Overcoming the Hurdles of Transition: Middle School Students' Engagement in Distance Instruction During the COVID-19 Pandemic in South Korea[*]

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The study aimed to qualitatively examine middle school students' engagement in distance instruction during the COVID-19 pandemic. The participants comprised 119 students from a girls' middle school in Seoul, South Korea. To gain an in-depth understanding of the students' experiences, we collected their reflective journals, which included structured items about their learning engagement at three timepoints in 2020: April, July, and December. The following are the results: 10 themes and 18 concepts were derived, and they were integrated into causal conditions (sudden transition due to COVID-19), contextual condition (technology readiness, school education context), central phenomena (high level of behavioral engagement, low emotional engagement), interventional conditions (recognizing the potential of online learning, situational awareness about COVID-19 and online learning), action/interaction phenomena (development and use of self-regulated learning strategies), and consequences (changes in practices and perception towards online learning). Based on the findings, engagement patterns of the participants were classified into five types: proactive, conservative, receptive, reactive, passive learners. The present study demonstrated important findings that are essential for the improvement and development of engaging online learning strategies in the future.

Keywords : Distance instruction, COVID-19, Engagement, K-12 education, Qualitative research

Introduction

As COVID-19 has spread worldwide, the majority of schools have been shut down to prevent further infections (UNESCO, 2020). In order to maintain the continuity of education while ensuring the safety of students and teachers, many countries have made an emergency transition from traditional face-to-face classes to distance instruction, which some have dubbed "emergency remote teaching" (Hodges et al., 2020). This refers to a form of teaching that must migrate online owing to a crisis (Bozkurt & Sharma, 2020; Hodges et al., 2020). In contrast to distance teaching activities that are meticulously planned and designed from the outset, distance instruction during COVID-19 represents a transient shift to large-scale distance instruction with little instructional support or predefined resources (Bao, 2020; Whittle et al., 2020).

Korean Ministry of Education [MOE] (2020) defines distance instruction as a class where teaching and learning activities occur at different times or locations. In South Korea, it has never been administered to all students in K-12 public schools on a large scale. Therefore, to ensure adequate learning opportunities, technical infrastructure had to be rapidly developed, deployed, and expanded in every school and household. Learning management systems (LMS), synchronous video platforms, and educational broadcasting systems are a few examples of such infrastructure. Support for low-income students was provided through digital devices and charges for data usage to access distance instruction effectively. However, technological readiness still varies greatly depending on the circumstances of individual households, affecting learning outcomes (MOE, 2020).

In addition to technical support, there is a growing interest in student engagement in distance instruction. As instructors and peers are not physically present in the classroom during distance instruction, learners have more autonomy and must self-regulate their learning; failure to do so can sometimes lead to a decrease in engagement with the learning process (Tuckman, 2007; Rake & Dunn, 2010).

According to research by Kye et al.(2020), during the COVID-19 pandemic, Korean teachers had the most trouble motivating students to learn and encouraging them to engage in distance instruction. Lee et al.(2021) have also noted that teachers perceive encouraging student participation in class as the most challenging aspect of distance instruction.

The present study aims to qualitatively explore middle school students' engagement in online learning during COVID-19. It explores how learner engagement changes over a year under the new social phenomena, COVID-19 and distance education. Our study bridges the gap between distance instruction and engagement research in two main ways. First, there has been a great deal of research exploring the factors that influence learner engagement (Borup et al., 2020; Czerkawski & Lyman, 2016; Dixson, 2010; Hew, 2016; O'Shea et al., 2015; Street, 2010). However, it is necessary to investigate the factors that influence learner engagement under the new distance learning conditions imposed by COVID-19. Second, most prior studies on distance learning have mainly utilized surveys conducted at a single timepoint (Muir et al., 2019). A holistic, in-depth analysis based on qualitative methods is needed to capture the complexity of the phenomenon.

Theoretical Background

Engagement in distance Instruction

In academic settings, engagement refers to the active involvement and commitment of learners to educational practices (Chen et al.,2008; Fredricks et al., 2004; Reeve, 2011). There are different types of engagement that have been identified in the literature. One common typology distinguishes between three main types of engagement (Fredricks et al., 2004; Sun & Rueda, 2012) : behavioral engagement, emotional engagement, and cognitive engagement. Behavior engagement refers to

the student's participation in academic activities, as well as their compliance with school rules and norms. Indicators of behavioral engagement include assignment completion, task involvement, and participation in class activities (Wang, 2017). Emotional engagement refers to students' affective reactions in the classroom, such as their interest, boredom, happiness, sadness, and anxiety. Emotionally engaged learners find learning activities to be fun and joyful (Chiu, 2021). Lastly, cognitive engagement refers to the student's investment in learning, including their use of learning strategies, their depth of thinking, and their persistence in the face of challenges. Students who are cognitively engaged not only perform class activities but also interact thoughtfully with the learning content (Chiu, 2021). The dimensions of engagement correspond to how learners behave, feel, and think (Fredricks et al., 2004; Reeve, 2011). Engagement can be viewed as a meta-construct as its three components are interdependent but qualitatively different and can be operationalized distinctly (Chiu, 2021).

