Perceptions of Teachers and Students towards Educational Application of SNS and its Educational Effects in Middle School Class

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ABSTRACT
SNS use by youth is a growing trend. However, there is a lack of studies on how the application of SNS can contribute to learning and public education for youth. As SNS was not originally developed for educational purposes, there is a possibility that it can be used for meaningful educational activity or that its application can lead to the opposite result. This study aims to investigate educational applications and effects of SNS in class through in-depth interviews with middle school teachers and students. Two teachers and 20 students using SNS in the classroom participated in this research. Data was collected through in-depth and written interviews. Course materials were also collected and all data were analyzed. The results of this study are as follows. SNS can be used for not only subject education but also for various kinds of learning activities. Positive effects were found such as expanding the face-to-face communication opportunities of teachers and students, increasing the frequencies of interactions, and widening the spectrum of educational opportunities and variety when properly applied. SNS was also applied for effective class management and student guidance work. However, as negative effects of SNS application including students' exposure to unhealthy information and cyber-bullying were reported, further efforts are needed to identify appropriate methods of using SNS for educational purpose.

INTRODUCTION
Recently, the emergence of the Internet and the development of wireless communications technology have enabled the presentation of education in various methods without limitations of time and place. Along with these changes, usage of diverse Social Networking Services (SNS) such as Facebook, Twitter, Line, and others have been invigorated. Especially, as Internet usage by portable mobile devices has increased due to the development of wireless communications technology, SNS has become a part of daily life for the younger generation.

Though there is an argument that excessive use of SNS interferes with learning in youth, considering the fast growth of SNS as a daily communication tool, it is better to encourage meaningful educational applications than to prevent its use. Public education, the fruit of communication and interaction among teacher, students, and learning contents, can be promoted by the proper application of media that helps communications such as SNS. While past education focused on face-to-face communication between teacher and students or knowledge acquisition through books, recent education has evolved by adapting various media including e-books and smart devices. Highly advanced networks and the spread of smart devices enable more comfortable and diverse applications of SNS as a new educational communication tool (Lim, Kang, & Shin, 2012; Weber, 2012).

There are many reviews on applying SNS as a tool for ensuring the internal stability of school education due to the fact that a majority of secondary school students use SNS for communication. There are also several teachers that currently apply SNS in many areas of school education in a limited manner (Seol & Son, 2012; Choi & Lee, 2012; Kimmons, & Veletsianos, 2014). For example, opinions about specific topics can be shared with individuals outside the classroom through SNS, and students can expand their knowledge acquisition process thorough communication with either a teacher or with peers after school. Therefore, it is necessary to determine how to apply SNS for education and explore the use of SNS in the educational environment to expand the area of learning.

Though the use of SNS by teenagers has been increasing, there is little research on the effects of SNS application on learning and school education. As SNS was not originally developed for educational purposes, it can be used meaningfully for educational purposes or can bring a completely opposite effect depending on the context and users. Therefore, this study aims to investigate the educational application and effects of SNS with middle school teachers and students by adapting the qualitative method. The following are the research questions for this study.

Q1. What are the perceptions of middle school teachers and students towards the educational application of SNS?

Q2. What are the perceptions of middle school teachers and students towards the educational effects of SNS?

LITERATURE REVIEW
SNS Use for Educational Purpose
SNS refers to a kind of social media tool used for communication that brings the offline concept of social relationships into the online space and allows individuals to share their ideas or interests and express their opinions. There are many types of SNS and they are used in various areas such as management, advertisement, or politics (Weber, 2012). Boyd and Ellison (2007) defined SNS as a web-based service that constructs an individual's profile, shares connections created through the individual's relationships, and supports the individual's interactions based on these connections. They (2007) emphasized the individual's autonomous participation in using SNS while declaring SNS as a service that promotes an individual's interactions.

Richter (2008) categorized the characteristics of SNS as follows: personal information management, professional investigation, context understanding, network management, and information exchange activities. SNS supports learning activities not limited to the physical space by expanding learning spaces, enabling learners to take control of the learning process by giving them the initiative, promoting self-reflective learning, and encouraging peer learning (Greenhow & Robelia, 2009). According to several studies, many students admitted that using SNS was good for discussing learning topics and sharing ideas. These activities were confirmed to be helpful for achieving the given learning objectives (Yue et al., 2009; Alloway, Horton, Alloway, & Dawson, 2013).

