and camping spots by season.	
	12	How to set up a tent	Learn about the basic principles of tent installation and how to tie knots.	
	13	Camping recipes	Explore some of the dishes that are fundamental to camping cooking.	*AI Convergence
	14	Camping practice	Practice how to set up tents, tarps, and various equipment.	
	15	Final evaluation	Evaluation of camping plans	

4.3.1. Utilization and Convergence of AI Technology

4.3.1.1. 9th Session Camping Environment and Safety

Step 1. Gather data

Organize groups of students to investigate cases of camping accidents and safety precautions. In the case of carbon monoxide poisoning, which occurs mainly in winter, instructors teach students that they can find ways to prevent accidents by using the temperature control or carbon monoxide detection function if ICT technologies such as Nest and Sen.se are used.

Step 2. Data search and location selection

Utilizing the VR content taught in the 4th session, students are instructed to briefly write their impressions of their visit to the auto camping site in VR and guide them to use this as a basic step for determining the location. The instructor gives time for the group members to share the materials gathered by the students in various ways and allows the students to inform the group members of the methods and contents they have found. After discussing the pros and cons of the candidate places that each person researched, organize them in a table, set the final destination, and post the final destination along with the reason for selection and a brief introduction on a shared platform such as an entry so that the instructor can check it.

Step 3. Make a camping planner

The instructor introduces apps such as camping maps and campsites to students, makes a camping plan for 2 days and 1 night with group members, and uploads the contents to a sharing platform such as entry.

Step 4. Camping plan check and feedback

The instructor checks the progress of the students in real-time and pre-sets them on the intelligent platform so that no students submit past the deadline so that guidance messages can be set and transmitted. When the students' final camping plan is sent, the instructor first checks the content and specifies that it is the instructor's feedback. Depending on the degree of completion of the students' camping plan, decide whether or not to share it with other groups for peer evaluation and feedback outside of the group, and have students write peer evaluation and feedback on the shared final camping plan for other groups. The instructor can add additional feedback from the instructor depending on the quality of the collected feedback, and the team members can finalize an improved camping plan through feedback from various members (teacher and members of other groups) added to their mountaineering itinerary help.

4.3.1.2. 13th Session Camping Recipes

Cooksy, an artificial intelligence-based cooking assistant, participates in all cooking processes as an AI cooking assistant, guides the cooking process through real-time monitoring, and teaches all necessary information for cooking.

Breaking down this process

Step 1. Access the Cooksy app and search for recipes.
Step 2. Cook according to the instructions for the cooking process.
Step 3. Real-time cooking status is identified through temperature.
Step 4. You can check the cooking status through real-time monitoring.
Step 5. You can share the finished dish on social media.

Evaluate preference by identifying the strengths and weaknesses of the resulting dish through feedback on shared SNS.

4.3.2. Final evaluation

Based on the knowledge acquired through the theory and practice classes of a total of 7 sessions, the camping plan to execute camping through AI convergence technology is the final evaluation, and the indicators are shown in <Table 7>.

Table 7: End-of-Term Evaluation Index (100 points)

Section	Score	Evaluation items
Appropriateness of AI utilization technology	30	▪ Did you properly utilize AI technology to produce a complete result? (Whether to use Nest, Sen.se, Cooksy, etc.)
Understanding and adequacy of the plan	30	▪ Is the understanding of the camping site and schedule appropriate?
Creativity in planning	30	▪ Have you expressed creative ideas based on the research data?
Accuracy of assignment submissions	10	▪ Did you submit the assignment within the specified deadline?

5. Discussion and Conclusion

This curriculum can be an effective and efficient education by converging AI technology with Leisure activities such as mountaineering and trekking. It differs from the traditional curriculum in the following ways.

First, it is an AI convergence education that goes beyond the limits of existing leisure activities. With the educational goal of mountaineering that anyone can easily enjoy as a leisure culture', case study through various video content and AI content (trip planner / Triplt: Travel Planner / Roadtrippers – Trip Planner), VR content, and IOT-based content (Nest, sen.se), it is differentiated in that it enhances students' immersion and understanding, and provides introductory mountaineering education as a liberal arts subject.

Second, education uses gamification elements BAC 100 famous mountains satisfies all three elements of gamification: competition/achievement, reward/relationship, and fun elements of the challenge. Mountaineering education through BAC is an educational process that reflects the game-like fun elements of competition, reward, and challenge, and differentiates it from traditional mountaineering education.

Third, The convergence of artificial intelligence (AI) technology and existing mountaineering theory classes was attempted by writing and practicing mountaineering plans. The technology of mountaineering equipment has allowed mountaineers to reach higher places, but AI technology has a difference in that it allows more people to easily access mountaineering data.

Due to the spread of the Covid-19 pandemic, non-face-to-face education has become commonplace, and new technologies such as AI have been commercialized, leading to changes in the industrial landscape and educational environment. In 2021, South Korea is the 24th largest country in the world with a per capita GDP of $34,983.7. The fact that the number one job consideration for the MZ generation is 'work-life balance', which maintains a harmonious balance between work and life, means that they value their lives as much as their work. In Korea, 64% of the land is forested, and mountaineering is a leisure activity enjoyed by the majority of the people. The era of mountaineering relying on the handkerchief map sold at the trailhead is over. With the development of science and technology, we are living in an era where GPS, altitude, average speed, and route guidance are available with just a mobile phone. It's just that we don't know when or how to apply these technologies.

Through the gamification exercise app Tranggle, you can get directions to Jiri-mountain National Park, and you can share rewards and experiences through BAC. AI trip planner / Triplt: Travel Planner / Roadtrippers – Through Trip Planner, you can make a plan for the desired mountaineering destination and easily share it with others through the entry. This will contribute to pioneering the somewhat dangerous area of mountaineering and trekking. This is the background of planning AI convergence education mountaineering and trekking. The significance of this curriculum is to apply artificial intelligence technology to the field of mountaineering and trekking and use it as a tool, and it is expected that the base of mountaineering will be expanded through safe, efficient, fun, and sustainable education. However, there is a limitation in that the curriculum could not be applied to actual undergraduate students. Through this study, it is expected that the AI convergence education curriculum for mountaineering and trekking will be developed and advanced through several studies.

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