The Birth of Smart Teacher: A Genealogical Examination of the Newest Teacher Subjectivity on the Matter of Technology Use

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Abstract
This study employs Foucauldian concept of "genealogy" to explore rules, norms and knowledge of popular educational discourses about 'SMART education' in South Korean contexts. This research is significant on the point that it shows the formation of a specific teacher subjectivity at this specific historical juncture which might be rather limited in relation to issues of technology use in teacher education. The authors investigate SMART education discourses by collecting public documents (e.g., national policies, research reports, news articles), and by generating relevant documents (e.g., interview) in combination with analytical tools provided by Fairclough (2003). With the collected textual data and the tools, this paper uses four-part Foucauldian framework to illustrate the constructed teacher subject: 1) What aspects of teachers needed to change (substance), 2) For what reason should this change happen (mode), 3) What are teachers supposed to do to change themselves (the regimen), 4) What a model or perfect version of teacher might look like (telos). The writers argue that 'smart teacher' is positioned as 'updatable software' which is to be thoroughly, constantly, ubiquitously and autonomously updatable. Ultimately, this research aims to open up our discussions regarding different possibilities by re-imagining future versions of education and teachers.

Keywords: SMART Education, Technology Integration, Education Reform Subjectivity, Discourse Analysis, Genealogy, Foucault, South Korea

1. **Introduction**

With the rapid development of digital technology, the position that technology takes in education seems to be getting more important. (see e.g. Azumuddin et al., 2020; Dincer, 2020). It might be the positive effects that the importance of technology integration is significantly growing. Indeed, technology adotion in education often promises better learners' autonomy, digital competence as well as more satisfactory learning experiences (see. e.g. Lenkaitis et al., 2020; Njuguna, 2020). Like an epidemic, many governments have implemented technology driven education reform projects in order to innovate their education since early 2000s (see Lee & Lee, 2019, p.1902). Accordingly, teachers' effective technology integration has been highlighted and studied vigorously. There is large number of studies investigating teachers' relevant competence or modelling teachers' technology adoption (see e.g. Tondeur et al., 2018; Tømte et al., 2015; Scherer et al., 2017; Scherer et al., 2018). However, there is a lack of understanding as to a certain question: How would a good teacher look like in this era of technology? If those particular interests and educational reforms not only change what teachers do but also change who they are, just as Stephen Ball (2003) states, it needs to be elucidated to critically reflect what kind of teachers we are building in the society.

Taking the question as the main research question, this study takes on a critical analysis on a set of statements prioritising technology integration in education (i.e. critical discourse analysis) in order to find out a certain formation of teacher subjects. To make the project manageable, this research focus on SMART education discourses, discourses about a technology driven education reform project in South Korea. In the following paragraphs, this study closely read various texts supporting SMART education while questioning the following points which draw on Foucault's genealogical examination (Clarke, 2009; Fendler, 2010):

How smart teacher is constructed in SMART education discourses?
1) What aspects of teachers needed to change?
2) For what reason should this change happen?
3) What are teachers supposed to do to change themselves?
4) What a model or perfect version of teacher might look like?

Ultimately, we argue that current formation of teacher subjects might limit the possibility for us to dream about different futures.

2. A gap in the current literature on teacher subjects in relation to technology use

This study focuses on 1) professional competence of teachers 2) teachers' practices and perceptions 3) teacher identity. By exploring how the current literature understands each area, this study can argue that there is a lack of knowledge which enables us to see the formation of teacher subjects at this historical juncture.

There are many studies investigating professional competence of teachers in relation to their technology use. It can be called as 'digital competence', 'ICT competence', 'Technological Pedagogical Content Knowledge (TPACK)' and so on. While it is called with various names, it tends to indicate a set of skills, knowledge and attitude that are necessary in using technology as a teacher (see Røkenes & Krumsvik, 2014;

Tømte et al., 2015; Tondeur et al., 2018). As Lee and Lee (2020) point out, the trend in the body of knowledge tends to expand its theoretical boundary by constructing conceptual model (see e.g. Scherer et al., 2018) and by going through statistical procedures with a theoretical framework (see. e.g. Scherer et al., 2017). In this regard, the literature in this field is clearly being strengthened and expanded by the efforts of the researchers. However, there is a lack of research which re-consider that these research take for granted that teachers are supposed to accept technology.

