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Posthuman Learning Culture and Internet-Based Private Tutoring in South Korea: Implications for Online Instruction in Public Schooling

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Abstract: In the digital age, education through the Internet becomes a new form of teaching and learning, which leaves many challenges as well as possibilities for teachers and students. In this study, we analyzed the effective practices for online learning comparing schools and private supplementary tutoring. South Korea is an appropriate country for this investigation, as public and private education sectors have attempted to advance online teaching and learning and approximately 80% of Korean elementary and secondary school students take online courses provided by private tutoring institutes. This qualitative study reveals that online learning in private supplementary tutoring, commonly known as shadow education, is highly advanced and favored by students and parents compared to that of schools. The features of online learning in shadow education include individualized learning, effective communication skills under post-human space, attention skills for cyber learning, and advanced Internet technologies and tools. The study results have practical implications for educational administrators and schoolteachers concerning effective online teaching and learning. In addition, we suggest that a more comprehensive understanding of online learning is needed to guide schoolteachers and policymakers.

Keywords: online learning; Korean education; Internet-based private tutoring; shadow education; educational technologies; education for social responsibility

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1. Introduction

How to make online learning effective and meaningful has become a major research topic of educational studies around the world [1,2]. With the highly advanced internet technologies, South Korea is leading the way, practicing effective online education methods for more than the past two decades [3–5]. Unlike face-to-face classes in traditional school classrooms, many students in Korea today are studying in online classes provided by shadow education institutes which are called "Internet hakwons" [6]. South Korea is one of the countries with a leading education system and its students widely use online learning in shadow education (SE) [6–9]; therefore, understanding the students' online learning in SE in this context will provide us with practical implications for effective online teaching and learning.

The digital age triggered by the fourth industrial revolution affects almost all areas of human life, changing how humans experience their environment and interact [10]. Education and learning are also involved in these changes in that the forms and practices of education and learning actively accept the attributes of the digital age [11]. Policymakers, practitioners, and researchers have been putting enormous efforts into finding effective ways for students to learn in the new era. In other words, curriculum researchers and educational technology researchers have experimented with distance education and other

forms of instruction for decades to determine their strengths and weaknesses and seek a more efficient method.

Subsequently, the COVID-19 pandemic hastened the practical implementation of these new forms of education and learning [12]. In many schools and universities worldwide, online learning has become common. This unexpected situation posed a major challenge for many education administrators, researchers, and practitioners. Education authorities and schools have had to build and put into practice a new system in a very short time without sufficient capacity to prepare teachers [13]. However, SE providers in South Korea were ready for that change because the industry had moved toward online learning before the COVID-19 pandemic. Online learning provided by SE has been chosen by many Korean students and parents [9], and the pandemic strengthened the trend [14].

SE in Korea has become an even more important learning platform, providing students with online learning and using cutting-edge technology and devices, interactive online systems, and teacher training systems [9,15]. Online learning in SE has been used by many students for supplementary learning, individualized learning, and accelerated learning in Asian countries and, more recently, in Western countries [16]. In this respect, this study investigates how Korean students learn through online learning in SE outside of school. We examine the features and benefits of online learning in SE in light of effective online teaching and learning. Specifically, we use qualitative research methods to explore, from the perspective of students and parents, the progress and effectiveness of online learning in SE compared to classroom learning, and how it contributes to student learning outcome. In the following, we first provide an overview of online learning in SE in Korea, followed by research methods. Then, we provide the key features of online teaching and learning of SE in South Korea that make it effective. We also discuss the implications that are taken from this study.

2. Korean Students' Online Learning in Shadow Education (SE)

In South Korea, online teaching and learning are popular and highly advanced [9,16,17]. Such educational advancement is possible because of the highly developed Internet network. Advanced Internet technology and infrastructure enabled the development of online educational practices. From the 1960s, the Korea Broadcasting System (KBS) had a channel, KBS3, which transmitted educational programs through radios and TVs nationally. In the 1980s, the KBS channel broadcasted TV programs about middle high school subject learning and preparation for Korea's Scholarly Ability Test (KSAT) [18]. Korean public education has actively incorporated education through information and communication technology (ICT) and the Internet for the past three decades. Beginning computer education in schools in 1990, the Korean ministry of education (MOE) continuously launched new policies and curriculum revisions for ICT education and education through ICT. In 2004, MOE created a comprehensive e-learning development plan; in 2007, digital textbook development began; in 2012, a cloud-based education service was introduced; in 2012, software education was included in the curriculum for elementary and secondary students. In the last five years, programming education has been included in the national curriculum; an e-learning center has been established [19]. Since 2022, the MOE has provided a personal tablet PC to all elementary and secondary students in the country. EBSi, a channel provided by the Education Broadcasting System (EBS) of the Korean MOE, has also innovated its services, including the launch of a smartphone mobile app in 2013, a Smart Book service in 2017, a software education platform, e-soop, in 2019, an artificial intelligence (AI)-based learning service, Danchoo, in 2019, and an EBSi online class in 2020.

The historic moment in the development of online learning in Korea was in 2004 when the EBS launched EBSi, which provides lectures on high school subjects and KSAT through the Internet. The purpose of EBSi was to alleviate the overheated enthusiasm for private tutoring among Korean parents and students [8,20,21]. EBSi contributed enormously to expanding the possibility and importance of online learning for Korean teachers, students,

and parents. While online learning through the Internet was promoted initially in the public education sector, it was the private sector, SE, that advanced the system.

The application of these new technologies to the private sector is generally called "private tutoring through the Internet" [16], "online tutoring" [22], and "private online tutoring" [23]. Such private tutoring is called *ingang* in the Korean language, which is an abbreviation for "Internet gang-ui", which means "lecture through the Internet" [7,8]. Private supplementary tutoring through the Internet is called "Internet-based private tutoring" (IPT) [7]. IPT emerged in Korea at the beginning of the 2000s. At that time, the primary targeted students were high school students who needed to prepare for KSAT. Thanks to the highly developed Internet network and the universalization of smart devices in South Korea, Korean students started taking Internet-based tutoring online lectures at home, in cafes, on buses, and on the subway, using the available Internet networks free of charge [8].

Traditionally, SE was mainly provided by small hakwons (hakwon is a private tutoring center or institute in Korea) [7]. For the past two decades, tutoring companies have aggressively developed Internet hakwons, attracting many students. Thus, many instructors who gave lectures under EBSi moved to Internet hakwons [9]. As students and parents knew about the well-trained and experienced instructors, they scrambled to Internet hakwons. Thus, big hakwons in major cities were able to expand their market throughout the country, offering good quality online learning opportunities for all students, including those in rural areas. As the market became national and many students could take the courses, the tuition of Internet hakwons went down, which allowed students who were not from wealthy families to have access to these learning opportunities [9].

