



Teachers' Professional Development and an Open Classroom Climate: A Comparative Study of Norway, Sweden, South Korea, and Taiwan

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Abstract

This article examines teachers' professional development (PD) in terms of content knowledge and teaching methods, their sense of preparedness in teaching, and their teaching practice of civic and citizenship education (CCE) in lower secondary schools in Norway, Sweden, South Korea, and Taiwan, and how these variables influence students' experience of classroom climate. We use data from the International Civic and Citizenship Education Study (ICCS 2016) initiated by the International Association for the Evaluation of Educational Achievement (IEA). ICCS 2016 data from these four places contain responses from teachers (N=7,159), and students (N=16, 089; average age =14.4 years) from 558 schools. We find that the more PD training on CCE topics and teaching methods teachers receive, the higher their sense of preparedness in teaching CCE in all four education systems. We also find that students of different cultures have different experiences about open classroom climates despite that teacher's in the four places have utilized the same teaching approaches.

Keywords: Teachers' professional development; civic and citizenship education; open classroom climate, ICCS 2016

Introduction and background

Civic and citizenship education (CCE) is critical for cultivating future generations' knowledge about democracy while engaging them in democratic life in the future. Citizenship education involves learning how to live as democratic citizens in a democratic society (Birzea, Cecchini, Harrison, Krek, Spajic-Vrkas, 2005, p24). "CCE" is an interchangeable term with citizenship education, and while it is not specifically written in the

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curriculum and literature reviewed for this study, the term CCE is used. In schools, teachers are highly influential in student learning, as “the quality of teaching is the most important factor that influences student learning” (Wang, Odell, Klecka, Spalding, & Lin, 2010, p.395). Teachers' participation in professional development (PD) is an indicator of teacher quality (Blömeke, Olsen, & Suhl, 2016) and has an impact on students' learning (OECD, 2017). Teacher PD is a lifelong process that starts with preservice training (UNESCO, 1996). “No matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all the challenges they will face throughout their careers” (OECD, 2009, p.49). “Teachers must become lifelong learners and inquisitive professionals” (OECD, 2018, p. 31).

There is a wealth of literature on teachers' PD across diverse topics. Some studies have explored how PD changed teachers' beliefs and practices (e.g., Desimone, 2009), while others researched how the length of PD influenced the depth of these changes (e.g., King & Newmann 2001). Some explored how PD influenced teachers' sense of preparedness (e.g. Kee, 2012). Some studies examined how teachers' PD affected their teaching practices (e.g., Desimone, 2009), while others have investigated the characteristics of effective PD (e.g., Abu-Tineh, & Sadiq, 2018; Darling-Hammond, Hyler, & Gardner, 2017) and suggested models of effective PD (e.g., Abu-Tineh & Sadiq, 2018; Misra, 2018). There is also literature on PD for different subjects like music (e.g., Wong & Bautista, 2018), English as a second/foreign language (e.g., Sandlund, Sundqvist, & Nyroos, 2016), and mathematics (e.g., Kaur, Leong, & Kwon, 2017; Scher & O'Reilly, 2009). While there is an abundance of research on PD in the literature, there is little research on PD in CCE, on how PD affects CCE teachers' sense of preparedness and teaching practices, and on how students experience the classroom climate. Our article aims to address the gaps by examining PD across four education systems in Norway, Sweden, Taiwan, and South Korea to determine whether and how PD influences teachers' sense of preparedness and teaching practices, and what students' experiences are of the classroom climate in CCE classrooms.

This comparative study aims to a) examine our own education system and further understand it; b) widen our perspectives by learning from other cultures and systems; c) identify PD factors in formal educational settings that foster an open classroom climate that is best for student learning in different education systems; and d) inspire better CCE policies and practices.

We chose to compare two pairs of neighboring cultural systems, which enable us to compare and contrast these two pairs of settings. It is particularly interesting in comparing these four places as we have observed similarities and differences from the literature regarding how CCE is organized in the four education systems. In Norway, CCE is integrated into several compulsory subjects such as social studies (history, geography, and civics), knowledge of Christianity, religion, philosophies of life, and ethics in lower-secondary schools (Mikkelsen, & Fjeldstad, 2013). In Sweden, CCE is also integrated into different compulsory subjects; from grades 7 to 9, it is integrated into subjects like history,

religion, and geography, while in grade 10 it is integrated into social studies, history, and religion (Lind, 2013). At the same time, CCE is a cross-curricular theme embedded in the general educational objectives in both Nordic countries. In Taiwan, CCE is a specific curriculum subject at the junior secondary level and covers seven major cross-curricular themes (Liu, Lin, & Tsai, 2013). Conversely, Korea does not officially define CCE, but there have been suggestions that CCE should be developed through public education (Kim, 2013). As such, CCE is embedded in related subjects like social studies (Cha & Mo, 2008 cited in Kim, 2013); it is also incorporated in moral education on values and attitudes (Ministry of Education, Science, and Technology, 2009 cited in Kim, 2013).