Studies about teachers' practices and perceptions regarding technology integration is well documented. Mainly, researchers in this field have been discussed whether technology adoption brings any desirable effects. For instance, some researchers study software (see e.g. Wang & Tahir, 2020), hardware (see Deaney et al., 2009; Ifinedo et al., 2020; Roblin et al., 2018) or new digital pedagogies (Eichelberger & Ngo, 2020; Henderson & Philips, 2015; Seery, 2015; Starčič et al., 2016). In most of the cases, positive changes in teacher perceptions and practices are presented as the results. It cannot be denied that we must respect the scholarly contribution that have been made. However, given that the research trend encourages researchers to maximize the use of technology and to minimize the negative perceptions or practices of teachers, it might be dangerous not to question this trend not allowing teachers to feel free in utilising technology.

The literature about teacher identity in relation to technology integration understands that identities of teachers face with transition while they are dealing with technology. It has been reported that teachers' identity would be shifted from 'knowledge transmitter' to 'a facilitator' which implies that teachers' outdated identity gets updated (see Burnett 2011; Kozma & McGhee, 2003; Ottensen 2006; Loveless & Williamson, 2013). Also, some researchers focus on the contexts where teachers are situated (see Burnett, 2011; McGrail, 2006; McNaughton & Billot, 2016; Sockman & Sharma, 2008). They understand that teachers interact with the contexts and their identities would continuously be changing. It is noteworthy that, however, the critical voice also has been lacking in this body of knowledge that the contexts where teachers are situated are the aftermath of certain power relations rendering the trend receptive not innovative.

3. Methodology

Having identified some limitations in the current literature, this research takes an alternative approach to address the limitations. This approach takes Foucault's discourse position which theorises teachers as 'the effects' of certain power relations that are contingent in this specific historical time (Ball & Olmedo, 2013). Foucault's discourse position lends a conceptual tool to investigate teacher subjectivity, a specific discursive construction of teacher subjects at a certain time and space. Thus, it allows this research to elucidate the formation of teacher subjects with regard to technology use with the consideration of power relations shaping the possibility in a certain direction.

To examine teacher subjectivity, SMART education discourses have been archived. As is briefly introduced earlier, SMART education is a government reform project initiated in 2011 to innovate education system in South Korea. It is defined as the intelligent and tailored learning system for educational environment, contents, method

and assessment (MoEST, 2011). It is also stated as the driving force which innovates the educational system enhancing the 21st learner competences. The archive of SMART education discourses includes a set of statements which support the defined. The archive includes two government policy papers, three research reports published by national research institute, five news articles which support the claims about SMART education as it is defined by the government (see Table 1 below)

Issued	Title	Publisher	Format
2011.06	SMART education Implementation Strategies	MoEST	Policy paper
2011.09	SMART education Strategy Action Plan	MoEST	Policy paper
2012.12	Teaching Tips & Self Check list for the 'Good Instruction' of SMART Education	KERIS	Research Report
2013.03	Smart Education Teacher Competence and Training Programme Development for Smart Education	KERIS	Research Report
2014.02	The development and implementation of an online assessment tool for teacher competency in SMART education	KERIS	Research Report
2011.06	In a classroom at a primary school in South Korea in 2015…	The Chosun Ilbo	News article
2011.11	Preview 'digital classroom', Changwon O-chang primary school	The Chosun Ilbo	News article
2012.11	I'm a smart teacher…I teach by NIE method with Tablet PC	The Chosun Ilbo	News article
2012.12	Backpack is light, lesson is more delightful	The Chosun Ilbo	News article
2013.03	SMART education is rushing into…This is how to do 'Mum-made education'	The Chosun Ilbo	News article

Table 1: The archive of SMART education discourses

It is noteworthy that 18 interviews were conducted by the first author in, so called, a smart city in South Korea. The participants were ten teachers, five teacher educators, two school managers and a regional SMART education supervisor of the city. Interview transcripts are also added as a type of textual data in the archive (see Table 2 below).