There are two main reasons for using SNS for educational purposes in school environments. First, SNS is used for improving class quality in the teaching and learning context. Education developed based on the social relationships from exchanged knowledge online can be evaluated through students' activities such as posting their opinions about projects, assignments or discussion topics to their SNS or sharing photos taken during field study with other classmates.

Second, there is a possibility of SNS application not only for curriculum education but also as a communication tool among members of the school community such as teachers, students, and parents. This exchange of opinions should be considered as part of the educational activity in a broad sense. As using SNS to facilitate student communications can enhance the mutual understanding of school members and establish a sense of trust, it is necessary to examine the impact of SNS on improving the quality of education by improving the school culture.

In this study, SNS for educational purposes can be defined as 1) a tool for reflecting or forming social relationships between teachers and students to promote public education in the virtual space, and 2) services that provide either web-based or mobile based information systems as a place for exchange and communication to generate, share, and connect public or private information related with teaching and student guidance.

Effect of SNS on Education
Many studies on the effects of the educational application of SNS were primarily conducted in higher education (Arslan & Sahin-Kizil, 2010; Ellison, Steinfield, & Lampe, 2007; Hung & Yuen, 2010; Wang et al., 2012). SNS is considered to be a tool for promoting interactions in learning and learning outcomes in higher education (Veletsianos, Kimmons, & French, 2013). It was also reported that SNS fosters an environment for students that encourages interactions with external learners and specialists (Amador & Amador, 2014; Kang, Lim, & Park, 2012). Kim, Kim, and Choi (2011) noted that collaborative learning using SNS promoted cooperative reflection and reflective thinking in college students and improved their self-efficacy. In addition, they showed that using SNS in college courses helped students build a social relationship with professors and peers, and also had a positive effect on achieving learning objectives and knowledge creation (Arteaga Sánchez, Cortijo, & Javed, 2014; Wodzicki, Schwämmlein, & Moskaliuk, 2012).

There was a similar result found in research targeting elementary school students. Kim and Han (2011) addressed the effects of discussion using Twitter in elementary school education. They insisted that it improved students' learning outcomes through information exchange and collaborative learning and also had a positive impact on students' satisfaction with learning (Kim & Han, 2011). According to Park and Park (2014), the application of SNS for creating UCC in English classes helped to develop speaking and writing skills, and also increased students' interests and participation ratio in English learning. Another research investigating the educational effects of online collaborative learning using SNS revealed that collaborative learning activities with SNS in elementary school improved students' social efficacy (Leem & Kim, 2013).

However, there is little research on the educational effects of using SNS in secondary education. Most research focused on its effect on students' relationships, with conflicting results. While several studies reported that SNS created a collaborative atmosphere and developed bonding relationships among classmates (Reich, 2010; Siegle, 2010), others reported adverse effects such as the invasion of privacy, harm from groundless rumors, SNS addiction, depression, and bullying (Vandoninck, d'Haenens, Cock, & Donoso, 2011; Landoll, La Greca, & Lai, 2013; Leung, & Lee, 2012).

SNS is widely used as a tool for expressing opinions. Providing smart devices to students facilitates the use of SNS in a new educational environment, and students can engage in various productive learning activities by applying the characteristics of SNS (Lee, Lee, & Kim, 2013). These characteristics are more suited for informal learning, however, they can also be used effectively when the learning is well structured for learners' needs in school education. Therefore, this study aims to investigate how school education applies SNS in educational settings and the perception regarding its effects.

METHOD
This study recruited teachers that actively used SNS for educational purposes in the classroom as well as middle school students with experience using SNS at school in order to investigate the educational application and effects of SNS in middle school from the perspectives of both teachers and students. In-depth interviews about SNS application in education and its effects were conducted. Data was then collected and the results were analyzed.

Participants
With the cooperation of the Ministry of Education, Science and Technology, two teachers who had used SNS in teaching were recruited for this study. These two teachers had served as SMART education-guiding teachers under the Ministry of Education, Science and Technology and used SNS intensively in their class and for other learning activities. Teacher K, a middle school Science teacher in Seoul with 12 years of experience, applied SNS during courses and extra learning activities. Teacher H, a moral class teacher with 6 years of experience, used SNS for classes.

As the target students also had to have experience with using SNS in class, students were selected from the classes of the two teachers based on the teachers' recommendations. 10 students were selected randomly from each school among those who agreed to participate in the interviews. The total number of students that participated in the interviews was 20, with five male and five female students in second and third grade.