Theoretical framework, assumptions, and research questions

According to OECD (2009), teacher PD is “activities that develop an individual’s skills, knowledge, expertise and other characteristics as a teacher.”(p. 49). This definition illustrates that teacher PD is a broad term that covers different aspects of teacher learning that can be conducted formally or informally. The contents of PD can range from teaching skills, subject knowledge, to ethical values and attitudes and beyond. In this article, we use the term PD in a narrow sense. As such, teacher PD refers to formal preservice and in-service teacher education/training, with teacher education and teacher training being interchangeable. As far as the PD contents concern, we refer to teachers’ subject knowledge and teaching methods as they have covered in the ICCS 2016 questionnaires. We recognize that this has limitations. However, we do not seek to draw conclusions about the components or characteristics of effective PD; rather, we connect formal teachers’ PD with the development of an open classroom climate.

Research on preservice teacher education has suggested that teachers who have more comprehensive preparation experiences tend to feel more prepared and teach more effectively (Kee, 2012). Teachers who feel prepared have a greater sense of efficacy about whether they are able to make a difference in student learning and are more likely to believe that they can reach all of their students, handle problems in the classroom, teach all students at high levels, and make a difference in students’ lives (Darling-Hammond, Chung, & Frelow, 2002). Teachers’ sense of efficacy increases after accessing PD training, as this can help them develop additional skills and gain confidence in their teaching (Rose & Reynolds, 2006). Teachers’ sense of self-efficacy can be enhanced with their improvement of pedagogical knowledge (Wyatt, 2013) and access to positive PD experiences (the General Teaching Council for Scotland, 2012). When Allinder (1994) concluded enhanced self-efficacy was associated with teachers’ willingness to try new teaching methods, Darling-Hammond (2006) found that effective PD opportunities had significant impacts on teacher instruction quality.

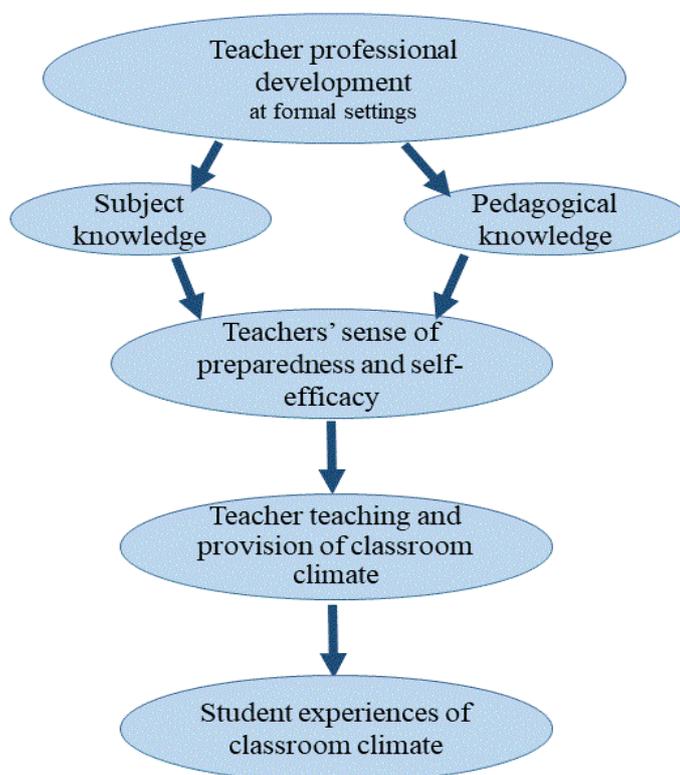
Self-efficacy is “a variable found in a number of studies to be correlated with teacher effectiveness” (Darling-Hammond, Chung, & Frelow, 2002, p.294). These findings ultimately indicate that teachers’ PD influences their sense of preparedness, sense of efficacy

in teaching and thus their teaching. The review of the literature leads us to the assumption that teachers' PD in terms of subject knowledge and teaching methods influences teachers' sense of preparedness and self-efficacy, which affect how they teach.

According to Ambrose, Bridges, DiPietro, and Lovett (2010), the classroom climate is "the intellectual, social, emotional, and physical environments in which our students learn" (p.170). In this article, we talk about the classroom climate in terms of the intellectual aspects that lead us to define an open classroom climate as "a learning environment that is focused on open discussion about political and social issues" (Ambrose et al., 2010, p.587). Research has indicated that the open classroom climate consistently contributes to positive civic outcomes (Huang & Biseth, 2016) and the development of political self-efficacy (Levy, 2011).