No	Pseudo Name	Working Place	Role	Length of Teaching	Gender	Note
1	Hannah	School A	Teacher	4 years	Female	She used to teach in the other part of the city which was not involved in SMART education initiative.
2	Dongmin	School A	Teacher	4 years	Male	Began his teaching career

						in Sejong
3	Soyoung	School A	Teacher	5 years	Female	Began her teaching career in Sejong
4	Hoon	School A	Teacher	2 years	Male	He used to teach in another city.
5	Jiyoung	School A	Teacher Educator	20 years	Female	She has been a teacher educator in the city since 2014. She is one of the founding members of a teacher educator society which is managed by the regional supervisor.
6	Mingoo	School A	Teacher Educator	5 years	Male	Both used to work in the other cities. They have been working as a teacher educator for one year. They were encouraged to apply for the teacher educator position by Jiyoung.
7	Jaewon	School A	Teacher Educator	5 years	Male	
8	Yoonha	School A	School Manager	27 years	Female	She used to be teacher and a regional supervisor of Sejong city and has been managing her school about 5 months.
9	Hana	School B	Teacher	4 years	Female	Began her teaching career in Sejong
10	Yuna	School B	Teacher	4 years	Female	Began her teaching career in Sejong
11	Paul	School B	Teacher	6 years	Male	Began his teaching career in Sejong
12	Sangah	School B	Teacher	2 years	Female	Began her teaching career in Sejong
13	Hansol	School B	Teacher	13 years	Female	She used to work in other cities and started to teach in Sejong since the beginning of the city, 2012.
14	Jiwon	School B	Teacher	3 years	Male	Began his teaching career in Sejong
15	Chanwoo	School B	Teacher Educator	10 years	Male	He used to teach in another city. He has been a teacher educator since 2014. He is also the core member of the teacher educator society.
16	Joseph	School C	Teacher Educator	4 years	Male	He started his teaching career in Sejong city and has been a teacher

						educator about a year
17	Juwon	School D	School Manager	35 years	Male	He used to be a teacher. He also worked as a regional head supervisor of Sejong city playing important role in setting up SMART education. He has been managing his school at least more than three years.
18	Suhyun	Sejong City Education office	Regional Supervisor	** years	*	She used to be a teacher. She has been working as a regional supervisor for several years. She has been supervising SMART education for some years.

Table 2: Participants' general information

The four research questions are the four-axis of ethical formation of certain subjects. They have to do with 'substance', 'mode of subjectification', 'regimen' and 'telos'. Firstly, substance illuminates the target which needs to be change: What part of the teacher subject is supposed to be changed to fit in SMART education? Secondly, 'mode of subjectification' illuminates the reason: For what reason this change should happen? Thirdly, 'the regimen' refers to 'self-practices': What should teachers do to fit in SMART education? Lastly, 'telos' illuminates the end point, or the ultimate goal of teacher subjects: What a model or perfect version of teacher might look like? The last question combines the findings of the previous analytical questions and provides an end point of teacher subjects.

To critically read the collected texts, the following procedures are also set in combination with the research questions: 1) what is(are) included/excluded, 2) how the element(s) is(are) included, 3) what are the included doing in the text. The points of the analysis are drawn from Fairclough's (2003) where the author provides important aspects for the examination of language use in textual data.

- Social events: Which event(s) is(are) being talked?
- Genre: What types of genre is involved in the text?
- Difference: What is the orientation to 'difference' in the text?
- Intertextuality: What are the voices included? How they are included?
- Assumptions: What is(are) the assumption(s)? Is(are) it(they) existential, propositional or value assumption(s)?
- Semantic/grammatical relations between sentences and clauses: How are the relations between sentences and clauses in both semantical and grammatical sense?
- Exchanges, speech functions and grammatical mood: What are the statements doing? How are they doing?
- Discourses: What discourses are drawn upon in the text? What do they do in whole in the texts?
- Representation of social events: What elements of represented social events

are included or excluded? Which one is the most prominent?