Interview questionnaire
Semi-structured questionnaires were developed for in-depth interviews with teachers and students about SNS's educational application and effects. The validity of the questionnaire developed for teachers was tested by a committee consisting of one current teacher and four specialists with more than five years of experience in the fields of educational technology and educational psychology. The validated questionnaire was then used for the first round of in-depth interviews. Based on the results, the questionnaire was revised to enable teachers to better describe their experiences and opinions. The revised questionnaire was used for the second round of interviews. The validity of the questionnaire developed for students was tested by one professor of instructional technology and four postdoctoral researchers (one in instructional technology, one in educational psychology, one in psychology, and one in computer education). The questionnaire was tested for terminology, and two current teachers evaluated the level and appropriateness of the questions. The main contents of the in-depth interview items are described in table 1.

Table 1: Main Contents of In-depth Interviews

Category	Teacher	Student
SNS's Educational Application	. The most appropriate subject or activities that are suitable for using SNS in school . Examples of SNS application in classes or other learning activities and teaching strategies . Scope of SNS application	. SNS educational application? . Does SNS educational application help to improve your leaning in school? If so, why? . Does SNS educational application help you to study at home after school? If so, why?
Effects of SNS Educational Application	. Effects of SNS educational application in school . Students' reactions to SNS educational application, classroom atmosphere, individual changes . Inappropriate SNS educational application in school education and negative results	. Changes in the relationship between yourself and the teacher after SNS educational application . Changes in the relationship between yourself and classmates after SNS educational application . Negative aspects of SNS educational application? . Which aspect of SNS educational application interferes with your study? If so, what are the reasons?

Data Collection and Data Analysis

In this study, data was mainly collected using in-depth interviews and collecting documents. As previously described, two teachers that actively applied SNS in teaching and guiding students as well as 20 of their students with experience using SNS in the classroom were recruited for the interviews. Two in-depth interviews were conducted using the developed questionnaires shown in table 2.

Table 2: Procedures for the in-depth interviews with teachers and students

	Procedure for in-depth interviews with teachers	Procedure for in-depth interviews with students
1st Round	- Participants: Two teachers and five researchers (seven participants) - Duration: About two hours - Free discussion based on the semi-constructed questionnaire - Recording of discussion	- Participants: 20 students, two teachers and five researchers (twenty-seven participants) - Duration: About 30 minutes - Freely described their thoughts in writing based on the printed semi-constructed questionnaire - Recording of discussion
2nd Round	- Distribution of revised questionnaire based on the results of the 1st round in-depth interview - Asking the two teachers to share specific experiences and opinions regarding the questions in detail - Distribution and subsequent collection of emails	- Interview to confirm the answers from the 1st round of in-depth interviews - Additional records with the questionnaire previously completed by the students - Distribution and subsequent collection of the printouts

To interview the students, the printed questionnaires were first distributed and the students were instructed to write down their answers to the questions. This format was employed because the participants are middle school students and may have difficulty with descriptively expressing their opinions and responses to the questions. After this process, interviews were conducted with the students to confirm their responses. The interview contents were additionally recorded in the questionnaires completed previously by the students. The teachers also provided course resources and documents related to SNS application with additional explanation.

All the collected data were used for analysis. While analyzing the data, characteristics and effects of the educational application of SNS were identified. They were labeled, categorized, and summarized. Among the data distributed according to categories, the data on the educational effects of SNS were coded into either positive or negative effects and further analyzed. The three researchers later reexamined the analyzed results.

RESULTS
Usefulness of SNS as an Instructional Medium
Regarding SNS application in class as an instructional method, the teachers emphasized the interactions between teachers and students and between students and students as the primary element of teaching and learning. They noted that SNS application could work as a useful tool especially for investigating, discussing, organizing, and summarizing during collaborative learning activities or project participation through student-student interactions in the class.

> Teacher K: SNS can be effectively used when students' participation is important and gathering different opinions is needed. SNS can be applied to discussions, activities with several procedures and exchanging opinions or knowledge either in the preview stage or during class. It can also be used as a communication tool for after school activities or for providing feedback to each other.

> Teacher H: You can use SNS for collaborative activities. It is especially useful when carrying out small group projects, sharing opinions, or performing any kind of collaborative task as a group or individually. You can upload announcements or other information from the teacher, receive real time updates and provide feedback. It is also good for building relationships with friends or teachers at an early stage.