Researchers have treated engagement as an important predictor of achievement and performance in distance learning (Bergdah et al., 2020; Pursel et al., 2016; Wang, 2017; Zhao et al., 2021). Engaged learners find learning fun and meaningful, and they put in persistent effort into their learning (Chiu, 2021). According to Martin and Bolliger (2018), learner engagement improves student performance in online courses by increasing satisfaction and motivation in the learning process. Additionally, Britt et al.(2015) assert that engagement is evidence of learners' considerable effort and that it contributes to the creation of students' own knowledge, leading to effective learning. Kahu et al. (2013) explored the engagement patterns of students in a fully online course. The researchers found that students who reported higher levels of engagement were more likely to participate in online discussions, complete assignments on time, and interact with their peers and instructors. In online learning during the COVID-19 pandemic, learner engagement has also had a crucial positive impact on learning performance and learning task completion, thereby affecting the quality of learning (Zhao et al., 2021).

Moreover, a multitude of variables, such as socio-psychological and instructional design factors, have impacts on engagement. For example, research suggests that the growth mindset (Aditomo, 2015; Zhao et al., 2021), self-regulation (Sun & Rueda, 2012; Meyer, 2014), self-efficacy (Pellas, 2014), and goal orientation (Cho & Cho, 2014) of learners can influence their engagement. In addition, learner engagement can be influenced by instructional factors such as teacher and peer support (Meyer, 2014; Lietaert et al, 2015), the instructor's course preparation (Ma et al., 2015), and class interactions (Cho & Cho, 2014; Ragusa & Crampton, 2018; Robinson & Hullinger, 2008).

In light of the fact that a lack of student participation and engagement during the COVID-19 pandemic has been a major challenge for teachers in distance learning (An et al., 2021; Kye et al., 2020; Lee et al., 2021; Zhao et al., 2021), we must discuss engagement and its relationships with various dynamic factors under these unique circumstances.

Research Questions

This study aimed to qualitatively explore middle school students' engagement in distance instruction during the COVID-19 pandemic. In an attempt to answer the following research questions, the study also examined various contextual factors or conditions surrounding learners that affected their engagement during the pandemic:

1) How do middle school students engage in distance instruction during the COVID-19 pandemic?

2) What engagement patterns have middle school students exhibited in distance instruction during the COVID-19 pandemic?

Methods

Research Design

This study employed a qualitative research method based on grounded theory (Strauss & Corbin, 1998). Grounded theory is a methodology that can be used to develop new understandings of social processes about which little is known or to go beyond preconceived conceptual frameworks (Stern et al., 1982). Grounded theory is concerned with how individuals perceive specific events under specific circumstances or conditions, how they interact with one another, and the consequences of such perceptions and interactions (Hutchinson, 1986; Strauss & Corbin, 1998).

We utilized grounded theory framework in this study for several reasons. First, using an inductive method based on empirical field data was appropriate because the research was conducted during an unprecedented pandemic involving distance instruction on a large scale. In addition, the grounded theory approach allowed for understanding students' diverse experiences with distance instruction. It may be more helpful to understand distance instruction as a composite of various contextual factors rather than just as a simple causality or consequence. Therefore, our grounded theory approach sought to capture students' learning experiences by incorporating contextual factors related to the COVID-19 pandemic.

Participants

The participants were 119 students from a girls' middle school in Seoul, South Korea, taking an online English grammar class. They were all 14-15-year-old eighth graders.

Regarding technological readiness at the beginning of the course, all learners were supported with devices and data usage fee waivers for distance learning. However,

there was inadequate preparation for temporary Wi-Fi issues at home, preparation at the school level, and preparation for server problems.

Regarding previous distance learning experience, 55 students (46.2%) had taken private online lectures in subjects such as Korean, mathematics, and English, while 64 learners (53.8%) had no prior experience with distance learning. South Korea is a nation where additional private education is an active practice outside of school. Therefore, students who had previously experienced distance learning did so for enrichment purposes.

Research Context

The class was an introductory course on English grammar. It was held asynchronously, and the learning activities consisted of teacher-generated lecture videos (10-20 minutes in length) and assignments, such as short quizzes and writing exercises, made available through Google Classroom.

We conducted the study from April to December 2020. Due to the pandemic, the class began in April and ran entirely online through the end of May. From the end of May to December, in accordance with the progression of the pandemic and government guidelines, the majority of the classes were held online, with only seven face-to-face classes (out of 34 total classes). It was anticipated that the implementation of intermittent face-to-face classes would have no significant effect on the results because they were inconsistent and temporary. Any contact or conversation between students was prohibited in face-to-face classes, and temperature and health status checks were conducted concurrently. Therefore, the majority of classes were designed and conducted online(see Figure 1).