Building an open classroom climate can be challenging, but teachers can create such environments through daily pedagogical decisions (McCafferty-Wright & Knowles, 2016). In fact, teachers' teaching methods are strong contributing factors to creating positive classroom climates (Chapin & Eastman, 1996) (refer to Adelman and Taylor, 2002 for indicator list). In addition, Evans, Harvey, Buckley, and Yan (2009) highlight how the classroom climate is almost exclusively tied to teachers' skills. These findings have provided compelling evidence to connect teachers' PD with the development of an open classroom climate. Based on the literature, we construct our theoretical framework, as illustrated in Figure 1.

Figure 1: Theoretical framework of the assumptions of the relationships between teachers' PD and students' experience of the classroom climate



Our theoretical framework (Figure 1) intends to visualize three assumptions from previous research:

- a) Teachers' PD training is associated with teachers' sense of preparedness and self-efficacy in what and how they teach;
- b) Teachers' PD and their sense of preparedness and self-efficacy influence how they teach; and
- c) How teachers teach is related to how students experience teaching practices in the classroom.

By testing the three assumptions on the four different education systems, we aim to answer the following research questions: a) What and which factors embedded in teachers' PD could foster an open classroom climate for student learning?; and b) Are these factors similar or different across education systems and cultures?

Data and methods

We use data from the International Civic and Citizenship Education Study (ICCS 2016) initiated by the International Association for the Evaluation of Educational Achievement (IEA). ICCS 2016 data from these four places contained responses from teachers (N=7,159), and students (N=16,089; average age =14.4 years) from 558 schools. Table 1 describes the data and results from the ICCS 2016 study findings across the four places in collected through two separately administered questionnaire surveys obtained from teachers and students.

Table 1: ICCS 2016 data used in the analysis

	Norway	Sweden	South Korea	Taiwan	Total
Number of schools	148	155	106	149	558
Number of teachers	2,010	1,542	1,368	2,239	7,159
Number of students	6,271	3,264	2,601	3,953	16,089
Average age of students	14.6	14.7	14	14.1	14.4
Average student civic knowledge achievement (standard error)	564 (2.2)	579 (2.8)	551 (3.6)	581 (3.0)	517 (0.7)*

* International average (Table 2.9; Schulz et al., 2018).

Two groups of questions from the ICCS data are of interest for this study. The first group of questions ask about teachers' professional preservice and in-service training in CCE-related topics, and their feelings of preparedness in teaching those topics (Table 2). The second group of questions ask about teaching methods applied by teachers in the classroom (Table 3) and students' experiences of teachers' teaching practices in a regular classroom of CCE-related subjects.

We realize our comparison across the four systems using three data analysis steps. First, we apply descriptive analyses of teachers' PD together with their feeling of prepar-

edness and teaching methods applied in the classroom, and students' experiences of classroom climate. Second, to see if and how these factors are related, we utilize scales derived from teachers' and students' responses to questions on teacher PD training and teaching practices in the classroom, and students' experiences of teaching practices in the classroom. These scales are calculated by applying item response theory (IRT) weighted likelihood estimate (WLE) scores with an international average score of 50 and a standard deviation of 10 for equally weighted countries (Köhler, Weber, Brese, Schulz, & Carstens, 2018). Third, we perform correlational analyses to see the correlations between teacher variables and student variables. We disaggregate teachers' responses on the question asking how often they use certain teaching methods in the CCE classroom and correlate these with students' reported experiences of an open classroom climate.

Our results are presented in response to the three assumptions made at the beginning of this work, which is a) teachers' PD training is associated with teachers' sense of preparedness in what and how they teach; b) teachers' PD and sense of influence how they teach; and c) how teachers teach is related to how students experience teaching practices in the classroom.

Results

Teachers' PD training and their sense of preparedness in teaching CCE-related subjects