Figure 1: Example of SNS application in class

These two teachers stated that SNS was useful for learning activities before or during class, providing feedback after class, and forming relationships. In the classes taught by these teachers, the learning objectives and guidance with activities were provided first, followed by collaborative learning activities. Summarizing and presenting the learning activities in front of other groups was the next step. After the sharing stage, students received feedback from the teachers regarding their performances. These teachers applied various teaching strategies when using SNS in their classes. The strategies involved interactivity for solving and achieving common goals, simultaneity for sharing and applying information promptly, collaborative overall activities, communication skills with pros, cons, and various opinions provided, and a fusion of overall activities blending online, offline and individualized learning.

> Teacher H: Students started research through SNS as a group, shared what they discovered by posting on SNS, compared what others did to what they did, and shared their experiences with other groups with different opinions. Further, each group investigated all cases in detail, then organized, and shared the results on SNS with other groups. Finally, the groups presented what they learned based on their SNS postings. As all materials were posted on SNS, students could compare, combine, search, and even post questions or opposing opinions anytime.

Students also had positive attitudes towards using SNS as an instructional method in class. They thought SNS was good for discussions and exchanges with other students, sharing learning materials or information, and asking questions to the teacher. In addition, they were interested in participating in a new trial regarding collaborative learning and solving problems online with students from different schools, which was not possible in the traditional class

> Student 1: It is good for sharing ideas or resources with other students. Not only can things be shared easily and quickly, but I can also add my own thoughts on them through SNS

Student 2: By using SNS, I could stop being judgmental and narrow-minded and got to accept and understand different ways of thinking in a short time.

Student 3: Recently, we had a class at the same time as students from another middle school through Classting. In the class, we discussed the same topic. When a student from one school presented his opinions, students from the other school responded and gave him feedback. Before then, we didn't know each other at all. However, SNS helped us to get to know each other and become closer.

Possibility for SNS Application for Afterschool Activities
SNS was used for regular classes and also for extra educational activities. For example, it was used for 1) delivering announcements or guidelines for class activities such as homework diaries and school newsletters, 2) improving student guidance by providing counseling to students using SNS, 3) establishing a communicative atmosphere in the entire class through sharing photos and interesting information, forming relationships, and promoting friendships, and 4) collaborating and completing group projects when performing creative activities.

Teacher K: The educational approach of SNS application to learning activities besides subject teaching provides opportunities for collaboration, sharing, and participation and leads to the reduction of dissonance by creating a communicative classroom culture. I have tried to use SNS for projects involving collaboration and enable students to help each other thorough SNS application.

Teacher H: In the aspect of class management, I use it for social bonding activities and as a supplementary tool for the homework diary. I promote friendships by having events such as posting each group's photos on SNS and making students comment on each other's posts, posting missing announcements, or highlighting important news that needs to be reiterated so students don't miss them. Students also post questions that they are curious about and seek answers from the teacher or their friends.

Student 4: I liked to use SNS as I was able to ask questions that I didn't have a chance to ask in class, got to know the materials that I had to prepare for the next class, and also talk to many friends at the same time. I also think it was useful for posting links containing learning resources and sharing them via SNS. It helped to get access to materials that I couldn't find by myself and gave me a chance to review the shared supplementary materials.

Positive Effects of SNS: Improvement of Learning Competence and Communication Skill
The teachers noted the improvement of learning competence as a positive effect of SNS application in the class. From examining students' reactions in class, they found improvements in interest, concentration, understanding, and practical ability. Even though they agreed that SNS application was effective for promoting students' learning motivation and increasing interest in learning, they also cautioned that these effects depended on how the curriculum and class design were reconstructed to apply SNS properly.

Teacher H: I could see that students were more likely to speak their opinions and pay attention in class with more interest than in a traditional class when using SNS, however, it was hard to see an actual connection or improvement of the emphatic ability towards other people between the online and offline situations.

The students considered the improvement of learning competence as a positive effect of SNS application in class. They agreed that it helped them understand the learning contents and memorize them. As more supplementary resources are accumulated through SNS, students get to understand the learning contents deeply by studying them. Classes then become more interesting for the students and they are able to participate voluntarily and actively in learning activities. They can search for related information through SNS, find answers during the process, and all these processes help them to memorize what they learn.

Student 5: In classes with SNS application, students discovered more diverse and specific answers by themselves through SNS search. Afterwards, teacher checked and confirmed what the students already found. In this procedure, students were able to participate actively in the learning activities, and I think that is why it was hard to find students who dozed off in the Moral class.

Student 6: Regular classes were boring as I had to present and write by myself, and could only access information through textbooks. However, in the SNS-using class, I could look for things by myself and create a presentation based on them. It was very helpful for me to remember what I studied for a longer period than before.