As part of the student activities, they are given individual assignments. Students finished quizzes or wrote a short paragraph referring to videos and readings from the textbook. They asked questions via comments or e-mail if something was unclear. The instructor provided both cognitive and emotional feedback on task performance(see Figure 2 & 3).
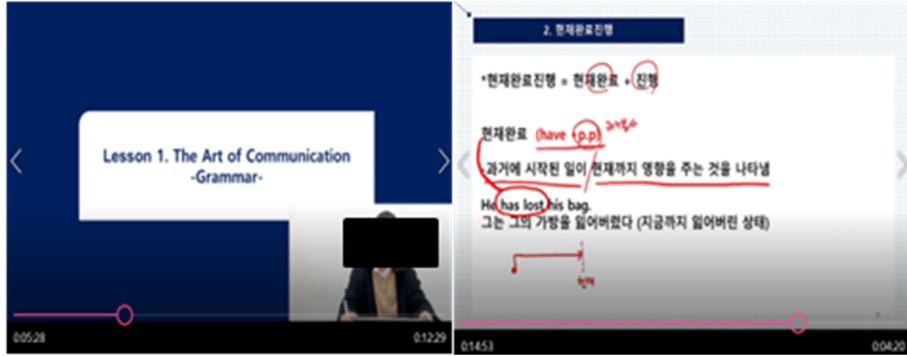
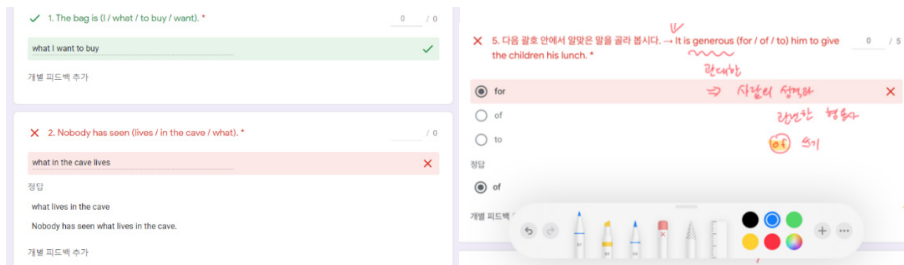*Figure 1*. Sample screens of teacher-generated videos

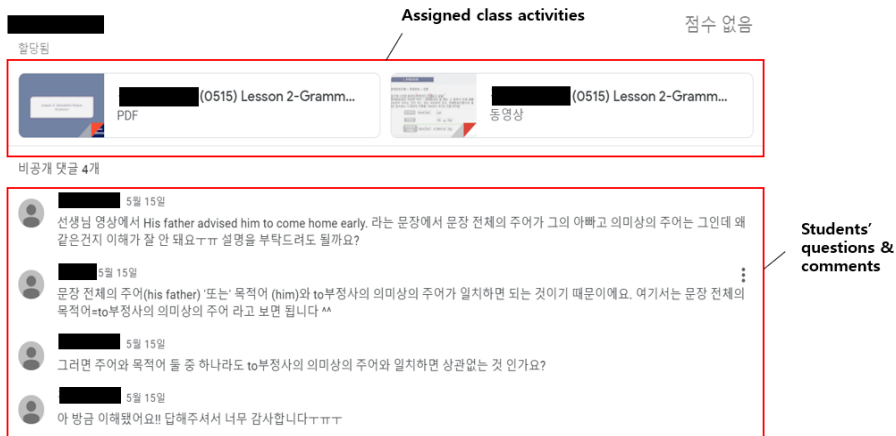*Figure 2*. Examples of short quizzes and teacher feedback

Figure 3. A Sample screenshot of Google Classroom

Data Collection

We collected students' reflective journals using Google Forms, including structured items about their learning engagement at three different timepoints-April, July, and December.

The reflective journals enabled learners to reconstruct their learning experiences and critically reflect on their learning process (Kok & Chabeli, 2002; Spalding & Wilson, 2002). Because learners may not have fully utilized the journal as an opportunity to reflect on their learning experiences without specific guidelines (Quintana et al., 2004), the instructor also guided the structured items to be included in the reflective journals. We generated the items(Table 1) based on the Engagement Scale developed by Fredricks et al.(2004; 2005), which measures behavioral, emotional, and cognitive components of engagement. During the early stage of the research (April), students were required to reflect on their behavioral, cognitive, and emotional engagement with distance learning. During the later stages (July and December), we provided qualitative questions about how their engagement had evolved. The collected data spanned 94 pages (Microsoft Word, size A4) and 2,440 lines.

Table 1

Examples of structured items for reflective journals

- Do you think you are actively participating in the activities of this online class? Why?
- What difficulties did you face while participating in this online class? How did you attempt to solve the issue?
- What emotions did you feel while taking this online class (expectation, joy, interest, anxiety, worry, irritation, etc.)? Where in the class did you feel that way?
- What was your most memorable learning experience?
- What were the advantages and disadvantages of this online class (compared to the face-to-face class or your previous online learning)?

Data Analysis

We examined students' experiences as reflected in their journals and organized them using the constant comparative method of grounded theory. The constant comparative method is an iterative process of alternating between data coding and analysis. To this end, three stages of coding were conducted: open coding, axial coding, and selective coding (Strauss & Corbin, 1998).