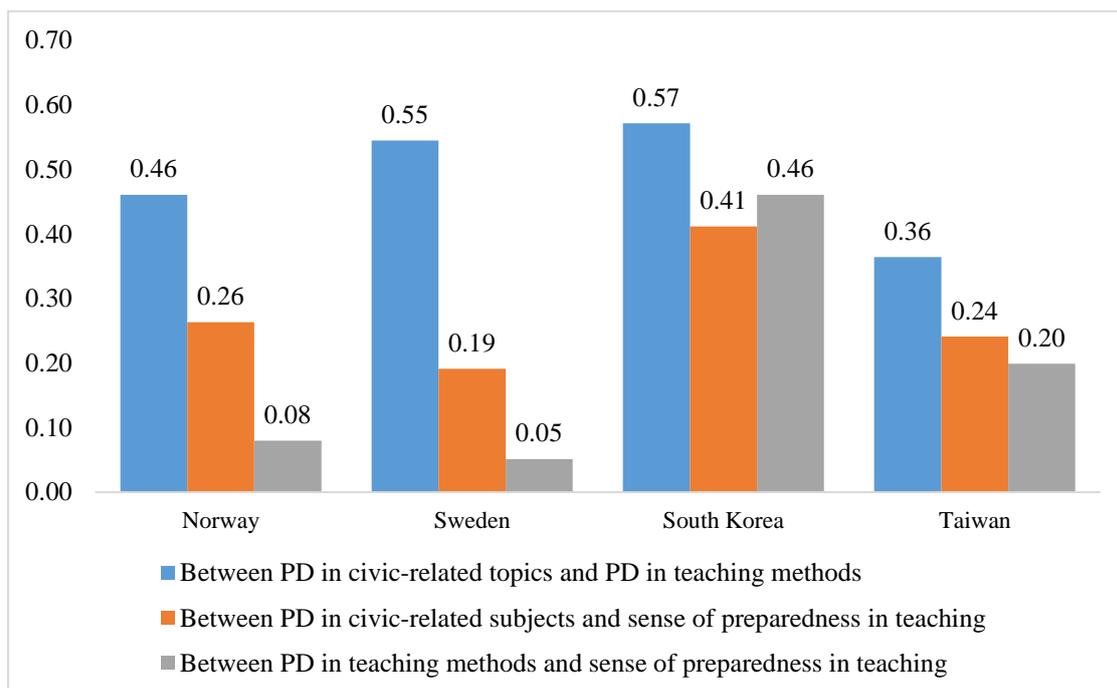
Table 2 compares teachers' self-reported feelings of preparedness to teach CCE-related topics, and whether they receive training relevant to these topics and teaching methods during their pre-service education, in-service training, or both. We find interesting results across the four systems. First, CCE-related topics and teaching methods are more likely to be addressed in preservice training than in in-service training for teachers in Norway and Sweden, while these topics are usually covered in in-service training in Taiwan and South Korea. Second, teachers in Taiwan generally receive more training when compared to teachers in the other three places, as only 21.6% of them receive no training on CCE-related topics, while two-thirds of Norwegian teachers and half of the Swedish teachers and South Korean teachers do not receive training on related topics. Third, although over half of the teachers in Norway and Sweden do not receive any training on CCE-related topics, most Norwegian and Swedish teachers feel well prepared to teach these topics. Further, half of the teachers in South Korea do not receive any training on CCE-related topics, and one third do not feel well prepared to teach these topics. Meanwhile, in Taiwan, a similar proportion of teachers who do not receive training on CCE-related topics do not feel well prepared to teach these topics. When examining the teaching methods covered in preservice and in-service training across the four education systems, teachers in Taiwan appear to be most trained in these teaching methods.

Table 2: Teachers' responses on training received during preservice (Yes pre-), in-service (Yes in-), or neither on civic- and citizenship-related topics and their feeling of preparedness in teaching these topics (percent)

<i>PD CCE Topics:</i>	Norway					Sweden					South Korea					Taiwan				
	Yes, pre-	Yes in-	Yes, pre- & in-	None	Not well prepared to teach	Yes, pre-	Yes, in-	Yes, pre- & in-	None	Not well prepared to teach	Yes, pre-	Yes in-	Yes, pre- & in-	None	Not well prepared to teach	Yes, pre-	Yes in-	Yes, pre- & in-	None	Not well prepared to teach
Human rights	28.7	3.4	5.5	62.4	5.3	35.7	2.3	11.9	50.2	2	7.2	35.7	11.1	46.0	36.5	13.8	34.2	39.2	12.9	13.9
Voting and elections	19.6	3.6	4.8	72.0	3.8	30.5	3.7	9.8	56.0	5.5	5.7	16.9	9.2	68.2	34.2	18.4	26.1	37.8	17.7	4.2
The global community and international organizations	30.1	2.3	5.8	61.8	20.2	41.2	4.2	8.2	46.4	6.3	4.1	18.6	12.2	65.0	56.8	13.4	27.5	22.0	37.0	16.5
The environment and environmental sustainability	23.8	4.4	4.0	67.8	20.2	43.9	3.6	8.5	44.0	8.3	7.6	19.8	17.4	55.3	35.3	7.8	45.0	33.7	13.6	11.6
Emigration and immigration	26.8	1.8	6.0	65.4	5.7	33.6	2.4	7.7	56.3	5	3.3	14.8	10.2	71.8	68.3	6.0	20.9	15.2	57.9	56.5
Equal opportunities for men and women	27.3	1.9	2.7	68.2	5.8	37.0	3.9	5.8	53.3	1.5	5.3	36.5	12.0	46.2	23.3	7.5	41.5	43.5	7.4	4.6
Citizens' rights and responsibilities	23.2	1.4	3.6	71.8	6.9	42.7	3.0	8.2	46.1	2.4	5.7	34.1	11.9	48.3	22.1	14.3	29.6	43.8	12.3	3.9
The constitution and political system	33.9	2.3	3.3	60.5	7.6	40.6	3.0	6.3	50.2	7.2	4.1	24.4	8.4	63.1	45.8	18.8	19.1	41.9	20.2	6.2
Responsible Internet use (e.g., privacy, source reliability, social media)	16.1	18.0	9.4	56.5	9.8	22.1	4.5	10.6	62.8	6.9	7.8	46.2	14.8	31.2	18.9	6.8	37.3	35.7	20.2	16
Critical and independent thinking	25.8	2.4	6.7	65.1	4.6	33.0	2.7	13.8	50.6	4.5	3.0	31.0	15.0	51.1	22.5	13.1	19.7	46.9	20.3	15.3
Conflict resolution	17.4	9.0	7.9	65.7	14.7	28.8	5.2	9.3	56.8	9	6.2	41.4	13.2	39.1	20	15.6	24.0	42.7	17.8	13