- Styles: What styles are drawn upon in the text, what do they do in total?
- Modality: How strong is the author(s)' commitment?
- Evaluation: Is there a certain value being evaluated? How are they being evaluated?

4. Findings

Compatibility Teacher Competence for SMART education (here after TCS) can be said as the part on which teachers are inscribed to work in SMART education discourses. In fact, TCS is not just the part. It is conceptualised as 'the core' and 'the whole' of teachers. This point can be seen by looking at the definition of the term and its components.

> Here, teacher competence for SMART education is defined as "***the essential characteristic*** required to teacher who practices effective education in order to foster 21st century core competence and for the innovation of education heading towards the future education". This ***basic*** characteristic takes a quality which ***integrates knowledge, skills and attitude*** that have been conceptualised separately. … (emphasis added, KERIS, 2013, p.1)

TCS is defined as "the essential" and "the basic" characteristic of smart teacher. Further, it is the 'whole', not just the core as is seen in the expression that it "integrates knowledge, skills and attitude". As can be seen from the excerpt, the text is stated in "a high degree of abstraction and generalization based on the authority (Fairclough, 2003, p.141)" by a government research institute. It means that the written text and its contents hold the authority of dictating the truth.

Taking TCS as the whole of smart teacher further, it is worthwhile to considering the components. It consists of '13' competences and '61' performance indicators. Just by looking at the numbers of the competences and the indicators, it is assumable that it would be quite difficult to find any critical component which might make TCS somewhat lacking. However, when it is re-organised from a perspective that TCS is conceptualised based on 'compatibility', what TCS does not include can be revealed.

Domain	Competence	Definition
Fundamental competence	Creative problem-solving	The ability to analyse and identify a given problem by finding new ideas or concepts or by using various methods of thinking, and to establish and apply appropriate solutions to solve it.
	Social ability	The ability to interact effectively with others for problem solving, creating new outputs, learning, and proficiency
	Flexibility	The ability to actively embrace diversity in a diverse society and make the diversity feasible for the common good.
	Technology literacy	The ability to select and utilise various technologies for the collection, interpretation, utilisation, and

		creation and to implement ethics in ICT
	Ethics	Accuracy and integrity of actions in which objectives, values, methods, outcomes and expectations are consistently reasonably conducted
	Passion	A loving and devoted attitude in performing one's duties as a teacher
Practice competence	Understanding future education	The ability to understand the concepts of future education and smart education and apply them in the real world of education
	Contents expertise	The ability to understand the subject areas of one's responsibility, including the entire educational system, and to continuously develop expertise
	Building relationship with learners	The ability to build bond of sympathy based on positive communication with learners
	Instructional design and development	The ability to design a suitable learning environment and develop necessary materials by comprehensively considering the purpose of education, core competencies, contents, methods, and technology
	Building learning affordance	The ability to effectively organise and utilise the physical environment of the classroom, learning activities, and social relationships of the members, thereby creating meaningful learning experiences
	Evaluation and reflection	The ability to analyse learners' achievements and the performance of various educational activities and to make reasonable use of the results
	Building collaborative relationship with community	The ability to establish links with institutions, organisations, and resources outside the school to expand the teaching-learning arena and to play a role as a member of the community

Table 3: List of teacher competences for SMART education (KERIS, 2013, p.1)

The components can be divided into two groups: A group of competences to take the external changes in the society (i.e. Creative problem solving, Social ability, Flexibility, Technology literacy, Understanding Future education, Building collaborative relationship with community), and the other group of competences engaged with internalising what is taken from the changes (i.e. Ethics, Passion, Contents expertise, Building relationship with learners, Instructional design and development, Building learning affordance, Evaluation and reflection). Therefore, the components would not take 'the critical attitude' as the core or the essential of smart teacher given that the attitude would not be helpful in making one as the compatible smart teacher.