First, open coding is the process of conceptualizing the original data by concepts and themes by segmenting and comparing it. In this study, we generated common themes by reading students' materials and data several times and highlighting meaningful statements. In total, 10 themes and 18 concepts were identified. We utilized peer debriefing to ensure the trustworthiness of the analysis. The two researchers created the initial code by reviewing the initial 10% of the data together, and we calculated Cohen's kappa to verify inter-coder agreement. The calculated value of .683 indicated "substantial agreement." In the event of discrepancies, we revised the code by reviewing the data together again, and each researcher divided and analyzed the remaining data. We modified the code after discussion when a unique idea or concept appeared. Data analysis proceeded until there was no more code to integrate or add, and all researchers agreed with the conclusion.

Next, axial coding is a process of correlating themes derived through open coding. Through axial coding process, causal conditions, central phenomena, contextual conditions, intervening conditions, action/interaction strategies, and consequences were derived, and their relationships were visualized in a paradigm model.

Finally, selective coding is the process of discovering or creating a core category by integrating the themes. In this study, a story line was developed based on the core category, 'overcoming the hurdles of transition', and the students engaging in online learning were classified into five patterns according to the properties and dimensions of the themes.

Findings

Conceptualization of Middle School Students' Engagement in Distance Instruction

Through open coding and axial coding process, 10 themes and 18 concepts were derived (see Table 2). The derived themes and concepts were integrated and visualized around causal conditions, contextual conditions, central phenomena, intervening conditions, action/interaction strategies, and consequence. The relationship between them is visualized and presented as shown in Figure 4 .

Table 2

Categories of middle school students' engagement in distance instruction

Theme	Concept
Sudden transition to online learning	New way of teaching
	Self-learning at an independent location (learning at home)
Technology readiness	Household technology infrastructure (digital device and network)
	Schools/online education system technology infrastructure
School education	Attitude toward school education
	Exam and attendance system not specialized for online learning
High level of behavioral engagement	Feeling obligated to finish class activities
Low level of emotional engagement (high anxiety)	Performance anxiety
	Lack of social comparison information
Recognizing the potential of online learning	Experiencing 1:1 interaction with teacher
	Experiencing high accessibility to class materials
	Experiencing the ease of managing learning process
Situational awareness about COVID-19 and online learning	Recognizing that this way of teaching will continue
Development and use of self-regulated learning strategies	Managing learning process
	Developing effective learning strategies
Practices in online learning	Adaptation to the online learning
Perception towards online learning	Recognizing the importance of self-directed learning/self-regulated learning
	Attitude toward learning

Causal condition	Central phenomenon	Action/ Interaction strategy	Consequence
Sudden transition to online learning	1. level of behavioral engagement 2. Low level of emotional engagement (high anxiety)	Development and use of self-regulated learning strategies	Changes in 1. Practices in online learning 2. Perception towards online learning

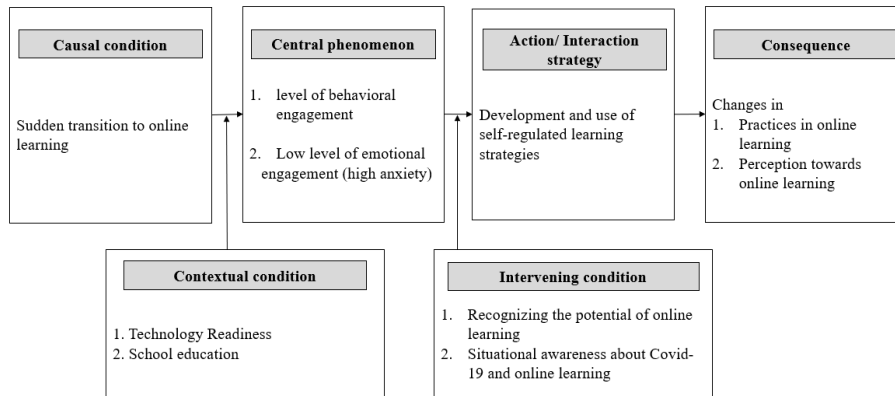| Contextual condition	Intervening condition
1. Technology Readiness 2. School education	1. Recognizing the potential of online learning 2. Situational awareness about Covid-19 and online learning

Figure 4. A paradigm model of middle school students' engagement in distance instruction

Causal condition - Sudden transition to online learning. A causal condition refers to the cause of a phenomenon (Strauss & Corbin, 1998). In this study, a sudden transition in the education system caused by COVID-19 was identified as a causal condition. The students responded in opposite ways to the new way of teaching: "I have never experienced online classes, and I was worried that it would be different from face-to-face classes" or "It's a new way of learning, so I was amazed and excited." In addition, there were some students who had negative feelings about self-learning at an independent location, "I was a little lonely while trying to study alone," while others feel comfortable, such as, "It was somewhat comfortable to study alone at home." As such, students responded ambivalently to the phenomenon.

Contextual condition - Technology readiness, School education. A contextual condition refers to the specific condition that creates a situation or problem affecting the central phenomena (Strauss & Corbin, 1998). In this study, 'technology readiness' and 'school education context' were derived as specific contexts. These are specific factors influencing the central phenomena, 'high level of behavioral engagement' and 'low level of emotional engagement (high anxiety).'