By summarizing teachers' responses into scales, we can explore how teachers' PD training are related to each other and to teachers' sense of preparedness in teaching CCE-related topics. Figure 2 shows the correlation coefficients between scales, which reveals that teachers' PD training on CCE topics and teaching methods are strongly correlated in all four education systems. Meanwhile, teachers' PD training on CCE topics is positively and moderately correlated with teachers' sense of preparedness on those topics in Norway ($r=0.26$), Sweden ($r=0.19$), and Taiwan ($r=0.24$); this correlation is rather strong in South Korea ($r=0.41$). Conversely, the positive correlation between teachers' PD training and their sense of preparedness in teaching CCE-related topics is very weak in Norway ($r=0.08$) and Sweden ($r=0.05$), but it is somewhat stronger in Taiwan ($r=0.24$) and strongest in South Korea ($r=0.46$). Although teachers in the four education systems receive various amounts of PD training, the positive correlation indicates that the more PD training on CCE topics and teaching methods teachers receive, the higher their sense of preparedness in teaching these subjects across all four education systems.

Figure 2: Correlation coefficients between PD in civic-related topics, PD in teaching methods, and teachers' sense of preparedness in teaching



Note: All correlation coefficients are significant at the 0.05 level; interpretation reference: $r>0.30$ (strong), $r=0.10-0.30$ (moderate), $r<0.10$ (weak)

Teaching methods used by teachers and teaching practices experienced in the classroom

Table 3 presents teachers' responses to teaching methods they often or never use in the classroom and students' responses on teaching practices they often or never experience in the classroom. Surprisingly, we find that the most and least frequently used teaching

strategies are nearly the same across all four education systems. The three most common methods are students studying textbooks, students taking notes during lectures, and students discussing current issues, while the least frequently used methods are students participating in role-plays, students proposing lesson topics, and students working on projects that require students to obtain information outside school resources. The only teaching method that shows some cultural difference between the two Nordic and the two Asian places is students working in small groups. The data show that while over half of teachers in Norway and Sweden frequently use group work in their classrooms, only one-third of Korean teachers and one-tenth of Taiwanese teachers do so.

From the students' perspectives, over half of students report that teachers "encourage students to express their opinion" in a class of CCE-related subjects in Norway, Sweden, and Taiwan, while only one-fifth of South Korean students do so. Students in all four places (15% in Norway, 22% in Sweden, 6% in South Korea, and 9% in Taiwan) are least likely to report that they could "bring up current political events for discussion in class". Using items that measure students' perspectives of teaching practices in the classroom (listed in Table 3), the ICCS database has "an open classroom climate" scale with an international mean of 50 and a standardized deviation of 10 (higher values indicate a better "open classroom climate"). As shown in the last row of Table 3, students in Norway, Sweden, and Taiwan share similar experiences of open classroom climates (all above the international average), while students in South Korea have significantly lower ratings for open classroom climates.

Correlations between teachers' PD training, their sense of preparedness, and their teaching practices, and students' experiences of an open classroom climate

Table 4 presents the correlation coefficients between teachers' PD training on CCE topics and teaching methods, their sense of preparedness in teaching CCE subjects, and often-used teaching practices in the classroom.