The popularity of IPT among Korean students might be surprising to some. The size of the Korean IPT market for elementary and secondary students is estimated at 700 million dollars annually [24], which was 20 million dollars in 2005 and 300 million dollars in 2016. Approximately 80% of Korean elementary and secondary students participate in IPT during their K-12 years to learn a foreign language, supplement their schooling, and prepare for the College Scholastic Ability Test [8,24].

Large, franchised companies mainly provide online learning in SE. There are many Internet-based private tutoring institutes, or Internet hakwons, in South Korea, such as Megastudy (with 5 million registered students), Etoos (5 million students), Sky Edu (3 million students), Daesung Mimac (4.5 million students), and Mildang PT (200,000 students). As of 2022, there are more than a thousand Internet hakwons in Korea. However, there is no accurate statistical data on the number. Small Internet hakwons usually have about 300 enrolled students, medium Internet hakwons have 500 students, and the large ones have more than 10,000 students. The large franchise Internet hakwons dominate the market. M Internet hakwon, for example, offers approximately 300 courses with more than 7000 instructional videos from 70 hakwon teachers. They offer more than 30 courses with 10 teachers for each core subject, such as English, Korean, math, science, and social studies.

For example, in the case of M hakwon, it is 1.09 million won (USD 900) per year and in the case of E hakwon, 520,000 won (USD 400) per year. An online lecture series focusing on English reading skills to prepare for the College Scholastic Ability Test consists of 28 chapters with a total length of 1400 min and costs 87,000 won (USD 80). However, there are additional fees for additional materials or online lectures for other courses. For example, if one wants to take the advanced course after the basic one, it will cost 2.18 million won (USD 1800) per year for M hakwon and 1.04 million won (USD 800) for E hakwon. MP hakwon was the first hakwon to introduce the concept of personal teaching. In traditional online hakwons, students mostly learn from recorded videos. However, an instructor from MP teaches and guides one student at a time, creating a new paradigm of online hakwon. Costs start at USD 200 per month for one subject and vary widely depending on the teacher's academic background and teaching skills.

Some ingang teachers attain idol-like status among teenagers, the so-called "star tutors". Teens view their tutors as movie stars or famous musicians [25]. A star tutor

in Korea has hundreds of thousands of students. These tutors have their management team do all the tasks, such as writing textbooks, recording lectures and real-time lectures, evaluations, and feedback. Most importantly, several young teachers working for the star tutors communicate with students and increase their satisfaction by promptly answering students' questions and helping them learn [8]. In addition, innovations for online shadow learning are continuously being developed in South Korea.

The Internet hakwon has experienced dramatic growth in quality and quantity for the past two decades, becoming one of the key forms of SE in South Korea. It has been argued that Internet-based SE has created a "new paradigm", growing exponentially in many countries worldwide [16]. We could argue that it has already become a new normal for many students worldwide [26]. The effectiveness of online learning SE has been recognized by many students and parents as it has already shown remarkable growth [14]. In this regard, examining how Korean students learn with IPT would provide valuable guidance for educators and policymakers to ensure effective online teaching and learning.

3. Research Methods

To understand the characteristics of online learning in SE, we conducted a comparative case analysis of student learning during online instruction in schools and online learning in SE. To understand the features of online learning in SE for Korean students, we used Internet ethnography [27–29], a qualitative research methodology used to study cultural patterns and communications that emerge as we ask specific questions when people encounter each other through internet technologies in virtual spaces. The methodology was appropriate as we were seeking the distinctive behaviors and responses of teachers, instructors, and students in online learning settings.

The research participants included 20 elementary students, 15 middle school students, 20 high school students, 15 Internet hakwon teachers, 15 school teachers, and 15 parents. Initially, we purposefully selected five schools and five internet hakwons. We personally visited the schools and hakwons to recruit student, teacher, and instructor participants. Then, we used snowball sampling to recruit additional participants. These participants were parents of the students.

To collect data, we used document analysis, in-depth interviews, and participant observation. For document analysis, we gathered data from various curriculum teaching materials from 15 school teachers and 15 hakwon instructors. In addition, we photocopied and analyzed portfolios, notebooks, learning diaries, and online communications on students' smartphones, and laptops gathered from students and their parents. (See Table 1 for overview of data used.)

Table 1. Data used for document analysis.

Types of Data	Examples	Data Source
Curricular materials	Textbooks, program descriptions, evaluation sheets, and teacher guides	Hakwon websites, school websites, schoolteachers and hakwon instructors
Learning materials	Learning diaries, evaluation sheets, exam papers, portfolios, notebooks, smartphone data	Student participants and parents
Teaching materials	Teaching plans, presentation materials, exam data sets	Schoolteachers and hakwon instructors

We then conducted qualitative field research from September 2021 to August 2022, during which we collected data through in-depth interviews and participant observation. Interviews were conducted in different ways (online and offline) and in various places (homes, cafes, school classrooms). We interviewed each participant for 1 to 2 h; each author interviewed one third of the participants. A total of 160 h of interviews were recorded and

transcribed for analysis. All interviews were conducted in a semi-structured format using prepared interview questions to guide the initial stage of the interviews. Next, we followed the interviews with more follow-up questions. The interviews were initially conducted to identify general aspects of online learning. The interview questions were then modified to focus on the specifics of online learning in SE and the learning methods used. Table 2 presents examples of the interview questions.

Table 2. Examples of the interview questions.

Participants	Interview Questions
Students	■ What are the challenges of online learning compared to face-to-face learning? ■ Which is more effective, online teaching by schoolteachers or hakwon instructors? Why? ■ What aspects of online teaching by schoolteachers do you like or dislike and why? ■ What aspects of online teaching by hakwon instructors do you like or dislike and why?
School teachers & Hakwon instructors	■ What are the challenges of online teaching? ■ What do you do to resolve the challenges? ■ What are the main strategies used to deliver the lessons? ■ What technologies do you use in online teaching? ■ What do you think your weaknesses and strengths are regarding online teaching and what do you do to improve your teaching? ■ How does your online teaching differ from your offline teaching? ■ How do you encourage students to focus during online classes? ■ What do you do when students are not focused?
Parents	■ Between the offerings of online learning schools and hakwons, which one do you prefer over the other and why? ■ How do your children learn differently in online classes conducted by schools compared to those of hakwons? ■ How do you help your children achieve effective online learning? ■ What do you want from school teachers and hakwon instructors to facilitate effective online classes for your children?