First of all, students experienced several technological problems of their

household, schools/teachers, or online education system, especially at the beginning of the semester. Before the outbreak of coronavirus, there were many attempts to invest in technology infrastructure in public schools in Korea, but not for each household. Therefore, technology readiness can vary greatly depending on the situation of individual households. In addition to problems at home, server problems of the school or online education systems have also emerged.

"I was annoyed when I couldn't start the classes for various reasons including not having internet connection at home."

"I had to buy a new laptop because the old one was not good enough."

"Sometimes materials needed for a class could not be downloaded due to a server error."

In addition, the student's attitude toward school education was also found to be a specific condition that influenced the student's engagement. Students who thought that they had to participate hard in school participated in online classes as well. They took things for granted, such as following the school rules and adhering to classroom norms: "I did my best because I thought that online classes were originally classes I should have at school," "They were online assignments, but they were also provided by teachers. Like face-to-face classes, online classes were taught by school teachers, so I thought they were all important, so I was trying to study and check every video and quiz posted by the teacher."

In addition to the students' faithful attitude toward school, the school policies also influenced students' engagement. As policies related to online class attendance, written exams, and performance tests were not quickly established, the guidance for them were not sufficiently provided and the agreement among school members could not arrived.

"I know I have to take the exam anyway... so I am going to actively participate in the class because what I learn in the online class will be on the

exam."

"I don't know how to take the exam. Is it possible to take the exam? I need to prepare for the written exams and performance tests anyway."

Central phenomenon - High level of behavioral engagement, Low level of emotional engagement. A central phenomenon is a central thought or event occurring within a group, and a phenomenon controlled by action/interaction strategies (Strauss & Corbin, 1998). In this study, 'high level of behavioral engagement' and 'low level of emotional engagement(high anxiety)' were identified as the central phenomena of middle school students' online learning experiences. Students felt obligated to finish class activities such as watching videos or submitting assignments, showing high level of behavioral engagement.

"I think being actively involved in online learning means doing all of the class tasks given to me on time, just like in a school class. I think I did well because I watched the lecture videos and submitted assignments in time."

However, students experienced relatively negative emotions about their learning, contrary to the behavioral indicators. Some students showed anxiety about their performance: "I was constantly worried whether I was doing alright," "As I was taking classes by myself, it was not easy to concentrate, so I felt anxious that my grades would be bad." Other students wanted to compare their progress with other students. They mentioned "Am I the only one struggling?" or "Is it just me taking long to solve the quiz?" In this way, students have questioned whether they are doing well in this unfamiliar way of learning, and the fact that it was difficult to communicate with peers further exacerbated this situation. These phenomena, which most students experienced, are the key issues in the online learning experience of middle school students.

Intervening condition - Recognizing the potential of online learning, Situational awareness about COVID-19 and online learning. An intervening condition plays a role in facilitating action/interaction strategies in a given situation (Strauss & Corbin, 1998). In this study, 'recognizing the potential of online classes' and 'situational awareness about COVID-19 and online learning' were derived as intervening conditions. As online classes continued, students started to recognize the possibility of online class by experiencing increased 1:1 interaction with teachers, high accessibility to class materials, and ease of managing learning process.

> "In face-to-face classes, other friends in the class made it a little uncomfortable to ask questions during class. In online classes, I liked that it was easier to ask teachers questions through emails or comments."

> "I can review whenever I want after class, and I can re-check and organize the materials teachers provide. I don't have to worry about losing class handouts."

> "I can listen to the lecture at my own pace. I liked that I could slow down the difficult parts of the lecture."

In addition, they recognized online learning not as a temporary event but a method of learning of the future.

> "I don't think the pandemic is going to end soon. I think I will continue to have online classes even when I go to high school."

> "Online classes will continue and probably will be normalized."

The degree of the awareness serves as an intermediary to strengthen or mitigate the influence of contextual conditions on the central phenomena, and promotes subsequent action/interaction strategies.

Action/interaction strategy - Development and use of self-regulated learning strategies

An Interaction/interaction strategy refers to the strategy designed to cope with phenomena under a specific situation (Strauss & Corbin, 1998). Students were found to develop and utilize self-regulated learning strategies in online learning environment under intervening conditions. They started to managed their own learning: "I made a time schedule for class activities," "I washed my face if I was sleepy, and if it was too difficult, I took a break and watched the lecture again."

In addition, they stared to develop effective online learning strategies.

"At first, I focused only on answering the quiz, but now, I kept thinking about how to internalize what I learn."

"I could allocate the time for class activities as I want… I was able to slow down the difficult part… I thought carefully and did assignments because I had enough time."

"Even if it was a little difficult and confusing, I tried to finish the assignment by myself by referring to the class materials… If I did not understand the online class, I researched on my own from that moment by searching for information on the Internet, and studied until I could understand."

Many students mentioned the difficulty in asking questions regarding limitations in immediate questions/answers and inability to put their thoughts into written words. However, it could be an opportunity for students to search for materials on their own and clarify their questions before asking the teacher.

"…I was worried that the teacher didn't understand what I am talking about."

"When I had a question, I first replayed the part of the video I didn't understand, or found the grammar notes I wrote before. If I still didn't

understand, I asked the teacher."

