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Implementation of *SMART Teaching 3.0*: Mobile-Based Self-Directed EFL Teacher Professional Development*

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Motivated by the paradigm shift from top-down, institution-centered teacher training to bottom-up, learner-centered professional development in teacher education, this study involved the design and implementation of *SMART Teaching 3.0*, an online, open-learning course for EFL teacher professional development. This program was designed to be self-directed, motivating, applicable, rich, and technology-supported. It was further distributed to 149 English teachers for five months for testing. Data were collected from various sources such as website statistics, comments, weekly journals and interviews. Overall, the results confirmed the effectiveness of the five key features but to different degrees. The participants joined and participated in the program without any requirement or incentives. They perceived the needs-based content as being motivating, although they still wanted updates and an expansion of the content. Some of them applied what they learned in the program to their own classes. Finally, the mobile-based program enabled teachers to use the program without time and place constraints. However, the issue of the sustainability of self-directed learning was raised in the process of implementation. Several suggestions were made to solve the issue.

Keywords: teacher education program, teacher professional development, mobile learning, bottom-up, self-directed learning, MOOC, open learning platform

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Introduction

Along with the incessant evolution of technology, learning paradigms have changed, and new types of learning rapidly emerge world-wide in education. Not only is the focus of learning moving from teachers to learners, but also the whole process of constructing, selecting, presenting and sharing knowledge is beginning to be determined by learners. New learning concepts, such as collective intelligence, social learning, massive open learning, flipped learning, ubiquitous learning and informal learning are now becoming part of our education. Likewise, teacher education paradigms are also changing. The traditional top-down term, 'teacher training', is being replaced by 'teacher professional development,' which is more bottom-up. Furthermore, a variety of new types of teacher education have been introduced recently such as online teacher education, school-based consulting (Chang, Kim, & Choi, 2012), integration of in-school and off-site teacher training (Lee, 2010), etc.

Despite all this, the huge paradigm shift does not seem to have critically influenced the education of English teachers in Korea. English teacher training programs in Korea remain top-down and the old pitfalls were not avoided in the current teacher training programs (Min & Park, 2013; Park, 2006). First, the content is seldom aligned with teachers' wants and needs since it is a training institute or a curriculum developer who determines the curriculum (Chang, Lee, & Jung, 2011). Second, it is difficult to apply this training to English classes because information gained from the program is neither very practical nor sufficient (Kim & Ahn, 2011; Chang, 2007). Third, learning effects do not last long mainly because programs are offered only once, lacking follow-up activities (Kim, 2009; Lee, 2006).

Accordingly, a professional development model for 21st century EFL teachers needs to be designed considering changing learning paradigms, supporting technologies, and problems in the current teacher training programs. This study attempts to define the key features of this new model as SMART: *Self-directed, Motivating, Applicable, Rich, and Technology-supported*. First of all, the new model should be self-directed so that teachers can choose learning content according to their own needs. No fixed curriculum should be given. Second, the content should satisfy individual teachers' needs, which would motivate teachers to voluntarily participate in the program. This represents a bottom-up approach because curriculum and content would be determined by individual teachers. Third, acquired knowledge should be applicable. To make learning applicable, the content should be relevant to teachers' on-site needs. Fourth, sufficient content should be provided so that teachers can take what they need from a rich bank of resources. Finally, new technology should effectively support the learning system. Mobile technology can make learning ubiquitous and more interactive, so that teachers can easily bring their learning into their classrooms.

Based on these features, this study has developed a new mobile-based teacher education program entitled *SMART Teaching 3.0*.¹ *SMART Teaching 3.0* is available on both desktop computers and mobile devices. It consists of 42 video clips whose total running time amounts to 570 minutes. All the content was selected and provided by English teachers themselves, following a bottom-up approach. The purpose of this study is to suggest a new learning model for English teachers and validate it with Korean English teachers by implementing *SMART Teaching 3.0*. This study addresses the following research questions:

- 1) How did the Korean English teachers use and learn from *SMART Teaching 3.0*? Do the results validate the five key features of the program?
- 2) What problems and issues emerged in implementing *SMART Teaching 3.0*?
- 3) What changes should be made for *SMART teaching 3.0* to serve as a new EFL teacher education model in the future?

¹ The name was inspired by the pedagogical features of the new learning paradigm and 'web 3.0' which is another evolution of web 2.0.

The Current State of EFL Teacher Education in Korea

In recent years, teacher education has experienced a paradigm shift from teacher training to teacher professional development (Burns & Richards, 2009; Chang, 2000; Crandall & Miller, 2013; Johnson, 2009). The differences between ‘teacher training’ and ‘teacher professional development’ are well defined by Chang (2000) in Table 1.