Table 3: Teachers' responses to teaching methods used in the classroom and students' experiences of teaching practices in the classroom (percent)

	Norway			Sweden			South Korea			Taiwan		
	Never	Some	Often									
Teachers' teaching methods in the classroom:												
Students work on projects that involve gathering information outside school (e.g., interviews in the neighborhood, small-scale surveys).	17.2	72.4	10.5	28.8	65.2	6.0	30.1	58.1	11.8	56.1	40.3	3.6
Students work in small groups on different topics/issues.	0.0	40.8	59.2	4.1	38.5	57.4	15.5	53.9	30.6	24.9	64.4	10.7
Students participate in role-plays.	29.4	65.9	4.7	29.2	62.5	8.3	31.2	57.2	11.6	33.8	55.1	11.1
Students take notes during teachers' lectures.	1.5	37.2	61.3	2.8	37.6	59.6	9.4	44.5	46.1	0.1	13.5	86.3
Students discuss current issues.	2.2	37.6	60.2		10.6	89.4	6.6	57.9	35.5	1.8	35.9	62.3
Students research and/or analyze information gathered from multiple Web sources (e.g., wikis, online newspapers).	2.9	62.6	34.5	1.6	51.8	46.6	16.8	52.0	31.2	30.8	51.3	17.9
Students study textbooks.	0.6	24.4	74.9	2.7	35.1	62.3	2.1	18.9	79.0	1.6	14.5	83.9
Students propose topics/issues for the following lessons.	24.5	70.7	4.8	7.4	75.8	16.9	23.3	47.2	29.5	34.7	49.6	15.7
Students' reportedly experienced teaching practices in the classroom:												
Teachers encourage students to make up their own minds.	5.1	53.7	41.2	4.7	47.2	48.1	16.2	68.2	15.6	5.8	60.5	33.7
Teachers encourage students to express their opinions.	4.4	41.8	53.9	4.6	40.3	55	14.1	64	21.9	4.3	43.4	52.3
Students bring up current political events for discussion in class.	10.6	74.4	15	7.1	70.7	22.2	39.9	53.9	6.2	13.5	77.3	9.1
Students express opinions in class, even when their opinions differ from most of the other students.	4.5	64.3	31.2	4.9	62.5	32.6	22.3	66.1	11.6	7.8	56.1	36.1
Teachers encourage students to discuss issues with people having different opinions.	9.4	64.7	25.9	10.4	66.8	22.8	33.8	57.1	9.1	8.0	58.6	33.4
Teachers present several sides of the issues when explaining them in class.	6.4	59.7	33.9	8.7	67.5	23.8	23.6	63.9	12.5	6.0	54.2	39.8
<i>Mean (std.) scale of students' perceptions of an open classroom climate</i>	<i>52.6 (10.6)</i>			<i>52.3 (10.6)</i>			<i>41.3 (12.9)</i>			<i>52.0 (11.0)</i>		

Table 4: Correlations between teachers' PD training, their sense of preparedness for teaching, and their teaching practices

	Norway			Sweden			South Korea			Taiwan		
	PD training for CCE topics	PD training for teaching methods	Preparedness for teaching	PD training for CCE topics	PD training for teaching methods	Preparedness for teaching	PD training for CCE topics	PD training for teaching methods	Preparedness for teaching	PD training for CCE topics	PD training for teaching methods	Preparedness for teaching
Students work on projects that involve gathering information outside school	-0.02	0.05	-0.03	0.06	-0.10	0.01	0.28*	0.22*	0.13	0.16	0.07	0.06
Students work in small groups on different topics/issues.	0.14*	0.11	0.12	-0.05	-0.18*	0.06	0.17	0.26*	0.21*	0.19*	0.15	0.20
Students participate in role-plays.	0.09	0.01	0.16*	0.00	-0.04	0.03	0.12	0.20*	0.23*	0.20*	0.07	0.19
Students take notes during teachers' lectures.	0.08	0.16*	0.03	0.11	0.12	0.32*	0.06	0.06	0.17*	-0.02	-0.01	-0.09
Students discuss current issues.	0.09	0.15	0.15*	0.10	0.01	0.25*	0.11	0.12*	0.26*	0.01	0.02	0.19*
Students research and/or analyze information gathered from multiple Web sources (e.g., wikis, online newspapers).	0.07	0.02	0.27*	0.12	-0.02	0.12	0.21*	0.17*	0.22*	0.19*	0.14	0.23*
Students study textbooks.	0.10	0.12*	0.03	-0.10	0.16	-0.02	-0.07	-0.03	0.18	0.11	0.05	-0.06
Students propose topics/issues for the following lessons.	0.08	0.04	0.06	0.06	-0.01	0.07	0.32*	0.23*	0.22*	0.28*	0.10	0.14
<i>Scale of students' perceptions of an open classroom climate (student weight)</i>	-0.03	0.00	0.06	-0.01	-0.01	0.07*	-0.02	0.03	-0.03	0.02	0.02	0.04

* $P < 0.05$.

In Norway, teachers' PD training on CCE topics is only positively correlated with asking students to work on projects that involve gathering information outside of school, while teachers' PD training is positively related to asking students to take notes and study textbooks in the classroom. Further, Norwegian teachers who feel well-prepared to teach tend to use role play, student discussions, and student research in the classroom. In Sweden, teachers' PD training on CCE topics appears to have no significant correlation with any teaching practices in the classroom. It seems that teachers who have more PD training on teaching methods tend not to ask students to work in small groups in the classroom. However, Swedish teachers who feel well prepared to teach tend to ask students to take notes and hold discussions in the classroom.