Consequence – Changes in practices and perception in online learning. The importance of self-regulated learning was recognized while students experienced interventional conditions and developed action/interaction strategies. The perception of learning and school also changed.

"At first, I couldn't participate well because I wasn't used to it, but now I'm used to it and my participation has gone up… Not only did I gained a wide range of knowledge, but also experienced classes befitting present era as I learned a new way of teaching and learning."

"I experienced the advanced civilization of the 4th industrial revolution, and learned that there are many ways of learning even if I don't go to school."

"As I continue to take classes, both ways seem to have clear pros and cons. Face-to-face classes aren't always better than online classes. And I also liked that I could study or do other productive activities in my spare time. I hope to participate online classes even if pandemic is over in the future."

Some students still have a hard time adapting online learning. There were some students who are positively aware of online learning, but could not actively develop learning strategies.

"I know it's good, but like I said before, I'm not a self-directed student."

Clustered patterns of middle school students engaging in distance learning during the COVID-19 pandemic

By reviewing the themes and processes derived through open coding and axial coding, core category, 'overcoming the hurdles of transition' was deduced. The core category refers to an abstract concept associated with all categories and attributes

found in open coding and axial coding. 'Overcoming the hurdles of transition' is a holistic concept that encapsulate the process of students engaging in emergency remote teaching. Based on the concept, a story line developed.

Students' experience with online learning began from a confusing situation due to a sudden transition in the education system caused by COVID-19. Since this was the first large-scale online learning in Korean public education, learners experienced ambivalent feelings of excitement and anxiety about this new teaching method. Due to the sudden shift, schools could not sufficiently prepare guidelines for online attendance and exams. Students also experienced problems with digital devices, internet connection, and LMS servers, especially early on in the semester. At the same time, learners recognized that online learning is another form of school education. Within this context, students showed a relatively high degree of behavioral engagement in attendance, assignment submission, and watching class videos. They also showed anxiety and concerns towards their performance and learning process. However, with the prolonged pandemic situation, they came to think that online learning may not be a temporary event, but a continued method of learning. In addition, as online learning continued, they began to realize that they had more opportunities to ask questions to the teacher, could retrieve the class materials freely, and manage their own learning progress. Based on this perception, students began to develop and utilize self-regulated learning strategies based on the characteristics of online classes, and even if they could not actively develop learning strategies yet, they came to realize the characteristics and possibilities of online learning. However, some students still had a hard time accepting online learning. Although there was a difference in degree and speed in adaptation, all these students had been experiencing the process of 'overcoming the hurdles of transition'.

Participants were classified into five patterns based on the theoretical relationship between properties and dimensions of themes regarding the experience of 'overcoming the hurdles of transition'. Learners showed different patterns depending

on whether the level of perception of learners for each category was positive or negative, receptive or resistant, or strong or weak.

Table 3

Patterns of middle school students engaging in distance instruction

Theme	Proactive	Conservative	Receptive	Reactive	Passive
Sudden transition to online learning	Receptive	Resistant/ Indifferent	Receptive	Resistant	Resistant/ Indifferent
Technology Readiness	High/ Medium	Low/ Medium	High/ Medium	Low/ Medium	Low/ Medium
School education	Receptive	Resistant	Resistant/ Medium	Receptive	Receptive
High level of behavioral engagement	Strong	Weak	Weak	Strong	Strong
Low level of emotional engagement (high anxiety)	Weak	Strong	Weak	Strong	Strong
Recognizing the potential of online learning	Strong	Weak	Strong	Weak	Weak
Situational awareness about COVID-19 and online learning	Strong	Weak	Weak	Strong	Weak
Development and use of self-regulated learning strategies	Active	Passive	Passive	Active	Passive
Practices in online learning	Active	Passive	Passive	Active	Passive

Proactive Learners (HB-HC-HE)*. Groups exhibiting high levels of behavioral, cognitive, and emotional engagement are more proactive learners. They are effective goal-setters and goal-achievers in their distance learning. These learners approach distance learning with an inquisitive mindset and find it intriguing. These learners actively engage in distance learning, recognizing the strengths and potential of online classes and perceiving distance learning as an enduring learning method rather than a temporary event. Thus, they contribute positively to online classes by developing

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* H(High), L(Low), B(Behavioral), C(Cognitive), E(Emotional)

and utilizing their own learning strategies.

Conservative Learners (LB-LC-LE). Low levels of behavioral, cognitive, and emotional engagement characterize conservative learners. They are learners who participate as passively as possible and are unaware or less aware of the future potential of distance learning. They wish for online classes to end soon so they can return to in-person classes. Therefore, these learners continue to take a passive approach to distance learning, putting in the least effort to complete the assigned tasks and rarely developing learning strategies.

Receptive learners (HB-LC-HE). Students who are receptive learners have low levels of cognitive engagement but high levels of emotional engagement . Although receptive learners perceive distance learning positively, they struggle to develop and implement their own learning strategies. These learners find distance learning interesting and recognize its potential. They are aware of how crucial it is to create an appropriate environment and employ effective learning strategies for distance learning. However, they are unable to put this awareness into practice.