TABLE 1
The Paradigm Shift of Language Teacher Education (Chang, 2000, p. 238)

Training-Centered Traditional View	Development-Centered Current View
delivery mechanism	learning process
skill/technique/knowledge-based	attitude/awareness-based, towards personal growth/development
competency-based	holistic
product/certificate weighted	process weighted
means one can get a job/promotion	means one can stay interested in one's job
one-off, short term	ongoing, long term
compulsory	voluntary
top-down approach to change	bottom-up approach to change
external agenda	internal agenda
mostly done with experts	can be done with self/peers
trainer-centered syllabus	trainee-centered syllabus
teacher as the recipients of change	teacher as the subject of change

The teacher training paradigm is based on a top-down knowledge transmission model. In this model, experts select and deliver knowledge and skills which are supposed to be necessary to teachers. Teachers' roles in the process are generally passive in that they are the recipients of training as well as the objects of change. Training programs are often compulsory and one-off, focusing greatly on the product. In contrast, the teacher professional development paradigm emphasizes the learning process during teacher education. Adopting a bottom-up approach, it assigns a central role to teachers themselves. It is teachers who determine the agenda and take charge of their own professional learning. Their participation in teacher education programs is voluntary and continual because it is based on their internal needs.

In recognition of this new direction of teacher education, it is an empirical question to what degree the professional development paradigm has been incorporated into actual teacher education programs. In Korea, the concept of teacher professional development has been increasingly accepted by researchers and trainers but its acceptance into programs is still in the incipient stage. Research on current English teacher training programs in Korea has revealed various issues and problems. Lack of applicability is one of the recurring issues in the literature. Although teachers perceive that training programs increase their competence in English and teaching skills, they are in need of more practical content and methods which are readily applicable to their everyday teaching practices (Kim & Ahn, 2011; Chang, 2007). Teachers also point out problems such as trainers' lack of understanding of English classes (Chang, 2007; Na, Ahn, & Kim, 2008; Yang, 2009), a large class size with mixed levels of English proficiency (Park, 2006; Yang, 2009), and no follow-up support after training (Kim, Kim, Lee, & Woo, 2010; Chang, 2007).

After reviewing the current English teacher training programs in Korea, Min and Park (2013) provided insightful suggestions for future teacher training programs. Particularly relevant to the present study are the following suggestions. First, a bottom-up approach is needed, where teachers themselves initiate, develop, and implement programs. Second, training programs need to be provided in various tracks so as to meet different needs and purposes of individual teachers. Curricula should be field-based rather than theory-based so that teachers can apply what they learn in training programs into their own classes. Fourth, trainers should have a

sound understanding of the school environment with adequate professional training. In this regard, English teachers themselves would be suitable candidates for trainers. Fifth, post-training support should be provided to maintain the effects of training. Interestingly enough, these suggestions correspond exactly to the features of the new teacher professional development paradigm presented in Table 1. This indicates that the transition from training to professional development has not yet taken place in Korea, emphasizing the need for more programs which are bottom-up, teacher-centered, and field-based.

In developing such programs, the role of technology should be actively considered. Online teacher training programs are nothing new in Korea any more. Since they were first introduced in 2000 for 1,820 teachers, these programs have rapidly increased to the point where there were 400,790 participants in 2012 (Gu, 2014). More recently, mobile-based teacher training programs have begun to emerge (Kim & Lim, 2013). These online or mobile-based programs benefit from diverse contents, self-control of learning pace, easy access without being constrained by time and place, etc. However, current online programs do not fully utilize the potential benefits of technology in that they simply replicate offline teacher training programs. For instance, Kim, Lee, and Lim (2015) evaluated three online English teacher training programs and found that the programs are still top-down, do not provide opportunities for reflection, and lack sustainability and applicability. To redress these problems, they proposed a model for online teacher education programs which consists of three key elements: a bottom-up curriculum, reflection for classroom application, and communities of practice for sustainability of development.

Guided by the suggestions proposed in the literature, the present study developed *SMART Teaching 3.0*, a mobile-based, self-directed teacher professional development program adopting a bottom-up approach.

Method

Participants

The implementation of *SMART Teaching 3.0* was conducted to confirm its smooth operation and validate the key features of the program. Participants were recruited in February, 2016. Invitations to participate in the program were sent to in-service English teachers' mobile chat rooms via SNS. Initially, 130 teachers responded, 81 of whom completed online registrations. After being provided with an orientation video on how to use *SMART Teaching 3.0*, they began to use the program from March 1st. As time went on, however, the number of visitors declined. Thus, a second round of recruitment was initiated in late April. This time 192 teachers responded and 68 of them joined the program. 149 teachers in total registered for *SMART Teaching 3.0* and used it until the end of July. Table 2 presents the background information of the first and the second cohorts of the participants.