In South Korea, teachers' PD training on CCE topics is positively correlated with using methods such as asking students to work on projects, asking students to engage in research, and asking students to propose lesson topics, while teachers' PD training in teaching methods is positively related to nearly all classroom-based teaching practices, with the exception of asking students to take notes and study textbooks. The same holds true for teachers feeling prepared to teach, which is positively correlated with all teaching practices in the classroom, except asking students to work on projects where they gather information outside of school, as well as asking students to study their textbooks. In Taiwan, teachers' PD training on CCE topics correlates positively with asking students to work in small groups, role play, and research and propose lesson topics, but there is no significant correlation between teachers' PD and the use of teaching methods overall. Teachers in Taiwan who feel well prepared to teach often promote student discussions and research in the classroom.

Moreover, we do not find any correlations between teachers' PD training and students' perception of an open classroom climate, although there is one significant but weak, positive correlation between teachers' sense of preparedness and students' perceptions of an open classroom climate in Sweden (Table 4). Nevertheless, we find some significant and rather strong correlations between teachers' frequent use of some teaching methods in the classroom and students' perceptions of an open classroom. Table 5 shows the correlation coefficients between students' perceptions of an open classroom and teachers' use of different teaching strategies in the classroom. Only a few teaching strategies applied by teachers in the classroom are correlated to students' experience of an open classroom climate. First, in all four education systems, the most frequently used teaching practice is asking students to discuss current issues, which is associated with open classroom climates. Second, as one of the least frequently used methods, asking students to work on projects is strongly related to students' perceptions of an open classroom climate in the two Asian systems and Norway, but not in Sweden. Third, studying textbooks is rather strongly associated with students' experiences of an open classroom climate in South Korea and Taiwan, while this correlation is weak in Sweden and not significant in Norway. Further, asking students to work in small groups appears to correlate strongly with

students' experience of an open classroom in Taiwan, while this correlation is not significant in the other three countries. Finally, proposing topics and issues for the following lessons has a weakly positive correlation with Norwegian students' perceptions of an open classroom climate.

Table 5: Correlation coefficients between students' perception of an open classroom climate and frequently used teaching methods in the classroom

	Norway	Sweden	South Korea	Taiwan
Students work on projects that involve gathering information outside school (e.g., interviews in the neighborhood, small-scale surveys).	0.26*	0.07	0.37*	0.63*
Students work in small groups on different topics/issues.	0.04	0.20	0.27	0.58*
Students participate in role-play.	-0.05	-0.14	-0.11	-0.04
Students take notes during teachers' lectures.	0.04	0.00	0.02	-0.03
Students discuss current issues.	0.25*	0.31*	0.51*	0.35*
Students research and/or analyze information gathered from multiple Web sources (e.g., wikis, online newspapers).	0.09	-0.09	0.16	0.10
Students study textbooks.	0.11	0.10*	0.31*	0.32*
Students propose topics/issues for the following lessons.	0.10*	0.02	0.04	-0.02

* $P < 0.05$.

Discussion and implications

The above findings enable us to respond to the two research questions introduced at the beginning of the article: a) What and which factors embedded in teachers' PD could foster an open classroom climate for student learning?; and b) Are these factors similar or different across education systems and cultures?

There are several commonalities found in the different cultures. First, in line with most literature on PD and teachers' sense of preparedness (e.g., Darling-Hammond, Chung, & Frelow, 2002; Kee, 2012), the results of our analyses indicate that the more PD training on CCE topics and teaching methods teachers receive, the higher their sense of preparedness. As indicated previously, teachers' sense of preparedness has a significant impact on their sense of self-efficacy, which directly influences teaching effectiveness. This implies that proper and carefully planned preservice and in-service PD should be offered to teachers who teach CCE-related subjects. Of the four cultures, Taiwan is the only place where CCE is taught as an independent subject, while there are seven CCE-related themes taught in other subjects. This might explain why teachers in Taiwan receive the most education. In the other three countries, CCE is integrated into other subjects; in the two Nordic countries, CCE is a cross-curricular theme embedded in general education objectives. South Korea can learn from the other three cultures in how to integrate CCE-related topics into different subjects systematically. Besides, the practice of integrating CCE into different

subjects suggests that PD training on CCE and teaching methods should be offered not only to teachers who teach CCE-related subjects but also to teachers of all subjects.