Improvement in communication skills is another positive effect of classes with SNS application according to the teachers. It was effective as it helped the students participate actively in the class, and developed their communication skills, collaborative skills, and opinion integrating skills. Occasional participation by parents using SNS can also set up a collaborative environment where the school and home can interact and work together.

Teacher H: Students' participation is more essential than teacher's teaching in this kind of class. It is good to have a chance to improve students' communication skills, collaborative skills, and opinion integrating skills by exchange of opinions within the group and collaborations with other groups.

Teacher K: It was very helpful for me to plan upcoming activities and schedules based on the feedback I received from the students. Previously, I had to decide what to do based on my preferences. On the contrary, it was stimulating to construct and organise activites with all class members and students. Parents could observe, monitor activities, and provide feedback. For me, it was a way to come closer to achieving the school community's common goal.

Positive Effects of SNS: Establishment of Friendly Relationships
Teachers also commented that using SNS helped to establish an interactive and vivid classroom culture. They noted that by applying SNS (Classting) into their classes, they were able to create a more open and active classroom atmosphere with the students.

Teacher K: As daily activities affect each class' culture and characteristics, the function of SNS goes beyond just simply recording what happens, but enables us to reach the level of creating a friendly climate where every member of the class takes care of each other and do things together.

Teacher H: Due to the friendly class atmosphere, I found that students spoke their opinions more often during learning activities. I also found that they paid more attention to completing assignments while interacting with each other at any given time.

Students also agreed that SNS application in class was good for building or improving relationships with friends or a teacher. The positive effect of SNS on relationships with teachers was to help students have more friendly communications with the teacher, feel closer, freely carry on conversations and discussions with the teacher or get advice from him or her. In addition, SNS helped with building trust between the teacher and the students and increased communication by providing a counseling outlet that the students could consult regarding their career seeking or personal issues.

Student 7: As the teacher gave us missions and rewarded the students who succeeded, we became friends with him eventually and had more conversations than before.

Student 8: I became really close to the teacher and started to talk about serious things. There was a private chat room where I could talk to the teacher one on one; I could consult with him over my concerns for my dream or other problems. Also, he commented on the postings we uploaded, and I think it gave us a chance to become closer to him.

For personal relationships, SNS served as a space where students could have conversations with classmates with whom they were not close, and they could find clues about other classmates' characters on SNS. They also got along better and SNS improved their unity. In addition, SNS enabled them to become acquainted with each other by allowing the students to share announcements and learning materials, collaborate, and communicate with others.

Student 9: I could understand the personalities and tendencies of my friends by reading their thoughts reflected on postings and it broadened my understanding.

Student 10: Using SNS made me become more familiar with my friends and teacher, and further improved our unity as a class.

Negative Effects of SNS

The effects of SNS application are not just positive. Teachers and students commented on several negative effects of using SNS. These include students' excessive usage of mobile phones for long periods of time, revealing inappropriate facts and invasion of privacy based on rumors, posting irrelevant information, ethical issues with comments, and cyber-bullying.

Teacher K: We found that some students posted irrelevant information, and there were ethical issues with malicious comments in response to these information. Also, there was an issue with parents' negative perception of SNS application.

Teacher H: Groundless rumors spread so quickly and many students believed them as the truth. It seems students tend to have a more relaxed attitude in online space than in offline. This makes them post private photos or reveal facts that another person didn't want to share. Personal information will be easily reproduced as a result. Moreover, cyber-bullying among students can result from using SNS.

The students pointed out negative effects of using SNS in class. According to them, it distracted them from studying, harmed friendships, or even exposed them to unhealthy information. For example, if the teacher did not check the SNS space and provide feedback, there was a possibility of spreading bad rumors about classmates or cursing each other. Thus, the space needs to be monitored and guidelines provided. Moreover, as students tend to use SNS excessively, it is really important to help students set limits to decide how long they will use SNS daily, and follow their own rules.

Student 11: As I become distracted with games or other stuff on the Internet after logging onto SNS, I spend more time on the Internet surfing rather than focusing on studying.

Student 12: I couldn't concentrate on the class as I was thinking of what to post on SNS and even bad rumors about other classmates.

Student 13: It interferes with studies if you use SNS for non-educational purposes. During the class, I open my cell phone and access SNS to check new posts and I am curious about what other friends talks about.

Teachers suggested ways to decrease the negative effects of SNS application. These include using SNS with a specific purpose, implementing information ethics education about the etiquettes of SNS usage, and teacher efforts to supervise the SNS space and professionalism.