Reactive Learners (HB-HC-LE). Reactive learners are students who show low emotional engagement but high cognitive engagement. Reactive learners are those who diligently attend class, turn in every assignment, and employ their own learning strategies effectively but who, despite these efforts, exhibit high levels of anxiety or have unfavorable attitudes toward online classes. These learners believe that face-to-face learning is significantly more effective than distance learning. They do, however, act in response to external circumstances, feeling obligated to attend their online classes and take exams in light of the likelihood that distance learning will continue. Consequently, these learners diligently participate in their classes because they believe they have no other option.

Passive Learners (HB-LC-LE). Passive learners are characterized by high only behavioral participation but low cognitive and emotional participation. While their learning patterns are similar to those of conservative learners, they are characterized by their commitment and dedication to school education. On the surface, it appears that they are attentive to class videos and turn in assignments regularly, but in reality, they are merely following the rules because they are in a school class, and there is no effective learning.

Discussion and Implications

This study aimed to explore how middle school students experienced distance learning during the COVID-19 pandemic using a grounded theory approach. Since COVID-19, distance instruction has become a 'new normal' way of teaching and learning. Based on the results of this study, it is expected that new possibilities of distance instruction will be explored and implications for effective online classes will be provided. The participants in the study were 119 middle school students, and data collection and analysis were conducted simultaneously. The discussion and implications related to the research results are as follows.

The study identified the central phenomenon experienced by students in the COVID-19 situation as "Overcoming the hurdles of transition." This implies that students were, to varying degrees and at different paces, in the process of overcoming the difficulties associated with the unprecedented shift to large-scale distance instruction. These difficulties stemmed not only from personal challenges but also environmental and social factors, highlighting the need for a holistic approach that considers individual, environmental, and social aspects.

Next, after overcoming the hurdles, what happens? Online learning is no longer seen as an inevitable choice of face-to-face classes(Dhawan, 2020). Instead, the focus should be on developing well-designed online learning experiences that maximize the

advantages of online classes. In Korea, new educational innovation models that combine online and face-to-face classes are being attempted. This is possible because all stakeholders, including students, teachers, and schools, have gained experience with distance instruction during the COVID-19 era, while they were "overcoming the hurdles."

Based on the paradigm model presented as a result of this study, we will discuss suggestions for each theme that affects student engagement. Table 4 summarizes the suggestions according to each theme of the paradigm model.

Table 4

Suggestions of each theme in paradigm model

Theme	Suggestions / Instructions strategies
Technology Readiness	▫ Ensuring School-level preparations (technology and teacher training) ▫ Addressing LMS-related server issues ▫ Hiring a technical support team at each school ▫ Providing sufficient guidance on the LMS
School education	▫ Creating an atmosphere where public education can be trusted ▫ Facilitating positive attitude toward schools and teachers based on intimacy with students-students and students-teachers.
High level of behavioral engagement	▫ In class, creating a positive, encouraging class atmosphere.
Low level of emotional engagement (high anxiety)	▫ Facilitating learners to recognize the positive potential of distance instruction: making learners to experience increased one-on-one interactions with their instructors, easy access to instructional materials, and streamlined management of their learning process. ▫ Providing multiple interaction channels with instructors and peers through e-mails, messages, and comments, or real-time classes
Recognizing the potential of online learning	▫ Organizing learning materials in a way that allows learners to easily retrieve them afterwards. - Assign clear titles to recorded lectures to make the learning concept and topic clear - Provide supplemental paper materials for video content - Provide cloud storage for students to save their own or other learners' completed tasks or artifacts for future use
Situational awareness about COVID-19 and online learning	▫ Discussing this new normal learning method with students - Introduce and apply online class-based education models (flipped learning, blended learning, etc) - Discuss with students how distance instruction can develop in the future.
Development and use of self-regulated learning strategies	▫ Facilitating learners to develop self-regulated learning strategies - Integrate self-regulated learning strategies into a system (LMS, etc.) Checklists or dashboards can be provided to facilitate student recognition of achievement. - Dedicate a portion of the class to the explicit practice of self-regulated learning strategies. For example, students can set goals at the beginning of the semester.

* Sudden transition to online learning(condition), Changes in practices/perception(results) are excluded from this table.

Technology Readiness. In South Korea, technology readiness was one of the top priorities for education in COVID-19. In the early stage of COVID-19 outbreak, education experts recognized the importance of establishing a public platform for distance instruction.

In addition to supporting the use of public education platforms developed by Korea Education and Research Information Service (KERIS) and Education Broadcasting System (EBS), private platforms were also encouraged. Digital devices and expenses for data usage during distance learning were also provided(MOE, 2020).

However, despite these efforts, students still faced technology issues that hindered their learning experience. These issues included temporary Wi-Fi problems at home, school-level preparations, and server problems.

These factors can be linked to Herzberg's Motivation-Hygiene Theory, which suggests that dissatisfaction factors must be minimized to ensure learning motivation(Herzberg, 2005). To address technology readiness as a dissatisfier, school-level preparations such as technology and teacher training must be ensured, LMS-related server issues must be addressed. Hiring a technical support team at each school would also be a solution. Learners should also be provided with sufficient guidance on the LMS they are using.

