Exploring the characteristics of Science Teachers' Professional Learning Communities (PLCs) Within- and across schools in Korea and Indonesia

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Research Team

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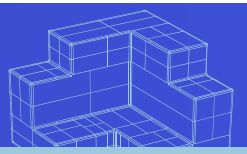
≫Background of the research



» **Emphasis of professional development of science teachers through professional learning communities (PLC, hereafter);**

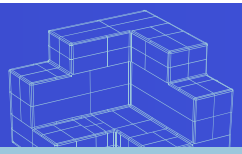
— **In Indonesia as well as Korea, teachers' professional development activities are active through PLCs.**

— **Teachers in PLCs are carrying out various activities such as reorganizing curriculum, enhancing class expertise, and enhancing evaluation expertise.**

— **Different from previous studies that explored the general characteristics of science PLCs, in this study we will explore the differences between in-school and out-of-school science PLCs in Indonesia and Korea.**

— **Through this, international comparison of specific activities of science PLCs, along with exploring tasks and ways to improve within- and across-school PLCs.**

» The Literature Review: Various forms of PLC



» **Professional learning communities (the US, England)**
» **Collaborative teacher groups (the UK, Canada)**
» **Lesson study groups (Japan)**

» **Features of PLC:**
1) Culturally scripted
2) Contextually situated
3) Democratic schools (i.e., distributed leadership)
4) Collective responsibility for student learning

≫Background of the research

Changes in Educational Environments in Korea

≫ Introduction of the high school credit system & need for secondary school teachers with multi-curricular competency;

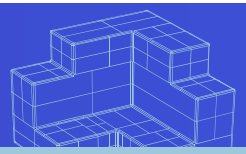
≫ Revision of school curriculum (i.e. 2022 revised curriculum)

≫ Reform of the teacher training system (i.e. Consolidation of primary and secondary tr. education programs triggered by(?) rapid decline in the school-age population;

≫ post-Covid-19, in the era of the 4th industrial revolution with AI as the core;

→ new teacher roles and professional competences are required.