TABLE 2
Background Information of the Participant Teachers

		1 st Cohort	2 nd Cohort
Gender	Male	10	3
	Female	71	65
School Level	Middle	46	38
	High	30	29
	Other	5	1
Teaching Experience	0~5 years	68	36
	6~10 years	7	14
	11~15 years	2	11
	Over 15 years	4	7

Learning Program: *SMART Teaching 3.0*

SMART Teaching 3.0 is an online open learning platform designed in the course of this study as a key solution for suggesting a new teacher professional development model. The idea of *SMART Teaching 3.0* is to provide videos in a mobile-based MOOC format such as Cosera² so that teachers can voluntarily and instantly study and utilize learning content for their own purposes and needs anytime, anywhere. The online platform was developed with mobile friendly technology such as ‘responsive web design (RWD)’ and a web application framework. Thus, users can see the layout of webpages which is automatically and optimally adjusted to their viewing devices such as desktop computers, mobile phones, or tablets, as illustrated in Figure 1.

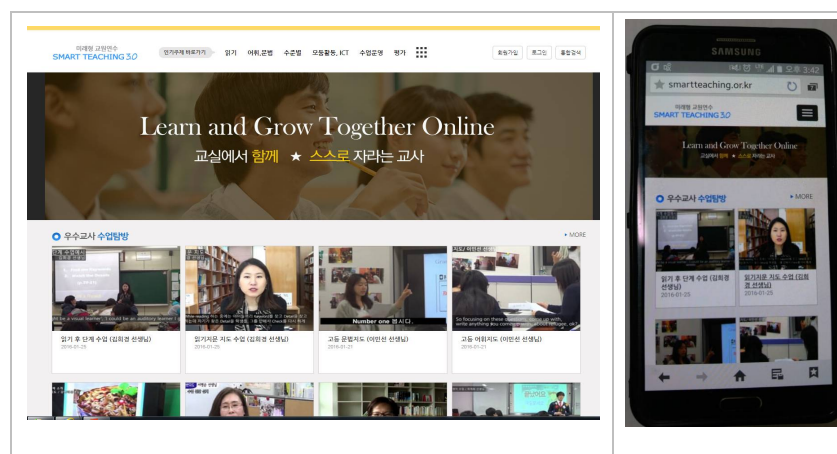


Figure 1. *SMART Teaching 3.0* on a Desktop Computer and a Mobile Phone (<http://smartteaching.or.kr>)

The content was identified by triangulated needs analysis from a survey and interviews with Korean English teachers³ and exists in the form of short video files with less than fifteen minutes running time. All the participants in the videos are actual English teachers and their students. The menu consists of four categories: 1) *Virtual class tour* 2) *Tips & Issues* 3) *Teachers' stories*, and 4) *Screen lectures*. More specifically, *Virtual class tour*, the largest category, includes 27 sample lessons performed by expert English teachers in their regular classes with their own students, and are systematically arranged by topics (e.g., reading, writing, speaking, grammar, vocabulary, evaluation etc.), language proficiency levels (ex. high, low), age levels (e.g., middle, high), or teaching process (e.g., pre-reading, while reading, post-reading) etc. In *Tips & Issues*, experienced teachers' trouble shooting tips (e.g., quick attention gathering methods) are presented in a collection of interview clips to help less experienced teachers, and keen ELT issues in Korea are brought up and discussed by specially-invited English teachers in a round-table discussion format. In *Teachers' stories*, similar to the well-known TED talks, four English teachers describe their own first-year teaching experiences, and two college students talk about their unforgettable English teachers. Finally, in *Screen lecture*, master teachers provide more in-depth lectures on issues such as how to develop good test items, or how to deal with students of different English proficiency

² Cosera <https://www.coursera.org/>

³ In order to identify English teachers' needs, we conducted in-depth interviews with eight English teachers, whose teaching experiences varied from three months to 25 years. In addition, we asked one teacher to list all the tasks she performs as an English teacher in her classes as comprehensively as possible. Based on the findings from the interviews and the task list, we developed online survey questionnaires, which were administered to 226 English teachers via Google Docs. For details, refer to Lee and Kim (2016).

levels in one class.