Teacher K: An orientation to understand the function of SNS and information ethics education about postings and Internet culture should be provided before applying SNS in the class. This means that we need to use a closed type of SNS optimized for the educational environment.

Teacher H: An information ethics education session is mandatory and its importance should be emphasized to the students. This is something that should be used not only for preparation but also something we always address and discuss.

CONCLUSIONS

This study aims to investigate the perceptions of teachers and students towards educational applications and effects of SNS in middle school classes through in-depth interviews and provide suggestions about how to apply SNS to ensure the internal stability of public education. The summarized primary implications are as follows.

First, teachers applied SNS for searching, discussing, summarizing, and facilitating collaborative activities in subject matter education. They also guided students to use SNS for previewing and reviewing in addition to providing feedback and announcements through SNS. Students shared the teachers' attitudes towards using SNS. They stated that they used SNS for discussion, sharing information or resources, and asking questions. In consideration of these findings, as students can make use of SNS for exploring resources, learning activities and communication with others,

there is a possibility of using SNS to help students communicate with others by setting up a network of students with specialists, parents, seniors, and teachers, promoting richer research information and exchange, and further help to provide more various and in-depth education. As an example of SNS application for other activities, it was used as a communication tool between teachers and students mainly for announcements or class management, educational guidance by counseling, forming personal relationships or friendships, and creative activities. In addition, SNS could be used for posts to parents regarding their children's class materials or homework. Using these SNS functions, the tool can be applied to support teachers with attempting diverse activities for communicating with students and parents. This expansive communication will be helpful to prepare for and prevent school violence, as well as to guide extracurricular activities, and class management. It was found that teachers adapted the strategies of interactivity, simultaneity, and communication, used various methods to encourage external motivation and customized individual guidance to promote students' participation.

Second, teachers reported the positive effects of SNS application in class as improvement of students' learning competences, interactive classroom atmosphere, developing students' collaboration capabilities and improving communication skills. Students also considered the positive aspects of SNS application as promoting learning activities, after-school activities, improving memorization of learning contents, and establishing personal relationships.

However, as there is always the possibility of being exposed to the negative effects of SNS, implementation of prevention and ethics education programs on SNS usage etiquette, hours of use, and cyber-bullying, in addition to teachers' guidance and control over students' SNS usage are strongly recommended. Recently, cyber-bullying came to the fore as a serious social issue. Social media use by youth can result in bullying, and solutions that can cope with different types of youth friendships are required. Therefore, above all, it is necessary to educate both teachers and students to be aware of the dangers of the negative effects of SNS application in class and prevent these effects before applying SNS in class.

As shown in the results, there are many advantages of SNS application in education. However, there are also things to be considered before SNS application in class.

First, to initiate meaningful educational activities using SNS in class, there should be effective strategies and efforts to encourage students' participation under the instructional design context. SNS may provoke students' motivation as a new medium, however, for them to keep using it, teachers should employ sophisticated instructional strategies. Teachers need to maintain students' interests and participation by providing helpful resources for learning through posting photos or videos that record the progress of students' activities.

Second, selecting the proper SNS that fits the purpose is very important when planning to use SNS in school education. Based on the results of this study, SNS can be used as a tool not only for communication, but also for sharing diverse materials. However, there are differences in the functions of existing SNS tools. Some of them limit file sharing or uploading materials, which are considered the most important features of SNS for educational activities. Therefore, teachers should research the SNS functions they need to use in advance, select the right one, and also consider using a supplementary service simultaneously.

Third, to apply SNS in public education, there are many things that should be considered. As students can access external websites in the cyber space due to the Internet's openness and connectivity, it is necessary to prevent misuse of SNS application by educating students to recognize the possible ripple effects from their postings and admonish them not to post contents that damage others. Issues of exposure of teachers' privacy have to be considered as well. In addition, it is important to foster an atmosphere that can establish a formal relationship with students through SNS.

As there was a lack of empirical studies regarding the contributions of SNS application in school education, this study investigated potential methods for applying SNS for educational purposes based on the perceptions of teachers and students and provides suggestions on reinforcing public education through SNS application. However, there were difficulties when choosing the study subjects. There were few teachers and students with experience using SNS for educational purposes in class, as the application of SNS is not yet common in schools. Thus, it is hard to generalize the results of this study. Based on this research, future studies should be conducted to determine other methods of applying SNS to reinforce public education in the future.

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