Survival Teachers are supposed to change themselves in order to 'survive'. It can be said as 'the survival of the fittest' as a teacher in the era where changes are happening constantly.

> *In fact, since it was the beginning of SMART education and my phone was the old version (i.e. not using smartphone), so…a bit…I felt a little bit that children are moving faster, and I am slower. … Not really, I*

> *was proud of them rather than I found it difficult. I thought, 'Ah! I'd better follow the trend. Since this is the stream of this era, it shouldn't be the case that I stay still and fell behind.' I think I was like that (Hansol).*
>
> *Well, you hear about things randomly. To be honest, recently, in our school, well, in Jiyoung's (a teacher educator) classroom, I read a news article and heard about her lesson which connected to the vice CEO of Microsoft via screen… I think I was motivated by such things. I mean…I thought there are people doing their jobs with passion and I can't just stay here. I mean…I think I was motivated by myself while seeing such things. (Hoon)*

Teachers are well aware of their surrounding environment and their missions. They have no choice but to work on themselves not to be left behind by their pupils as well as their colleagues. In the excerpt above, both teachers recognise that pupils are moving faster and observes that a colleague shows a wonderful open class which is even reported in a news article. Hansol and Hoon, both teachers state that they need to move or do something (i.e. It shouldn't be the case that I stay still and fall behind; I can't just stay here). There is not so much choices left for them.

Survival can mean 'authority' of teachers. It is because that showing professional signs to their pupils is still important even if SMART education discourses set teachers as 'a facilitator' instead of 'knowledge transmitter'. It would be the most unwelcome situation especially for a teacher who is already an established expert of the current education system and to be shown as the outdated in front of her pupil. On this point, Jiyoung (a teacher educator who has 20 years of teaching experience) talks about her fear:

> […] These days... in fact, that's what I'm most afraid of. I ***break out in a sweat*** when I stand in front of my kids with what I'm ***not skilful at***. When such time comes, it's really… every second and every minute...wah...I really ***want to sink through the floor*** […] (emphasis added)

In the excerpt, she expresses her anxiety by saying that she "breaks out in a sweat" when she comes across a certain thing at which she is not skilful. She even mentions that she "wants to sink through the floor" despite her teaching experiences and expertise in SMART education (recall that Hoon read a news article of Jiyoung). Since she wants to keep her authority, she puts efforts to develop her compatibility regardless of her current level of expertise.

Lastly, teachers are supposed to develop themselves to make sure their business can satisfy their customers. As if teachers were entrepreneurs who own their restaurants, they are positioned to change their teaching practices.

> It's the teacher's choice. ***100%***. It can't be made mandatory or compulsory. But ***one thing***, it is likely be the case in which one ***cannot help but to*** do it by ***the needs of students*** […] If children like western foods, it's the right thing to supplement nutrition in western style. If it

> is Korean food, then in Korean style. […] It is effective to do the lesson in accordance with ***the taste of customer*** […] (emphasis added, Suhyun)

As is described in the inserted text, teachers' professional choice is stated as "100%" their own. A sacred place. However, as soon as "one thing", "the needs of students" or "the taste of customer" comes in, teachers are suddenly "cannot help but to" give up their freedom and to change their professional choice. The logic is simple: If customers are not satisfied, any business would go bankrupt.

Self-authentication Teachers are supposed to prove themselves as the one who is equipped with TCS. As a means to prove themselves, they develop their professional competence by taking trainings 'ubiquitously' despite no one force them to do so. Teacher trainings take place practically everywhere: at home, at school, at institutions. Also, they can happen at any time: at night, during weekends and during vacation time. Indeed, teachers are situated in a field where it is filled with limitless training opportunities.

At the same time, teachers voluntarily take those trainings (recall that professional choices are 100% owned by teachers). However, it should be mentioned that those choices are made because they 'have no choice but to' do so in order to survive.