SMART Teaching 3.0 has five major features as illustrated in Figure 2. First, it is designed for *self-directed* learning. Thus, in the absence of any requirement or fixed curriculum, teachers can voluntarily and freely search and study the content. Second, it provides new and various types of presentation such as storytelling, class observation, panel discussions, interviews, and screen lectures, which is expected to be *motivating*. Third, the topics and teaching samples were selected based on teachers' needs and designed to be specific and small instruction units (for example, instruction tasks for pre-reading), which enhances *applicability*. Fourth, it has *rich* content in terms of quantity (a total of 42 video files) and the range of topics. Furthermore, the files can be easily uploaded and shared, so that content can be added and deleted according to future needs. Fifth, it is supported by up-to-date technology. The websites were developed to optimize mobile learning, easy updates, and to facilitate forms of interaction such as comments and likes.

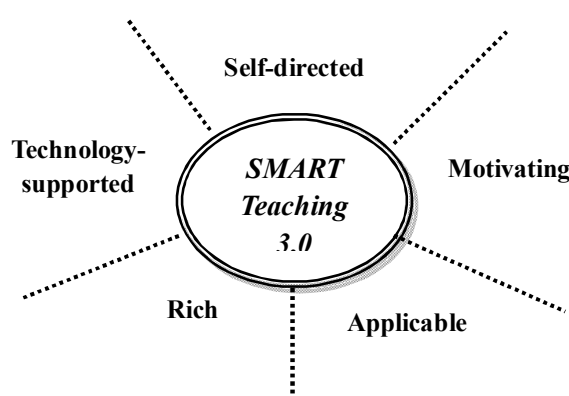


Figure 2. The Key Features of SMART Teaching 3.0

Procedures

The teachers who registered for the program were provided with a six-minute-long orientation video on *SMART Teaching 3.0*. The video introduced the key features of the program, content, and various ways of searching the contents. However, it did not impose any fixed curriculum on the participants, enabling them to use the program at their convenience and according to their own needs. Efforts were made to encourage the participants to use the program in a cycle of learning, applying, and reflecting. Specifically, in order to facilitate application and reflection, the participants were asked to write comments on the video postings, and submit weekly journals to the program manager via SNS. They were provided with coffee coupons as an incentive to submit weekly journals.

Immediately after the orientation, the participants were free to use *SMART Teaching 3.0*. No intervention was made except for the program manager's occasional reminders encouraging comments and weekly journals.

Data Collection and Analysis

Throughout the implementation, various forms of quantitative and qualitative data were collected, which revealed different aspects of the program. First, the website statistics data were collected for five months from March to July, which revealed use patterns such as the number of visits, the number of page views, access devices, and time of visits.

Second, the participants' comments on the video postings and weekly journals were filed for content analysis.

A total of 85 comments and 78 weekly journals were available. Since comments were written for each online posting, they were more content-specific and relatively short. On the other hand, weekly journals provided more structured and broader views on the learning process and the program. Put together, they provided rich information on the participants' use and perception of the program, such as content preference, perceived benefits, intentions or attempts to apply, reflections on their own classes, positive and negative evaluation, and additional teaching ideas.

Finally, in-depth interviews were conducted with five participants in August to seek their overall evaluation of the program and suggestions for improvement. Interviewees were selected considering their degree of participation, teaching experience, and school levels. Semi-structured, Korean-language interviews were carried out over the phone for about 30 minutes for each selected participant. All the interviews were recorded and transcribed for analysis.

Data were analyzed in terms of whether and to what degree the five key features of *SMART Teaching 3.0* were realized during implementation. In the following section, results are presented in relation to each feature.

Results

Self-Directed Use of *SMART Teaching 3.0*

Unlike previous teacher training programs which impose a predetermined curriculum and requirements, *SMART Teaching 3.0* was developed as a self-directed learning program. The evidence that *SMART Teaching 3.0* elicited self-directed learning is threefold. First, a total of 149 teachers voluntarily joined the program in the absence of any external incentives. They chose the program based solely on their internal motivation to improve their professional skills. This number is quite impressive given that the recruitment efforts were made only through an SNS chat room for a short period.

The second piece of evidence for self-directed use of the program can be found in the participants' repeated visits to the program. Table 3 presents the visit records drawn from the website statistics.

TABLE 3
Frequency of Visits: Website Statistics

	March	April	May	June	July
Number of Visits	158	166	474	165	61
% of New Visits	53	55	39	42	61
% of Repeated Visits	47	45	61	58	39
Number of Page Views	735	789	2633	753	261

The participants visited the website most frequently in May and least frequently in July. The soaring number of visits in May can be attributed to the newly recruited teachers in late April. They, in addition to the first cohort of participants, began to visit the website in May. It is also possible that teachers could afford the time to study for themselves in May after the hustle and bustle of the beginning of a new semester in March and April. This is manifested in the increased percentage of repeat visits in May and June. This means that more participants revisited the website in these two months, indicating that they were not mere onlookers but began to use the program for learning. It should be noted, however, that the number of visits dropped sharply in July.