The findings also indicate that teachers who feel prepared use more student-centered teaching methods such as role-playing, student research, student discussion in the classroom, and asking students to propose lesson topics. This implies that teachers should receive quality PD training that can help them feel better prepared to teach, and it can also increase teachers' content knowledge to help them employ different teaching approaches. According to Monk's (1994) findings, good subject knowledge enables student teachers to teach the same materials using different pedagogies and from different perspectives. Additionally, Tsui (2003) found that "teachers who had better subject matter knowledge were observed to be able to help make conceptual connections, provide appropriate and varied representations, and construct an active and meaningful dialogue with students" (p. 54). This means that good content knowledge is helpful for teachers in creating an open classroom climate. This implies that when designing the curriculum for PD training, it is important to provide student teachers and in-service teachers with good and relevant subject knowledge. It is evident that "a good grasp of subject area is a necessary but not a sufficient condition for effective teaching" (Monk, 1994, p.142), teachers' content pedagogy is an essential factor for effective teaching (Cohen & Hill, 2000; Shulman, 1987). From the list of the teaching methods described earlier, it is evident that more CCE-specific teaching methods are needed. One of the most important functions of CCE is to motivate and engage students to become active in a democratic society, which distinguishes the content pedagogies of CCE from other pedagogies. Teachers who teach CCE-related topics should have opportunities to learn more about how to involve students in the participation of democratic life.

A surprisingly common phenomenon is the use of similar teaching methods across the four cultures. Approaches such as lecturing on textbook content, notetaking during lectures, and student discussions are dominant in CCE classrooms in all four cultures. This indicates that teachers tend to use more traditional teaching methods in their CCE classrooms. When looking closely at these findings, questions arise as to what types of content and pedagogical knowledge are being presented in CCE-related teacher training in these four systems. We must be aware that CCE involves much more than overloading students with textbook knowledge. It is more important that they also possess the awareness and competence required to engage in a rapidly developing world. It is not easy for students to gain these competencies in traditional classrooms. Nonetheless, studying textbooks is strongly associated with students' experiences of an open classroom climate in South Korea and Taiwan. A possible explanation would be that students have been given opportunities to discuss textbook materials amongst themselves or with the teachers.

Further, our results also show that the most frequently used teaching method, "students discuss current issues", is significantly and positively related to students' experiences of open classroom climates in the four cultures. The more teachers use this strategy, the more students experience open classroom climates. Teaching current issues in an open

classroom climate has “tremendous potential to change how students respond to their world and to, ultimately, make the world a more equitable place” (McCafferty-Wright & Knowles, 2016, p. 113). This implies that teachers should be encouraged to use this method in their classroom through in-service PD training, which is an important channel where teachers can update their knowledge of current issues for CCE and of the different methods and technologies that can aid them in their practice.

When examining the relationship between PD and teachers’ sense of preparedness, the four cultures differ. Specifically, in the two Nordic cultures, PD has a moderate positive correlation with teachers’ sense of preparedness, while it is strongly associated with teachers’ sense of preparedness in the eastern cultures. It is possible that the values of democracy and democratic activities are integrated into education and everyday life as early as in early childhood education in the two Nordic countries, while the two eastern cultures are newly established democratic systems with around five decades of history. The long tradition of democracy has provided teachers with more knowledge of CCE-related topics, which helps them feel prepared to teach CCE content. Nonetheless, the practice of integrating the values of democracy and democratic activities into education and everyday life as early as in early childhood education in the two Nordic countries can be an inspiration for their eastern counterparts and beyond.

Interestingly, one teaching method (“students working on a project”) is found to enhance students’ perceptions and experiences of open classroom climates in the two Asian systems and Norway, but not in Sweden. It may be that students work on projects independently in Sweden, while they do so collectively in the other three systems.

As for the differences in students’ perceptions and experiences of teachers’ teaching methods and open classroom climates, we should consider the possibility that although the teaching methods appear to be the same, teachers may use them differently (Cohen, & Hill, 2000) and involve students to different degrees in different cultures and even the same culture.

To conclude, although we do not find a direct relationship between teachers’ PD and students’ perceptions and experiences of an open classroom climate, we do find that teachers’ PD influences their sense of preparedness, content knowledge, and teaching methods, with teaching methods directly affecting students’ experiences of an open classroom climate. These findings suggest that PD matters not only for CCE but for other subjects in general. It is important that both student teachers and in-service teachers are provided with quality PD opportunities. “Effective professional development for teachers is a core part of securing effective teaching” (Department of Education, 2016, p.3).

We have to admit that our study has limitations insofar as the data source relies solely on the ICCS 2016. During data analysis, we have observed that questions concerning PD in the teacher questionnaire need updating especially the items of PD of teaching methods that are too general and lacking CCE specific pedagogies in their current forms. We thus call for future research to explore major stakeholders’ perspectives of teachers’ PD for CCE and an update of questions asked in teacher questionnaires in future ICCS study.

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