> In fact, by the way, using computer or cellphone makes my eyes sore and I still prefer to write with my hand instead of typing and all. I mean, I'm sort of reluctant to put smart technology in my life. (Soyoung)

> To tell you the truth, I'm not interested. […] it's not that I like SMART education particularly. […] I did SMART education as I was told to do so and children like it. But I didn't like it. (Hana)

Teachers are supposed to suffer from this discrepancy as is seen in the inserted text above. Between their personal preferences which do not go with SMART education and professional pressure, teachers 'have no choice but to' be ended up with one-sided decision in favour of SMART education.

With regard to self-authenticate, teachers also decide to perform SMART education to prove themselves as the competent in front of other people. It can mean that teachers choose to demonstrate SMART education when there is a chance to show their teaching practices to someone else.

> They think like this. "No way, it's possible to teach students just as fine without using those ICT devices." Even though they think like that, they use such things when there is an open class after all. […] They ***can't help but to notice it*** (i.e. external gaze) in an open class. To be honest, it would not be an exaggeration to say that ***all*** teachers' lessons are SMART education in an open class. (emphasis added, Yoonha)

Yoonha states that "all" teachers take SMART education as their open class instead of showing a class without using ICT devices. It is because that "they cannot help but to

notice external gaze". It is interesting to note a contrast between their ordinary class where teachers can make free professional choices and an open class where only SMART education can be heard and seen.

Lastly, teachers are encouraged to measure their TCS regularly and occasionally, for instance, after certain meaningful experiences (e.g. after an open class, before/after trainings, annually or quarterly). The measurement would lead them to the next stages. They are supposed to compare the result with other groups of teachers and themselves. Further, they are supposed to develop a certain area which is less developed than others based on the result. This set of actions (i.e. measure, compare and develop) has no end. The actions are supposed to be kept continued.

Updatable software The perfect version of smart teacher would *not* look like a human who can be inefficient, offline, or even lazy at times. Also, the smart teacher would not be able to challenge SMART education because of his personal but professional preferences. In other words, the model teacher is not allowed to be unique or different from other teachers. Plus, the constructed teacher cannot make an excuse for the lack of efforts to develop herself given that there are endless training opportunities in the society both online and offline.

The model teacher would be more like 'updatable software' which is thoroughly, constantly, ubiquitously and autonomously updatable. The constructed teacher in SMART education discourses would change everything not just his core but also his everything (i.e. thoroughly). She would develop herself without being slow, lazy or exhausted even in her 60's (i.e. constantly). The smart teacher would develop oneself anytime, anyhow (i.e. ubiquitously). The ideal teacher would perform SMART education. He would measure himself and put efforts to better himself without external pressure while demonstrating his competences even when there is no one watching over him (i.e. autonomously).

5. Concluding remarks

The analysis shows that the smart teacher is constructed by multiple discourses (e.g. natural selection discourse, traditional authority discourse, market-oriented discourse). Seemingly, they contradict each other in SMART education discourses. For instance, authority of teachers is not required in SMART education. They are supposed to be the education service providers or facilitators. Despite this, this unique relations between discourses create a specific field of possibilities for teachers; they are surrounded by colleagues who are good at SMART education, training opportunities, pupils who are faster than them in absorbing new technology, or by news articles and revised curriculum. Ultimately, the unique power relations create a reality where teachers 'cannot help but to' choose to work on themselves rendering them 'updatable software'.

It is not our intention to say that SMART education is wrong and should be abolished. It is also not the purpose of this research to conclude that the smart teacher in SMART education discourses is updatable software. Instead, it is to show our taken for granted assumptions, knowledge and surroundings are potentially shaping our future in a limited way. By elucidating teacher subjectivity constructed in SMART education discourses, we aim to open up a discussion about different possibilities for the future

education and teachers who might look different from updatable software. We acknowledge that this research is limited in some ways: First, the research context might be different in different country. The constructed subjectivity might look different depending on cultural contexts. Second, the size of data might be limited. In this regard, we suggest that future researchers collect bigger textual data and take quantitative research approach. We conclude this paper by encouraging future researchers to work on this topic further.

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