The participants' active participation in various forms is the other evidence for self-directed use of the program. At the end of April, the first cohort of teachers and the newly recruited teachers were asked to make

their own study plan for *SMART Teaching 3.0*. From the total of 149 teachers, 63 submitted a study plan. Writing comments on video postings⁴ was another way to participate in the program. Thirty-six teachers wrote 85 comments. One teacher even wrote 15 comments for no compensation. When asked about the motivation to continue to participate in the program, one interviewee mentioned, along with other factors, the feature of self-directed learning.

- (1) *When I take other institution-based training programs, I feel a sort of pressure to complete the programs. However, in this program, I do not have such pressure. Moreover, I can stop and resume studying the content without any time constraints. More importantly, the contents are really rich and helpful. This is why I have participated diligently.* (from an interview with K1 teacher, August 16, 2016)

Put together, the participants voluntarily joined the program, repeatedly visited the website, and actively participated in the program. These factors demonstrate that *SMART Teaching 3.0* served as a medium for self-directed learning.

Motivating Content of *SMART Teaching 3.0*

SMART Teaching 3.0, adopting a bottom-up approach, was developed based on a needs analysis with English teachers. Furthermore, to facilitate teachers' motivation, various types of content were provided such as real classroom teaching samples, panel discussions, interviews, TED-type storytelling, and lectures. In order to investigate how this content was perceived and used by the participants, their comments and weekly journals were analyzed in terms of their choice of content. The results are presented in Table 4.

TABLE 4
Choice of Content: Comments and Weekly Journals

	Virtual class tour			Screen lecture		Tips & Issues		Teachers' stories	
	C	WJ		C	WJ	C	WJ	C	WJ
Reading	20	34	ICT	1	6				
Vocabulary	9	17	Reading	1	12				
Level-differentiated teaching	14	5	Lesson planning	0	3				
Grammar	6	11	Testing	4	12				
Questioning	5	5							
Group work	2	9							
ICT	10	11							
Total	66	92		6	33	4	19	9	29

Notes. 1. C: comments on video postings, WJ: weekly journals

2. Multiple responses were allowed in WJ.

The most popular section was *Virtual class tour*. The teachers noted in comments and weekly journals that they appreciated this section because they could observe and learn from many good teachers' excellent teaching practices. Among the various videos in this section, teaching reading received the greatest interest from the participants. This is in line with the results of the needs analysis that many teachers considered reading the most challenging area to teach. In Korea, reading skills play a crucial role in the SAT and yet many teachers are not

⁴ Weekly journals were not considered as evidence of self-directed learning because the participants were provided with coffee coupons whenever they submitted their weekly journals.

familiar with alternatives to grammar translation methods in teaching reading. This explains why English teachers in this study showed a strong need for content relating to the teaching of reading. Based on the findings from the needs analysis, *SMART Teaching 3.0* provided a lot of useful content on teaching reading, which may account for the highest use of this content. Teaching vocabulary and teaching ICT were also frequently chosen by the teachers.

Screen lecture was the second most frequently studied section. In particular, the teachers showed a high level of interest in testing and reading. Again, this corresponds to the results of the needs analysis that showed English teachers are in need of help on writing adequate test items, delivering valid performance assessment, and teaching reading in a meaningful way. *Screen lecture* met their needs in these areas. In addition, another factor that may have contributed to the popularity of this section was the fact that teachers provided all the lectures including their own teaching experiences and materials.

The teachers also strongly appreciated *Teachers' stories*. In this section, four teachers shared their own experiences as first year teachers as well as ways to overcome difficulties. The participants noted that they took a lot of comfort and courage from their peer teachers' stories because they realized that they are not the only ones that have to struggle to survive in the classroom.

- (2) *Everything is new and difficult for me as a novice teacher... I felt empathy with K teacher's story, which gave me a lot of comfort.* (from comments, April 3, 2016)
- (3) *Thanks a lot. I'm relieved to know that the difficulty I experience now is part of a natural process.* (from comments, March 7, 2016)

They also liked two students' stories about their unforgettable English teachers. They stated that while watching their stories, they came to reflect upon their role and attitude as a teacher from a student's perspective.

- (4) *The student's story was the most impressive in this program... To reflect on the past two months, I seem to have lost my mind, finding excuses in my busy schedule and many duties. I know teachers' philosophy and view on the world strongly affect students.* (from comments, May 31, 2016)

The *Tips & Issues* section was relatively less explored by the participants. This section consists of three videos, two panel discussions and a collection of interviews with teachers. Probably, the format of a panel discussion was perceived as formal and unfamiliar to many teachers. Furthermore, their running times, up to 25 minutes, were relatively long.