For participant observation, we observed 60 online classes of teachers and 80 online classes of Internet hakwons. To experience first-hand observation, we observed 22 live online classes of schoolteachers and 32 live online classes of hakwon instructors. We observed other classes by watching those recorded by the participants (per our request). Our observation was guided by various key aspects of online learning that we identified through literature review and document analysis. During the observation, we produced fieldnotes for later analysis. The key aspects included:

- Classroom atmosphere
- Instructional methods used
- Modes of learning of students
- Skills used to deliver content knowledge
- Skills used to capture and maintain students' attention
- Evaluation methods
- Communication between teacher and student, and student and student
- Types of supporting learning materials provided

This specific comparative case analysis is used for data analysis [30]. The exploratory comparative case analysis was chosen for this study because its purpose was to compare online learning in SE and online learning in schools. We also conducted a micro-ethnographic analysis to analyze student learning in online classes via both schools and SE. The micro-ethnographic analysis was particularly useful to analyze various interactions in online classes [31,32].

Given the research question—what are the features and benefits of online learning in SE in light of effective online teaching and learning?—the analysis was conducted to identify the effective strategies used. All data collected were read and reread for analysis to

identify the characteristics of online learning in schools and SE. This preliminary analysis was followed by initial code generation resulting from the interplay of research questions and collected data. Data collection and analysis influenced and shaped each other through interactive cycles in the research process. Analysis continued until data saturation was reached as researchers cross-checked codes and themes. The analysis led to the identification of the four main characteristics of online learning in SE. Table 3 presents the four themes, codes, and representative data.

Table 3. Examples of data analysis.

Themes	Codes	Data
Individualized learning	Personalized curriculum	"There is a much greater advantage to being able to adapt my own learning process rather than keeping up with school progress". (student interview)
	Various selections of instructors and courses	"In the internet hakwon, I can choose from several instructors and lectures. You have a lot more options than at school, so you can study more efficiently". (student interview)
	Choices of learning time and places	Minsu, unlike other students, took out his tablet at 2 am at the coffee shop and started studying. He was going through the process of creating his own routine, choosing a time and place for his approach. (fieldnote)
Effective communication skills	Instructors communicative gestures	"But here, the teacher sends each friend an emoticon or a warning sound, and questions while I am watching lectures so I think I can study with a little tension". (student interview)
	Communication through note-taking	"While taking the class, SiJun takes notes of conceptual content on her tablet. Based on the notes, the instructor asks questions about whether she understands". (student interview)
	Sleepless tutors	"Every day, yes every day, she checked my learning progress and I was able to ask questions whenever I needed". (student interview)
Attention skills	Multisensory teaching and lecture	When explaining historic relics in his class, Mr. S. shows the structure of the relics in CG or provides additional video materials so that students can easily understand them. (fieldnote)
	Unique and attractive ways of speaking	Instructor J did not allow any time to get bored during the lectures with his unique way of speaking and funny jokes. (fieldnote)
	Dynamic screen composition	He also employs filming techniques that can instantly reawaken students' concentration, such as rotating or exploding the screen. (fieldnote)
Advanced Internet technologies and tools	Smart notebook	"If I use Smart Note, all the notes I take while studying are cumulatively saved, and when I send my notes to the teacher, they give me feedback right away. That is why I prefer using a smart notebook". (student interview)
	AI learning program	"But I think the AI Hubruta program allows me to ask questions and answer questions, so that I can check the parts I do not know or whether I have learned correctly". (student interview)
	Increased sense of presence through metaverse	"But in the metaverse study space, other friends are checking to see if my avatar is studying, so I think my friends are actually looking at me. So, I study harder. Also, it gives me a sense of studying together and competitively". (student interview)

We performed a triangulation and member trustworthiness review based on Lincoln and Guba's [33] criteria. Participant and hakwon data were anonymized. We obtained written consent from all participants; for minors, we obtained consent from their legal guardians.

4. Features and Powerful Curriculum and Instruction in Internet-Based Private Tutoring in South Korea

This study aims to understand the characteristics of Korean students' online learning at SE compared to online learning in school. Our analytical focus was to identify the difference between the two. We found four distinctive features of SE's online learning that are different from those of schools. These include individualized learning, effective communication skills in the post-human space, attention skills for cyberlearning, and advanced Internet technologies and tools. The practices of the characteristics provide practical implications for educational administrators and teachers to facilitate effective online teaching and learning, as we discuss in each section. Table 4 presents the key different features between online learning in schools and internet hakwons in terms of the themes of the study results.

Table 4. Key different features between online learning in schools and internet hakwons.

School	Features of Online Learning	Internet Hakwon
■ Majority strictly follow national curriculum ■ No choice of teachers for students ■ Limited evaluation ■ Little personalized evaluation and feedback ■ No checking on individual students' progress on an everyday basis	Individualized learning	■ Increased learning efficiency with personalized curriculum ■ Students' choice from a variety of instructors and lectures ■ Consistent process of evaluation and feedback on daily basis ■ Individualized feedback on student progress without time restrictions
■ Mostly one-way lecture-style class, making interactive communication difficult	Effective communication	■ Instant communication using various technologies (tablet, SNS, smart phone, etc.)
■ Children experience difficulty concentrating in online classes ■ Two-dimensional screen composition ■ Difficulty in using computer graphics ■ Teachers use skills typically used in face-to-face classes	Attention skills	■ Engage students and facilitate their concentration through various visual and sound effects ■ Hire computer graphics experts to develop dynamic and interactive teaching materials ■ Students can concentrate using various multi-dimensional screen compositions
■ Computers and tablets	Advanced technologies	■ Computers, Tablets, AI learning, and evaluation programs, etc.

4.1. Individualized Learning

The first characteristic of online SE in Korea is individualized learning. Individualized learning is the biggest difference and strength between SE online learning and school-based learning, which is why many students and their parents prefer online learning from SE over school-based learning. To be specific, IPT provides students with learning experiences through various curricular programs that are appropriate to each student's academic level and ability. Individualized learning has long been advocated for effective student learning because the learning process of a student with more individualized academic abilities leads to deeper learning and understanding [34]. In addition, individualized learning allows all students to access high-quality learning opportunities that match their academic abilities and needs. There is no doubt that the programs and strategies of individualized learning offered by Internet hakwon have relative advantages over online learning in schools.