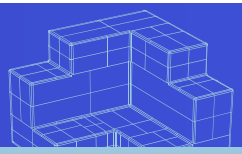
≫Background of the research

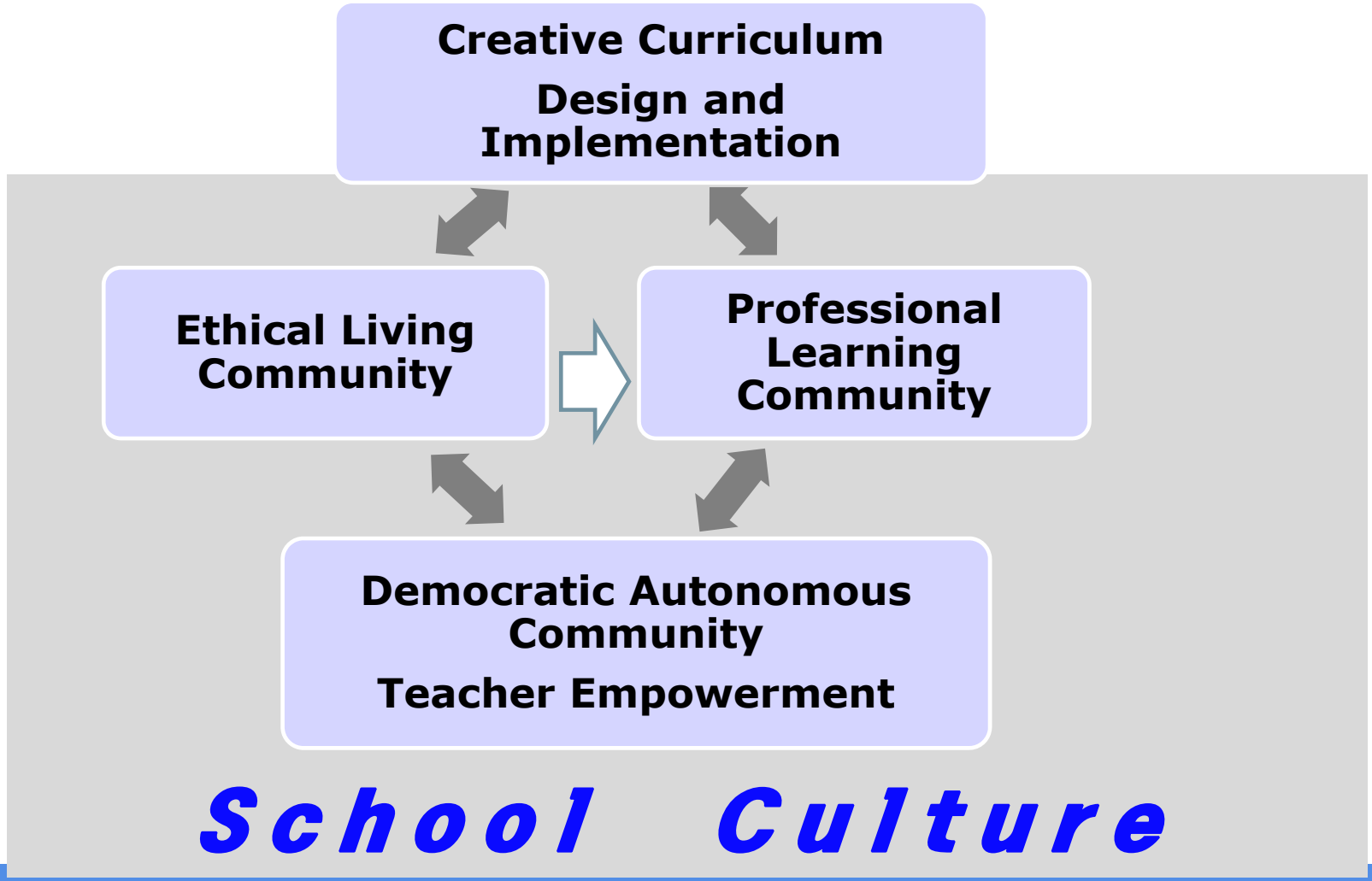


» **The national curriculum in Korea features deregulation to ensure more curriculum autonomy at the local level.**

» **This study discusses the vision of future schooling, the required role of teachers in future schools with the demand of decentralized curriculum, and the design of creative school curricula by teacher PLCs.**

≫PLC & school-based curriculum



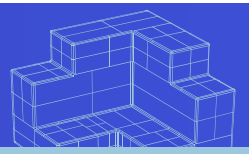


Science PLCs
Within- and across schools

Research content

- To explore the characteristics of within- and across-school PLCs: motivation and reason for PLC formation, etc.
- To explore the activities of science PLCs within- and across-schools, that is, what the PLC does;
- To explore how within- and across-school PLCs are differentiated in terms of their impact and performance outcome;
- To explore the PLC's tasks and ways to improve it by examining the actual operation of within- and across-school PLCs;

» Data collection and analysis



» **Conducting a survey: to explore the characteristics of science PLCs that differentiate them from the existing cross-curricular PLCs;**

» **In the survey, the contents related to the activity characteristics of within- and across-school PLCs are investigated (e.g., online meetings);**

» **Validity of questionnaire was secured through pilot study using a draft questionnaire;**

≫Survey Questionnaire

Background Information	**Gender, Major or main area(s) of teaching, Years of teaching, Level of school**
Sample questions	≫ **What type of PLC do you belong to? (Example: subject council, grade level council, village education community, focus on class innovation, etc.)** ≫ **Why do you think the PLC to which you belong was created?** ≫ **How do you think colleague-ship (community spirit) was secured in your PLC?** ≫ **What do you think is the aim (or driving force) of your PLC?** ≫ **How does PLC activity affect your PLC members (including you)?** ≫ **What is the role of your PLC in the professional development of science teachers? (Example: curriculum reconstruction, class improvement, student evaluation improvement, teacher professional competency development, etc.)** ≫ **How can you describe the outcome of your PLC?** ≫ **What is your PLC lacking or needing support?** ≫ **What are the characteristics of your PLC?**