Applicability of *SMART Teaching 3.0* to English Classes

The data analysis reveals that the content of *SMART Teaching 3.0* is applicable to the participants' English classes. First of all, according to the analysis of 78 weekly journals, about 50% of them reported they had applied ideas gained from the program into their actual instruction, as illustrated in Figure 3.

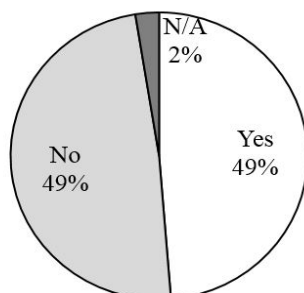


Figure 3. Experience of Applying Learning to Teaching: Weekly Journals

Their application of new ideas from *SMART Teaching 3.0* to the classroom was also well perceived by their students, as shown in the following excerpts.

- (5) *I applied what I learned from the reading lesson videos to my class. My students loved it ☺* (from weekly journal, April, 25, 2016)
- (6) *It was good to learn ICT tools and the utilization tips. Particularly, Quizlet was useful to create word cards and vocabulary tests.* (from weekly journal, June, 5, 2016)

Second, comments on the video postings show that the participants had specific plans to implement their learning into new activities or to change existing activities with the newly learned methods.

- (7) *It is really difficult to motivate students in low-level classes. But I think they will summarize a class lesson more easily if they are asked to create a storyboard just like comics which are familiar to them.* (from comments, May 10, 2016)
- (8) *I usually complete my reading lesson with line-by-line translation after meaning-based reading, but probably, this jigsaw idea can be a good alternative.* (from comments, May 14, 2016)

Third, they felt that the video contents were helpful and useful for their instruction in the future although they had not yet utilized the ideas. Some participants mentioned a specific method or reasons for selection of the videos.

- (9) *I had many questions on how to teach the reading part. I got a lot of help from it!* (from weekly journal, March, 26, 2016)
- (10) *Providing fill-in-the-blanks seems to be a good start for self-directed learning.* (from weekly journal, May 23, 2016)

Overall, the contents that consisted of small instruction tasks identified by needs analysis seemed practical and also applicable to the English teachers. They looked for things to implement in their classes and actually applied the new ideas in their lessons, or they planned to implement methods.

Richness of the Content

As previously mentioned, 42 video files were uploaded for the implementation of *SMART Teaching 3.0* and their total running time was 541 minutes. A total of 31 participants (29 teachers and 2 students) contributed to the content development. When compared with two programs offered for novice English teachers in Seoul (2014 - 2016), the contents of *SMART Teaching 3.0* are richer and more varied in terms of both quality and quantity, as shown in Table 5.

TABLE 5
Comparison of SMART Teaching 3.0 with the Current Programs for Novice English Teachers in Seoul (2014 - 2016)

Title	<i>SMART Teaching 3.0</i>	Newly-Employed Teacher Education Program	Assessment Workshop
Length	541 minutes	200 minutes	200 minutes lecture & 11 hours practice
N of instructors	31	2	3
Content Type	42 online videos of four types	offline lecture & demo teaching	offline lecture & practice
Topics	reading, vocabulary, grammar, assessment , lesson planning, ICT, etc.	administration, classroom management, etc.	creating & revising testing items

However, the richness of the content can be evaluated differently depending on the identity of the users and for what purposes the contents are used. According to the analysis of the weekly journals, many participants in this study showed satisfaction with the rich content of the program by repeatedly using the keywords, ‘various’ and ‘practical.’ At the same time, however, the data analysis reveals that *SMART Teaching 3.0* needs more content and resources in the future. Some teachers wanted updates of the content or requested some other topics or skills, as manifested in the following excerpts from the weekly journals.

- (11) *In Virtual Class Tour, only reading skills were highlighted. It would be great if I could find some contents for teaching speaking and writing skills.* (from weekly journals, May 14, 2016)
- (12) *The context of many sample teachings seemed to be classes for female students. I wonder if this will work with male students with low motivation.* (from weekly journals, May 16, 2016)
- (13) *I want more movies for speaking and listening instruction. Worksheets and handouts are also needed.* (from weekly journals, May 16, 2016)
- (14) *Is there any plan for updating? Thank you.* (from weekly journals, June, 12, 2016)

Since easy updates are one of the strengths of the platform used in this study, more content can be easily added on a continuous basis through further needs analysis and user requests.