First, students and parents stated that the main problem with online instruction in school is that there are no concrete programs and approaches to make each student understand the lessons based on their academic level. All participating students told us that their individual learning needs are not effectively met and their learning difficulties

remain unsolved, leaving them to fend for themselves. Online learning in Korean schools provides instruction for all students in a class that follows the national curriculum, to which teachers are required to adhere. Here, the level of individualized learning is highly limited because of the higher number of students in the class (more than 20), which means that there is a wide range of academic abilities and needs of students. All students listen to the teachers and they are given the same learning activities, materials, and tests. The most concerning aspect of online learning in schools is that students rarely get individualized feedback from the teachers.

However, online learning in SE has been very systematic and effective. It allows each student to learn what they need in a way that suits their academic level, intellectual ability, and learning pace, which is the most obvious reason why so many students prefer SE to schooling [7–9,35–38]. Individualized learning in SE has two approaches, tutoring and acceleration. Individualized learning for remediation allows students who are behind to catch up because they do not have the opportunity to acquire subject knowledge below their grade level; individualized learning for acceleration allows advanced students to acquire subject knowledge earlier than their peers. The approach to these two kinds of individualized learning is to provide students with the opportunity to take courses and online courses that are appropriate to their academic level, regardless of age and national curriculum structures [7,9].

While most Internet hakwons in Korea basically provide individualized learning programs and choices for students, M Internet hakwon is well known for its individualized program. In the case of M hakwon, the cumulative number of enrolled students has exceeded 10 million in 20 years, including elementary, middle, and high schools. It is the largest Internet hakwon in Korea with 50 million dollars of annual revenue, and the largest in the Internet hakwon industry. M hakwon has numerous online courses in terms of levels of subjects (basic, normal, advanced), and purpose of learning (understanding basic concepts, school exam preparation, KSAT preparation, etc.). M hakwon provides individualized learning programs for all registered students. For example, when a student is left behind in math, they can learn math knowledge and contents below their school grade. When a student is far ahead of their peers, they can learn knowledge and contents beyond the national curriculum of their school grade. M hakwon helps students choose appropriate online courses and programs by analyzing their academic level. Based on students' test results and learning progress, M hakwon instructors make suggestions for individual students; often they form an individualized curricular program for a student to follow.

Minsu, a 7th grader, takes online math courses at M hakwon. His math program includes linear equations, which are part of the seventh grade's national curriculum, linear functions, which are in the 8th grade's national curriculum, and polynomial operations and equations and inequations in the tenth grade's national curriculum. Minsu's online learning surpasses the structure of the national curriculum, which is not possible in the online learning of schools. Below is a quote from an interview with Minsu, a 7th grader.

> It is not bad to follow the order of school learning, but I have a desire to learn more things that I understand quickly. So, the parts that I understood quickly became easy to understand even if I studied beyond the grade level. So, I have time to study in the areas where I am lacking in comprehension, and the areas I do not understand well are planned so that I can study in the previous grade or continue.
>
> (Choi's interview, 7th grader)

From the experiences of Minsu, his teacher, Mr. Choi, and many other students, we learn how individualized learning is better implemented in Internet hakwons. The great strength of such an individualized program is that it makes students' learning effective and ensures that they are focused and challenged.

Another example is A hakwon, which specializes in math and English. A hakwon has a total enrollment of about 60,000 students, including math and English, and provides great support in developing new educational technologies by investing billions of dollars in AI. A hakwon develops its curriculum based on the national curriculum, but the curriculum is tailored to each student's level and development without reverting to the grade level of the national curriculum. In other words, A hakwon's curriculum program is different for each student. The logic is similar to M hakwon, and yet A hakwon uses the AI program to create individualized programs for enrolled students. The AI analyzes the students' academic skills in great detail. For the English language, the AI analyzes students' abilities in speaking, listening, reading, writing, grammar, sentence structure, and so on. In math, it analyzes the main three areas: figures, operation, and statistics. In addition, the AI analyzes students' placement tests, learning skills, academic abilities, and learning difficulties, as well as students' wrong answers, the motivation for these errors, and the difficulties in understanding students' problems. Based on this analysis, the AI suggests suitable courses, textbooks, workbooks, test sets, and most importantly, a detailed schedule for the coming months. In this way, A hakwon provides an individual learning plan with a package of curricula, only for a specific student.

For example, Jongyup, a 7th grader, participates in A hakwon's math class. The AI analyzes Jongyeop's notes and small series of tests. Based on the analysis, the system decides whether he needs tutoring and provides additional learning content and materials. In this way, Jongyeop's learning becomes individualized and effective. Below, are the observations of Jongyeop's mother about her son's learning.

> Every child has a different temperament. Even in a subject, like math, kids differ in the areas they are good at. The program evaluates and diagnoses Jongyup periodically as if there is a teacher next to him, and provides lectures and other things, so Jongyeop learns much more easily. Since he found his own pace and learning style, I think he is now interested in learning math and studying his own way.
>
> (Interview with Jongyeop's mother)

Students receive a detailed and systematic analysis of their learning progress by testing their progress in and after each lesson. The main purpose of such tests is to verify that a student has acquired the targeted knowledge and, if not, to provide additional lessons and guidance. When a student receives a test after a lesson or chapter, the AI system, based on item response theory and computer adaptive testing, analyzes the test results in detail, including the score of the test, the reasons why a student answered questions incorrectly, the speed with which the student solved the questions, etc. The key to such an AI program is to suggest to students how to improve their test scores and master the targeted subject knowledge. The AI regenerates the learning program and accompanies the student's learning progress.

Another feature of individualized learning in Internet hakwons is the individualization within a class that is appropriate to each student's understanding and progress. While the cases of D hakwon and A hakwon show how the curriculum is individualized, the case of W Internet hakwon shows how individualized learning is carried out in a class with different academic levels of students. W hakwon has been providing textbooks for elementary, middle, and high schools for 20 years. Based on its own experience in developing textbooks and learning materials, W hakwon has recognized the importance of individualizing instruction for each student. W hakwon is so popular that about 30% of the students who have signed up for online hakwons have signed up for W hakwon.

W hakwon has developed an online teaching and learning platform for online learning. The teacher-student ratio in W hakwon's classes is one to four. The four students receive different learning content displayed on their monitors. The teacher determines the academic level of the students based on the preparatory assessment and understanding in the class. The content of the lecture is presented according to the level of the students: Advanced,

Beginner, and Intermediate. The instructor provides different feedback to each student during the learning process. Students are in the same class, but they learn different content individually.