School Education/ High level of behavioral engagement. Students who have a positive view of school and teachers, and who trust public education, tend to show higher levels of behavioral engagement. However, this does not mean that students who simply comply with public education are necessarily engaged learners. As shown in the study results, some students may exhibit patterns of being "reactive" learners with low emotional participation or "passive" learners who focus only on completing tasks.

Thus, it is essential to foster a positive attitude towards schools and teachers and to create an atmosphere where public education is trusted. Building "school engagement" based on intimacy between students and teachers is critical. Teachers

should prioritize creating a positive and supportive class atmosphere, which can have a significant impact on student engagement.

Low level of emotional engagement (high anxiety)/ Recognizing the potential of online learning. The findings of this study suggest that students' emotional engagement appears to be the most sensitive. Specifically, students' anxiety was related to their performance, with concerns about falling behind and not doing well on tests leading to high levels of anxiety. To support emotional engagement, instructors should design lessons that consider cognitive strategy use, instructional organization, and interaction with students.

Furthermore, online classes should be structured to encourage students to recognize the benefits of distance instruction. According to Davis (1989), innovation in education starts with perceived usefulness. Therefore, instructional design should capitalize on the unique features of distance instruction to enhance student engagement. The participants in this study began to recognize the potential of distance instruction through increased one-on-one interactions with instructors, easy access to instructional materials, and streamlined learning management.

To facilitate this recognition, multiple interaction channels with instructors and peers should be provided, such as email, messaging, and comments(Martin & Bolliger, 2018). Additionally, real-time classes and distance learning can be blended for effective communication(Dhawan, 2020). Second, learning materials should be organized in a way that allows for easy retrieval, such as clear titles for recorded lectures, supplemental paper materials for video content. In addition, students can save their own or other learners' completed tasks or artifacts in the cloud for future use (Barrett & Garrett, 2009).

Situational awareness about COVID-19 and online learning. Student engagement was also found to be related to awareness of COVID-19. Specifically, students who understood that this learning method was not temporary and would

continue even after they entered high school or university were more motivated to develop effective learning strategies. To facilitate this, it is important for instructors to allocate time to explicitly discuss this new normal learning method with students. Instructors can introduce and apply online class-based education models, such as flipped learning and blended learning, and discuss with students how distance instruction can continue to evolve in the future.

Development and use of self-regulated learning strategies. Self-regulated learning has been emphasized in numerous studies, including a study by Miao and Ma (2022), who reported a positive correlation between self-regulation learning and students' learning engagement in online environments. Additionally, Doo et al. (2021) found that self-regulation affects learning engagement both directly and indirectly. Therefore, it is important for students to develop self-regulated learning strategies.

Pintrich's(2004) stages of self-regulated learning provide a framework for suggesting strategies. First, in the planning stage, students can be encouraged to set goals, plan their time and effort, be aware of tasks and environments, and activate prior knowledge. Next, in the monitoring stage, students can monitor their motivation, emotions, and metacognition, as well as be aware of the use of effort and time and seek help when needed. Finally, in the control stage, students can choose appropriate cognitive strategies, select motivation and emotion management strategies, and increase their efforts.

How can these self-regulated learning strategies be facilitated in the classroom? They can be integrated into a system such as an LMS, and checklists or dashboards can be provided to facilitate student recognition of achievement. A portion of class time can be dedicated to the explicit practice of self-regulated learning strategies. For example, students can set goals at the beginning of the semester, teachers can provide feedback related to student performance, and students can have the opportunity to monitor their cognition, emotions, and motivation.

Finally, it is important to provide the above suggestions carefully and specifically

for each type of learner engagement presented in the research findings. The results of this study demonstrated that each learner approaches distance learning differently, and therefore, it is necessary to understand that learners can have a variety of educational experiences and apply tailored instructional strategies accordingly during the pandemic.

For instance, teachers can provide more emotional support and encouragement, and demonstrate the benefits of online classes, especially for Type 4 (reactive) learners who can effectively apply learning strategies but have negative perceptions of distance learning. Such cognitive and emotional support and scaffolding should be provided more meticulously and consistently for Type 2 (conservative) learners, and instructors should identify and address other environmental problems that may hinder students' engagement.

Limitations and future research

This study has several limitations. First, the study was qualitative in nature as it was a preliminary investigation of a novel social phenomenon, COVID-19. Thus, future studies should quantitatively analyze the constructs identified in this study. Additionally, cluster analyses of learner engagement patterns and studies analyzing the relationships between factors influencing learners' engagement in distance learning should be conducted. Second, this research studied the process of distance learning for a specific group during the COVID-19 pandemic. Distance learning experiences likely vary depending on the learners' individual demographic characteristics, such as gender or age, as well as the schools' location (e.g., urban or rural). Therefore, there is a need for additional research on learners from more diverse backgrounds and school contexts. Finally, because the data was based primarily on learners' reflections, we analyzed students' reports of their own learning processes or strategies rather than specific instructional design improvements or needs. Thus, future studies may interview instructors or students to address this issue.

Despite these limitations, this study advances our understanding of middle school students' engagement in distance learning during the COVID-19 pandemic, exploring contextual factors surrounding learners and suggesting practical implications for future distance learning.

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