Technology-Supported Learning in *SMART Teaching 3.0*

SMART Teaching 3.0 was designed to be easy for participants to access and study anytime, anywhere by using mobile devices. The results show that this feature was well utilized by the participants in this study. First of all, it was found that the participants accessed the program in their spare time at work or at home. Figure 4 illustrates the time of day when the participants visited the website from March to July.



Figure 4. Times of Website Visits: Website Statistics

The participants visited the website most frequently at 10 AM, which was followed by 3 P.M and then 11 A.M. These hours are when the teachers are working at school. This indicates that professional development took place during work hours as part of their daily activities using their spare time. This was further confirmed by the interviews conducted at the end of the program. Four teachers out of five responded that they had visited *SMART Teaching 3.0* at school when they had time between classes. The hours after work, around 8 P.M and 10 P.M., were also favored by the participants.

Second, the participants also chose where they would study, as shown in Table 6.

TABLE 6

Physical Location of Program Visits: Weekly Journal (multiple responses)

Place	Participants (%)
at home	40 (49)
at school	32 (40)
while commuting	7 (9)
at a cafe	2 (2)

An analysis of the weekly journals shows that the mobile-based program expanded the venue of teacher development to various places. About half of the participants used the program at home, and 40% at school. It is also interesting that 9% of the participants used the program during their commutes and 2% even used it at a café. This finding is also correlates with that of access time mentioned in Figure 4. The participants' weekly journals also supported this finding.

(15) *It was really nice to be able to access the program via smart phones and thereby to study anywhere in my spare time.* (from weekly journals, May 16, 2016)

For anytime, anywhere access, the participants used *SMART Teaching 3.0* both in PC and mobile mode. Figure 5 illustrates the percentage of PC users and mobile users based on the website statistics.

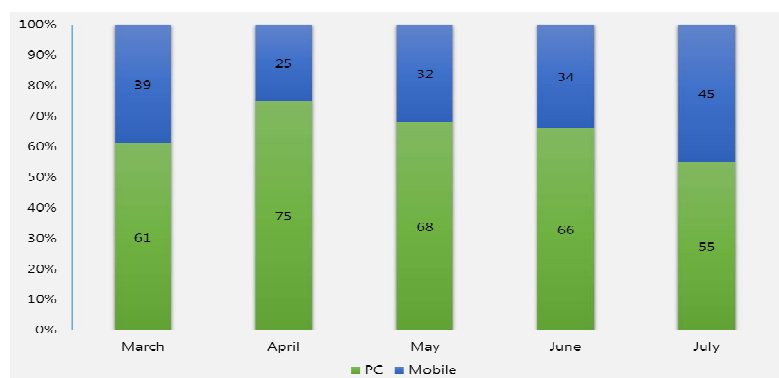


Figure 5. Devices Used to Visit the Program: PC vs. Mobile Devices

On average, 65% of the participants used PCs and 35% used mobile devices such as smart phones and tablets. Although there were more PC users, the high percentage of mobile device users is quite encouraging. The percentage of mobile users even increased to 45% in July. Given that about 90% of the teachers who submitted weekly journals had visited the program either at home or at school, it is possible that some teachers even chose to use mobile devices indoors. These results indicate the great potential of mobile-based teacher education programs.

Discussion and Conclusion

The primary purpose of this study was to develop and validate a bottom-up teacher development program through implementation. Based on the literature review, this study proposed *SMART Teaching 3.0*, which is a self-directed, motivating, applicable, rich, and technology-supported teacher development program. The program was implemented with 149 in-service English teachers for five months, during which time various sources of data were collected to verify whether the key features of *SMART Teaching 3.0* had been realized as intended.

First, *SMART Teaching 3.0* was successful in facilitating teachers' self-directed learning. A total of 149 teachers voluntarily joined the program without any requirements or incentives. In addition, many of them made repeated visits to the website and actively participated in the program by making study plans and writing comments on the video postings. It should be noted, however, that their voluntary participation declined as time went by, raising the issue of the sustainability of self-directed learning.

Second, the contents of *SMART Teaching 3.0* were perceived to be motivating but to different degrees across types. The most preferred section was *Virtual class tour* which provided access to expert teachers' genuine English classes and various teaching tasks. *Screen lecture* was also popular among the participants. It is noteworthy that the providers of these two sections were English teachers themselves. It is well reported in the literature that teacher trainees consider learning from peer teachers more helpful and constructive (Oh, 2010). This was also confirmed by the needs analysis conducted for this study. Another factor which made the contents of *SMART Teaching 3.0* interesting was its bottom-up approach to developing a curriculum. The contents of the program were selected based on the needs analysis and thereby met the participants' wants and needs. The popularity of *Teachers' stories* is also worth mentioning. Many teachers expressed that they had taken comfort and courage from peer teachers' and students' stories about their experiences. This indicates that teacher development programs should deal with not only cognitive aspects but also affective factors such as empathy, emotional support, and fellowship. The *Tips & Issues* section was least explored by the participants, probably

because of the heavy topics, formal format, and relatively long running time. This indicates a need for revision of the section.