After class, students receive different assessment materials. Depending on the learning progress and knowledge level of the students in the class, the teacher gives assessment materials to each student. For example, in a life science class, if a student shows a strong interest in cells and has higher visualization skills, the teacher will give them an assignment to draw a picture of cells with the names of the cell parts. In this way, the assignment becomes more interesting for the student, and his or her comprehension and memory skills increase.

There is a relatively new online learning service company named after the concept of personal training (PT). The title of the company and the program underscore how important individualized learning is to online learning. Although it is only two years old, more than 200,000 students across the country have already registered, and the number is growing rapidly. The degree of individualization of learning programs and approaches is the most distinctive and effective feature of online learning at SE, which sets it apart from online learning in schools. Individualization is the most important reason that students generally find learning opportunities in SE [9,39]. Online learning in SE is no different from previous findings. While teachers in schools face the challenge of designing effective online instruction, Internet hakwons in Korea have developed their services so that they are effective for individual students.

4.2. Effective Communication Skills in the Post-Human Space

The second feature of online learning in SE is the opportunities for effective communication with students. Communication between students and instructors is very effective both quantitatively and qualitatively in SE. All participating students feel that communication is much better in online learning at SE than in online teaching at schools. We have found that Internet hakwons and their instructors have specific approaches and techniques to improve communication between students and instructors, especially for student learning. The nationally known teachers of Internet hakwons have special teaching and communication skills that make their courses popular among Korean students and their parents.

Communication has long been acknowledged as a key element of effective teaching and learning, and it is indeed one of the most important features of online learning [2]. To understand the communication of online learning, we shall consider the online classes as post-human spaces where machines have crucial roles [40]; namely, teachers and students do not interact directly but through multiple programs, machines, and processes. All teachers must take this fact seriously if they are to teach effectively and meaningfully. Truly effective communication must be interactive, meaning that everyone's acts of communication must be heard and responded to. In other words, to make learning meaningful, the conditions must be created for individual students to express problems and questions related to their learning that will be heard and answered by instructors. Unlike the offline classroom, communication in online courses is often limited by bandwidth constraints that limit the visibility of body language and paralinguistic cues [41]. Some researchers believe that these limitations negatively impact the efficiency of communication, whereas others argue that this is the unique characteristic that makes online learning and leads to increased or hyperactive communication [41].

Effective communication via the Internet is a challenge for all teachers. School teachers in Korea are no exception. The schoolteachers in this study all admitted that their communication skills in online teaching are quite limited because they lack the knowledge and skills to use communication tools and programs, have limited resources and support to improve their communication skills, and have other professional commitments that do not allow them to prepare for online teaching [42–44]. Some teachers admitted that their efforts to develop such skills were not sufficient, as Mr. Choi told us:

> When I take online classes with my students, it often leads to one-way, information-presenting lectures. Then, the students often get bored. I know. If it were a school, I could induce participation in class by talking directly or through body language, but that is very difficult in the online teaching context. And, although we can talk about the whole story with the program we are using now, it is very difficult to give immediate feedback to each individual student.
>
> (Teacher Choi's interview)

Of course, some teachers have worked hard to develop their teaching skills for online instruction. Their approaches mainly focus on creating online content for all students in classes, which took most of the teachers' time to prepare for online teaching. Some teachers made efforts to promote collaborative learning among students. In online learning, which limits group activities and physical activity, most teachers simply read texts themselves or deliver online instruction with only conceptual explanations [45]. In summary, the schoolteachers mainly focused on basic preparations for online classes, without much time and effort to make them effective for their students.

However, Internet hakwons developed and applied several ways for instructors and students to communicate through various communication methods. In this study, we identified three teaching methods and skills used by Internet hakwons and instructors, which include individualized chat rooms, smart note-taking, and sharing learning outcomes. First, Internet hakwons use individualized chat rooms to favor effective communication with students. Individualized chat rooms are a communication tool embedded into the online teaching platform that Internet hakwons developed and use. As noted above, one of the difficulties teachers feel in online classes is communicating with each student when children are reading texts or when they want to teach only one student and when each individual has a different comment they want to give. Similarly, students feel that opportunities for individualized feedback by instructors have been significantly limited in online instructor-led learning. For example, to solve this problem, E hakwon uses an individualized chat room.

E Internet hakwon has more than 20,000 registered students and helped approximately 2700 students enroll in gifted education programs offered by the public education system. It has 3000 recorded classes for elementary and secondary students. The individualized and interactive chat room is one of the best practices of online teaching. The online class platform allows teachers to monitor individual students' activities and send texts, pictures, and videos to individual students. Through the chat system, E hakwon teachers communicate with their students. The following narrative from our observation notes about the learning of a 6th grader, Minju, illustrates well how communication works in E hakwon's online class.

> Minju, a 6th grader, is learning math in E hakwon. She is listening to a math lecture video, but there is an instructor next to Kyung-hoon virtually. If Minju is doing something else or is dozing while she is listening to the lecture, the instructor sends an emoticon to wake her up. When she solves math questions, the instructor encourages her by sending an emoticon that says "Good job." Not only that, while Minju is watching the video, the instructor asks if she understands or not. "Why did this formula come out?" "Explain this concept to me in chat," "If the number changes like this, how should you solve it?" Minju's learning is evaluated through various questions such as the degree of understanding and how to apply various concepts. At the end of the class, Minju completes the exam questions. The instructor provides further explanations on challenging questions and those Minju got wrong. After the lecture, the instructor recommends a good lecture to help Minju's learning.
>
> After the class, Minju told us about how she felt about online learning.
>
> The biggest problem when I take online classes is that there is no teacher and no one to talk to, so it is difficult to concentrate. And in school online classes,

> when the teacher shows a video or does something, the teacher cannot talk, so I do not think I can concentrate anymore. But here, the teacher sends each friend an emoticon or a warning sound, and questions while I am watching lectures so I think I can study with a little tension.
>
> (Minju's interview, 6th grader)

The second method of communication is the use of smart note-taking. In school classrooms, it is common for teachers to provide feedback to students on their understanding based on their notes. However, in online classes, it is different because it is almost impossible for teachers to see students' notes in real time. S Internet hakwon has developed an intelligent note-taking program to solve the problem of lack of communication between teachers and students. S hakwon specializes in one-on-one tutoring and has recruited 20,000 registered students and 4600 teachers nationwide. Basically, S hakwon provides all kinds of recorded lectures tailored to students' needs and desires. S hakwon is known for its smart note-taking system, which has made it very popular among Korean students. As it is based on one-on-one instruction, an instructor teaches a student intensively and provides feedback. With smart handwriting, the instructor sees the notes students take or solve using a tablet and gives them immediate feedback. Below is a report from our observation.