» Data analysis

» Qualitative data analysis; grounded theory;

» Conduct Semantic network analysis;

» Perform Semantic network analysis through

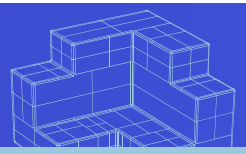
① data cleaning,

② generating GML (Graph modeling Language), a text file that calculates the frequency of occurrence of words by completing pre-processing analysis,

③ using text with high frequency of occurrence in the entire data based on GML; and visualize the result of semantic network analysis (using Gephi 0.9.3);

» Derive the meanings of keywords through various statistical processing (e.g., modularity cluster analysis, ego-network etc.);

≫Expected results, outcomes (1)



» The results will include both within-school and across-school science PLCs formed for professional development related to science teaching and learning.

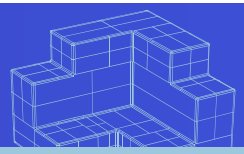
» Both science PLCs would have the characteristics of a 'practice community' that developed a cooperative relationship through reciprocal participation, focusing on shared issues among members.

» Regarding activities and roles as PLC, within-school and across-school science PLCs would share such features as (1) collaborative professional development, and (2) interpersonal education such as mentoring for novice teachers.

» Within-school PLCs might focus on microscopic problems such as curriculum reconstruction, while across-school PLCs on macro problems such as teacher professional development.

» In terms of PLC's influence and outcomes, science PLCs would have a positive effect not only on the teachers themselves, but also on the students and the teacher culture in the school.

» Expected results and conclusions (2)



» In addition, science PLCs should conduct a joint research or re-education with universities, that is, teacher educators.

→ Need role change of teacher education universities;

→ The necessity of active support for science PLCs, the necessity of developing a cooperative system between PLCs and universities;

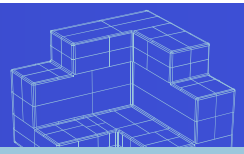
→ Well-functioning university-PLC partnership would support the collaboration between tr. educators and practitioners in ways that interactively enrich the field.

→ In particular, joint research between the university and the PLC would show the future of the PLC as an 'inquiry community'.

» PLC in partnership with a collaborating university;

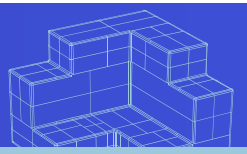
» Networking PLCs through web-based infrastructure;

≫Theory into Practice (TiP)



	知, knowledge	→→	智, wisdom
		←←	
	reflection, Turning your gaze inside and seeing yourself		
Teacher knowledge	Theoretical knowledge(knowing), Knowledge		Practical, embedded knowledge(living), wisdom
Mode of practice	Evidence-based practice		Reflective practice

Expected conclusions



- In a competency-based curriculum, teachers themselves need to be the 21st century learners and organize strong communities composed of professional practitioners.
- PLCs promote teachers' individual and collective learning of new attitudes, values, knowledge, competencies, etc., through solving various problems raised in educational practices (e.g., survival during the COVID-19);
- PLC is a field that takes place self-regulated learning where teachers can experience extending possibilities.
- PLC enables teachers to learn ways to make others to grow.
- PLS functions as an action research system focused on collaborative research and practices. Schools need to change into action research systems to solve problems using collective intelligence of school members.
- PLC should provide teachers with self-reflection opportunities.

» Preliminary reflection

» **Produce international comparative data on science PLC activities and characteristics;**

» **Provide specific international comparative research cases for research progress with other participating countries;**

» **Provide a driving force for continuous joint research such as teacher (re)education and PD programs through global-level PLCs;**

<Thank you>