Third, the contents of *SMART Teaching 3.0* were not only studied but also applied to actual classroom teaching. According to the comments and weekly journals, the teachers either applied or planned to apply new ideas they had learned from the program in their own classes. They also reflected on their application and shared further ideas via online comments.

Fourth, *SMART Teaching 3.0* provided richer content than the current novice teacher training programs in terms of length, the number of instructors, and content topics and types. Even so, the participants requested more varied and updated content on a wider range of topics.

Fifth, the technology-supported design of *SMART Teaching 3.0* expanded the time and place of teacher development to a great extent. Many teachers explored *SMART Teaching 3.0* at school in their spare time between classes or at home after work. In this way, teacher professional development was integrated naturally into their daily lives. Also, by using mobile devices, they could visit the website even during their commutes or at cafés. This shows that mobile-based programs can make teacher education more accessible and thereby more manageable.

Overall, the implementation of *SMART Teaching 3.0* confirmed that the five key features of the program were well perceived and realized. Yet, it also revealed several issues and problems to be solved in order for *SMART Teaching 3.0* to be launched as a full-fledged program and be disseminated to a wider population. First of all, its contents need to be updated and expanded to meet the needs and requests of teachers. On a technical level, this can be done without much difficulty because the platform of *SMART Teaching 3.0* allows for easy updates and addition of content. Furthermore, teachers themselves can be content providers, using Web 2.0 technology. If this is successfully adopted by any institutes or teaching communities, the program will continue to grow with customized content.

A more serious and critical issue is how to sustain self-directed learning for long periods. *SMART Teaching 3.0* was successful in eliciting teachers' voluntary initiation of self-directed learning but it did not last long. The participants attributed it to several factors such as their busy schedules, consumption of the content over time, or incompatibility of the content with their school environments. These problems can be solved by continuously providing more diverse content. However, even with such changes, it is teachers' internal motivation to continue engaging in professional development that will ultimately determine their participation in the program over time. Thus, it is necessary to find ways to enhance and maintain teachers' internal motivation. Especially noteworthy in this regard are the participants' suggestions of more active interaction with the trainer teachers and the other participants both online and offline. In *SMART Teaching 3.0*, the teachers' interaction was engaged only in a limited way through comments on the video postings. Sometimes, they asked questions or shared their ideas in terms of application and reflection, but they rarely received answers or comments. Overall, their self-directed learning remained an isolated, individual process.

Lave and Wenger (1991) claim that learning takes place when a learner, as a member of a community of practice (CoP), participates in practice. A CoP is a group of people who share a profession or a concern. The concept of the CoP has drawn a lot of interest in the field of professional development, but it is only recently that it has been applied to teacher education (Lee, 2010; Paek, 2015). As in other professions, teachers can learn better when they, as members of a community, collaborate with each other, seek better ways to perform, and put the ideas into practice. CoPs can exist in various modes such as virtual, mobile, or physical settings. *SMART Teaching 3.0* formed an online CoP, which was not strong enough to give the participants the sense of belonging to the community and lead to practice with collective learning. Thus, it needs to be supplemented with stronger types of CoP, which may enhance teachers' feelings of connectedness and thereby drive them to continue professional development.

This study suggests school-based, offline CoPs. Teachers may form a CoP within their school. *SMART Teaching 3.0* can be a starting point as well as a common ground for such school-based CoPs. After teachers

individually study using *SMART Teaching 3.0*, they can meet together and exchange their ideas on how to utilize their learning from the program in their English classes. After application, they can gather again to share and reflect on the results. When *SMART Teaching 3.0* is combined with school-based CoPs in this way, it will be able to facilitate self-directed, teacher-centered professional development for a longer time. This is also in line with the current teacher training policy of the government, which emphasizes school-based consulting and collaboration. The role of school-based CoPs in implementing *SMART Teaching 3.0* needs to be further explored in future studies.

Despite its significant findings and suggestions, this study has several limitations. Given the limited number and composition of the participants in this study, the present study can be considered as a pilot implementation of the suggested teacher development model and program. More studies with a wider range of population are needed for the generalizability and external validity of the findings. Also, this study conducted only a preliminary analysis of the plethora of qualitative data collected throughout the implementation. Further in-depth analysis of comments on online postings, weekly journals, and interviews waits to be done.

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