> An 11th grader, SiJun, is taking a math class. While taking the class, SiJun takes notes of conceptual content on her tablet. Based on the notes, the instructor asks questions about whether she understands. Additionally, the instructor corrects her notes explaining why it is wrong. After class, the instructor presents SiJun with math problems related to today's class. As SiJun checks the solutions she wrote while solving the problem, the instructor gives immediate feedback on what she lacks in solving the problem.
>
> About the system, SiJun said:
>
> I think it was easier to understand because you were talking based on what I had written. If you just listen to the story, you can move on, but I think you can understand it better because you can hear it and see your note-taking and the teacher's comments. And I think it was easier to study because the notes were saved.
>
> (SiJun's interview, 11th grader)

As the system is so effective, attracting many students to the hakwon, S hakwon is implementing the programs not only in mathematics but also in Korean, English, and science.

Third, communication as a means of sharing learning outcomes is another approach that should be used by Internet hakwons. This approach is based on the fact that students want to know their progress and their parents also want to know how well their children are doing in their learning. In this regard, many Internet hakwons provide not only students but also their parents with all learning outcomes such as class activities, test results, and progress reports. T hakwon provides one-on-one tutoring based on each student's learning outcomes. T Internet hakwon is also known for individual tutoring and is growing rapidly with more than 200,000 students.

Instructors of T hakwon analyze the learning outcomes based on the contents of the students' learning materials and evaluation. The instructor shares the outcome with parents and students, focusing on the student's improvements and limitations through an individualized video conversation. The instructor also suggests the direction the student should follow for improvement. Through this one-on-one conversation, students feel proud of their progress and eager to study their shortcomings, and parents feel proud by confirming their child's development. T hakwon cumulatively records and consults all these results, stimulating students' desire for learning. Below is a 12th grader, Ji Hyun's experience with T hakwon.

> The teacher made a set of learning materials including workbooks only for me. She told me that I lack a clear understanding of basic concepts in math. Thus,

> she formed a set of contents and explained to me how to learn them. Every day, yes every day, she checked my learning progress and I was able to ask questions whenever I needed. Eventually, my level was moved up to an advanced one. My Math grade at school moved from the third to first level which was the key element to entering Yonsei University I want to enter.
>
> (Ji Hyun's interview, 12th grader)

We have discussed three major approaches and skills that Internet hakwons and instructors use to enhance communication with students for the purpose of providing individualized feedback and guidance. This study confirms that communication is an essential element for effective teaching and learning and it is effectively actualized in Internet hakwons in Korea.

4.3. Attention Skills for Cyber Learning

Capturing student attention is a critical issue and more challenging in online courses than in traditional face-to-face courses because the separation of student and instructor is a fundamental definition of cyber learning [46]. Given this challenge, online instruction must be different from face-to-face instruction, especially in terms of faculty attention to cyber learners. Student participants all feel that they easily and often lose attention to instruction in online classes. Many students feel that they are more inattentive in online classes taught by schoolteachers than in those taught by Internet hakwons. We identified some skills and efforts that Internet hakwon teachers use. Attention is a state of consciousness in which the senses are focused exclusively and selectively on aspects of the environment [47]. Attention is considered one of the key elements for student learning and has become even more important in online learning because the nature of online instruction makes it difficult to capture and sustain student attention [47,48]. In this regard, researchers and practitioners have desperately sought ways to maintain student attention in online courses. The general conclusion is that the use of technology leads to a decline in student attention and attentional capacity. In their comprehensive analysis and discussion of attention in the digital age, Lodge and Harrison (2019) suggest that more research and nuanced understanding of attention is needed to develop applicable tactics for practitioners.

As mentioned earlier, teachers in Korea all face great challenges in getting the attention of their students. They have tried, for example, calling distracted or sleeping students by name, asking questions of students, getting them to talk during class, giving them assignments to turn in during class, organizing group activities in separate rooms, and giving minus points as punishment to those who do not pay attention. These approaches sometimes work, and sometimes they do not. In general, while teachers try hard to find effective ways to get students' attention, it is never easy for everyone. In this study, we found techniques that Internet hakwon teachers use in their online lectures.

All participating students think that the lectures and courses of the Internet hakwons are more interesting, fun, and enjoyable than those of the schoolteachers. This is because the hakwon teachers develop and use special technologies and skills to make their classes interesting so that students stick with them. These include computer graphics, a special way of speaking and performing, and dynamic video.

First, computer graphics (CG) are often incorporated into lecture videos of Internet hakwons, which would not be readily possible in traditional face-to-face instruction. Different Internet hakwon instructors use CG in different ways for their lectures. One of the instructors who effectively uses CG is Mr. S in D hakwon. Mr. S is known for his effective use of CG in his lectures. He is the most popular Korean history lecturer among both Korean students and adults. More than half of the Korean elementary and secondary students who take ingang for Korean history chose Mr. S's lectures. He uses CG in three ways. First, he uses CG, to tell historical narratives. The history contains stories told by various imaginary animals and people of the time. It is not easy for students to put themselves into the words of the lecturer in such a story. Moreover, it is almost impossible to reach the stage of imagining, understanding, and memorizing in a two-hour lecture. Therefore, Mr. S uses

CG, which overlays the blackboard and himself, to help students understand what they need to imagine when telling a historical story. Second, he uses CG, when talking about historical relics. One of the characteristics of Korean history examination is that various production techniques, forms, and structures of historical relics are asked as questions. However, it is difficult for students to grasp these ancient structures simply with words. Therefore, when explaining historic relics in his class, Mr. S. shows the structure of the relics in CG or provides additional video materials so that students can easily understand them. Third, he uses CG to make his lecture more interesting and dynamic. For example, when talking loudly, CG bombs are added with sounds or shining effects from behind him. In this regard, Mr. S's lectures allow students to focus their attention, even throughout the two-hour lecture.

Second, distinctive ways of speech and appearance are also commonly used among ingang instructors. The essence of imparting knowledge to students through the words of a teacher is no different than online or offline, in school, or in a hakwon. Online hakwon teachers focus on this essence and use their own distinctive way of speaking so that what they say can be easily absorbed by students and increase students' attention. Mr. J, a representative lecturer in math ingang, has amazed many students with his extravagant speech and now stands at the top of online math lectures. Not only does he teach the class well, but he also keeps the children focused by telling stories in the lecture in his own way that the students will enjoy. In fact, many ingang instructors develop their own styles of speech, intonation, and colors of voices as Table 5 shows.

Table 5. Speech styles of nationally recognized instructors.

Tutor	Subject	Number of Enrolled Students	Styles
Mr. S	Korean History	1,200,000	Theater-based talks and lectures
Mr. R	Korean language	200,000	Action-based behaviors and gestures
Ms. L	Social studies	1,000,000	Use of life history of successful college students at Korean IVY League Students
Mr. B	Science	200,000	Use of advanced computer graphic materials

In addition to using distinctive phrases, ingang lecturers pay more attention to their clothes, such as a variety of dresses and makeup, rather than prominent ties, in order to make the academy's students focus more on lectures and have fun. Ms. L. is the most famous social studies teacher and is famous for her pretty appearance, teaching skills, and gorgeous clothes. In an interview, she said that she was a kind of technique to satisfy students' desire to go to college vicariously. With colorful dresses and makeup, she always dazzles her students' eyes and makes them concentrate. In another case, Mr. J, one of the famous math teachers, dresses up in different costumes and uses a shovel to provide a fun teaching experience. By using the shovel instead of a pointing stick in the actual lesson, students can get their interest. In addition, Mr. J gave students a way to look forward to class by performing cosplay for national anniversaries. In addition, the clothing was coordinated with the content of the study so that students could better focus on the lesson.

Third, dynamic video recording is another feature of ingang lectures that helps students focus. The ingang lecturers use various recording techniques in their lecture videos to help students concentrate. As often reported [49–51] (reference), online learning runs the risk of losing students' attention and making them bored. This is the case when the recording angle of online lectures is static and does not move. In the online lectures of teachers, there is no zoom and camera movement. However, the Internet hakwons hire film producers to attract many students. Mr. B, a renowned life-skills instructor at a high school, uses various filming techniques to grab students' attention. The first greeting begins with his upper body in front of the blackboard. Then the scene disappears as the lecture begins in full. The screen suddenly rotates. When Mr. B asks a yes or no question, the camera

moves up and down or left and right as if he were answering the question, creating the effect of students nodding their heads during class. It also zooms way out when using the blackboard, and when only one word is in focus, it zooms in to help students find a clear point in the lecture. He also employs filming techniques that can instantly reawaken students' concentration, such as rotating or exploding the screen. Another math teacher, Ms. S., is known as an ambidextrous teacher. When she writes on the board, she uses both hands to make notes on the board. When the teacher explains the concept, the screen changes to the right, and when the teacher explains the problem, the screen changes to the left. This can be a little dizzying, but the skillful turning of PD overcomes this by using turning techniques that are not confusing. In this way, online hakwons provide students with fun and focus by supplementing simple online courses with dynamic and entertaining shooting techniques.

4.4. Advanced Internet Technologies and Tools

The final feature of online learning in SE is the use of advanced technologies and tools. The use of technology in teaching and learning is controversial among educational scholars and practitioners. Yet, in the digital era, it became unavoidable. Additionally, today's students are called "Net generation" [52], "digital generation" [53], "digital natives" [54], and "digital child" [55]. The new generation has produced a new culture of learning and daily life that requires skills, such as participation, information access, communication opportunities, and content production [53]. Shadow online learning incorporates various technologies and technological tools to make learning more efficient and engaging for today's students.

As mentioned earlier, the Korean government has invested a lot of money in the transition to digitized teaching and learning, perhaps the most advanced in the world. But, how public schools and teachers incorporate these technologies varies from school to school and teacher to teacher. Some Korean teachers are ahead of their peers in using advanced technologies in the classroom. However, many of them still struggle to acquire effective knowledge and skills to use advanced technologies [56].

The SE companies that offer ingang, of course, sell the technological devices—various state-of-the-art digital machines and gadgets such as smart tablets, virtual reality/augmented reality tools, smart workbooks, smart notebooks, and smart pens. They make learning more effective and enjoyable for today's students, who are a very tech-savvy generation. The Figure 1 below shows the advanced technologies used in online learning in schools and SE.

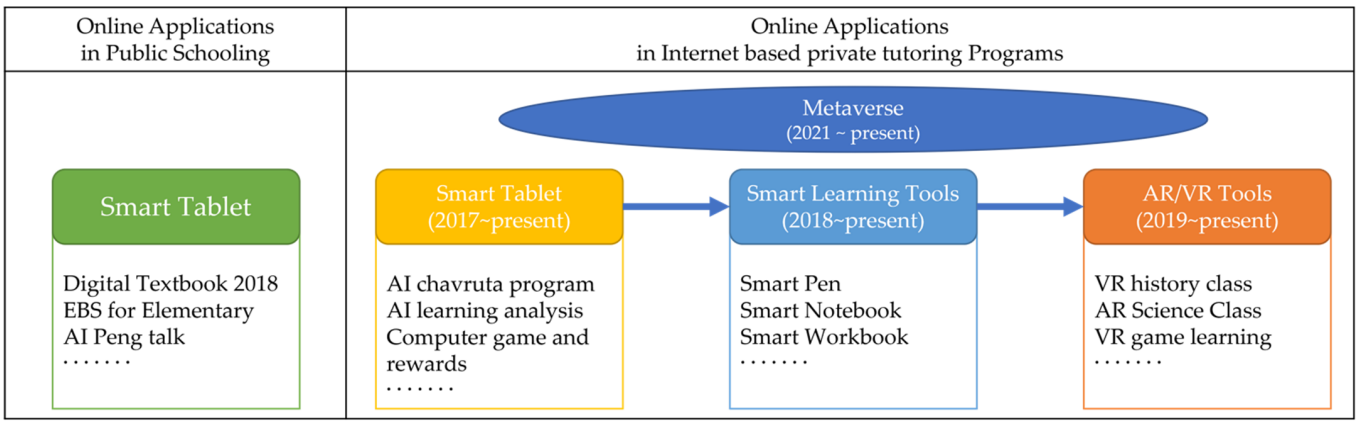

Figure 1. Online applications used in schools and SE.

The use of smart tablets is the most basic aspect as it is used by all Internet hakwons in Korea. Access to information is one of the main characteristics of the digital child, as Erstad [53] has noted. With the smart tablet, students can access all the learning resources provided, such as all the lectures of the hakwon, digital textbooks, workbooks and test

sheets, analysis and data on learning progress, and even extracurricular activities. The use of the smart tablet is the main feature of the Internet hakwons, while it is used by teachers only occasionally and as a supplement. It makes students aware of learning and class time, and displays content and assessments for daily learning. The use of technology by ingang hakwons differs from that in schools mainly in that the tools and programs function in a synchronized manner, which makes them systematically more effective. The focus is on the smart tablet.

Smart Workbook, Smart Notebook, and Spart Pen are also often used in Internet hakwons. When a student writes something in the smart notebook, it is automatically saved and transmitted to the instructor so that the instructor can check the student's progress and provide feedback. When a student solves questions in workbooks, the student's answers are also saved so the system and instructor can check the student's progress. If the students answer the questions incorrectly, the system suggests certain micro-content that could help them understand the targeted knowledge. Smart pens are also connected to the smart tablet. When students point to content in the smart workbook or textbook, the tablet displays the corresponding learning content so that students can access it immediately. The VR/AR tools are useful for learning subject knowledge that needs to be visualized, such as chemical reactions, the deformation of a figure in math, historical events, geography, etc. With these tools, online learning for Korean students becomes very effective and fun without wasting much time searching for appropriate resources. Below is a middle school student's testimony about using such tools.

> If you use a notebook to take notes, eventually, after a year, the notebook will wear out and you will not be able to write. And there is the hassle of having to find it every time you need it. However, if I use Smart Note, all the notes I take while studying are cumulatively saved, and when I send my notes to the teacher, they give me feedback right away. That is why I prefer using a smart notebook.
>
> (MinJung's interview, 10th grader)

In addition, the online learning of Korean students in SE is supported by various advanced programs such as the presentation program, metaverse, AI chavruta program, AI learning analysis program, and computer games. First, students taking ingang can share their notes and presentation videos with students taking the online course. In this way, students' learning becomes more authentic and up-to-date. The image shows a list of student presentations that can be shared on the ingang websites. The chavruta AI program complements the interaction of instructors with students. As there are too many students in an ingang course, hakwons use AI programs to support student learning. The AI instantly analyzes student questions and discussions and provides useful feedback in the form of conversation. Metaverse is a post-reality platform with a multiuser environment that merges physical reality with digital virtuality [57]. It gives students a sense of belonging in a classroom or study space. Learning online can often be lonely and students may feel isolated. To help students with such feelings, ingang hakwons often provide a metaverse where students log in and have a feeling of belonging to study together with instructors and other students. The gaming of learning is another element to make online learning fun. When students study harder and get many questions right, they get rewards such as gift vouchers. When students study on a gaming platform, they feel less bored, and learning through repetition becomes enjoyable.

In addition, ingang hakwons in Korea have developed various applications for smartphones and computers, such as an English grammar learning application, an English word memorization application, a textbook application, an AI math application, and a learning management application. The following are Korean students' experiences with these applications.

> In general, the only way to evaluate whether I have studied this well is the test. And the teacher always says that I need to be able to explain this to be perfectly learned, but there is no place where I can tell such a story right now because of

> Corona. But I think the AI Hubruta program allows me to ask questions and answer questions, so that I can check the parts I do not know or whether I have learned correctly.
>
> (DongYup's interview, 9th grader)

> I tend to study harder when there are other people's perspectives. But when I study alone, I do not have that kind of gaze, so I keep doing other things. But in the metaverse study space, other friends are checking to see if my avatar is studying, so I think my friends are actually looking at me. So I study harder. Also, it gives me a sense of studying together and competitively.
>
> (Minju's interview, 11th grader)

The use of cutting-edge technology in online learning perhaps best characterizes online learning of the future, where individual students have full access to learning options and materials, the ability to share their learning with others, and constant and immediate support from a variety of technologies. As the use of technology has become an inseparable part of student learning and daily life, this research finding may be a natural consequence.

5. Conclusions

This study aims to understand the features of online learning of SE in comparison to those of schools, which makes it effective and attractive to Korean students. This study reveals that while schoolteachers exert considerable effort into making their online teaching effective, Korean students and their parents prefer online learning of SE over that of schoolteachers. Through the study, we identified four particular characteristics: individualized learning, instruction through effective communication, student attention skills, and advanced Internet technologies and tools. The research findings reveal not only the characteristics of Korean students' online learning in SE, but also why so many Korean students use ingang courses for their learning and academic success. Understanding the practical approaches, methods, skills, and tools used in online learning in SE would have some practical implications for teachers and policymakers in the field of education.

The features of online learning in SE that we discussed in the research result section may not be the only solution. Additionally, some of these features would be rejected by schoolteachers or be highly difficult for them to use in schools. For example, the skills of video shooting and the effective use of space might not be available to schoolteachers as Internet hakwons hire experienced and skillful producers for making the lessons videos. However, the students' experiences of online learning in SE reveal why they prefer ingang lessons over school online classes. Considering such features, schoolteachers may find ways to make their online teaching effective and attractive; educational policymakers may be able to think about the elements they need to develop new policies and invest more in educational resources for online teaching and learning in public education.

Online learning has become commonplace since the outbreak of the COVID-19 pandemic, and undoubtedly there will be a growing number of opportunities and circumstances that require teachers to teach online courses, because of not only unexpected pandemic-like incidents but also changing learning trends and student culture in the digital age [9,52–55]. This means that teachers need skills, methods, or competencies to teach online courses and promote student learning, especially individualized learning. Although educational researchers have made efforts to identify and theorize the required competencies of teachers for online teaching, there is still much to discover and understand in order to consider effective online teaching and learning. In this regard, more research on online teaching and learning should be conducted not only in schools but also in SE so that we have enough empirical data to make proper judgments about online course delivery and educational policy considerations.

This study's greatest significance is that it pioneers a new research topic that has been rarely studied. First, it analyzed the characteristics and advantages of Internet classes in SE, which is leading the way in online learning, through long-term observation and in-depth

interviews. In addition, the results of various studies prove that few provide specific data or information for the improvement of online classes in schools. In this respect, this study is valuable because it reveals the charm and characteristics of Internet learning that make it the preferred mode of learning for learners and consumers. As online learning increases, many studies for effective online learning are being conducted; this study is valuable in that it presents practical strategies and examples to which public education and schoolteachers can refer.

Limitations and Future Study

This research analyzed the teaching methods and programs of representative SE institutions. Therefore, depending on the reader, the results presented in this study can be interpreted as moderately extreme cases. However, we have attempted to present the most common cases that we have identified through years of research on SE. The results about public schools are limited to the selected schools and teachers. We, as current and former schoolteachers and teacher educators, have selected representative schools and teachers based on our understanding and experiences of Korean schools. However, there may be examples of unknown schools or teachers' practices with which we are unaware. Considering the limitations of this study, researchers must more actively discover, study, and further theorize effective online teaching-learning in public schools in South Korea.

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