The role of university teacher educators in Science Teacher Professional Learning Communities (PLCs) in Korea and Indonesia

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Research Team

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≫Background of the research

» Sharp decline in school-age population

»Teachers with multi-curricular competency by completing 'convergence major' in connection with first-class teacher training

→ With High-school credit system more emphasis on Convergence education (e.g. AI Convergence Education Major, STEM, STEAM)

» Introducing the 'Teaching Practicum Semester System' to better understand the school/classroom environment

» Transition to the graduate school of education teacher training system

» Integration of primary-school teacher education and secondary–school teacher education institutions

» Emphasis on Ecological Transformation Education – Anthropocene Discourse and the Neo-Materialism Paradigm

교육부

press release
2021. 2. 16.

2025, Comprehensive implementation plan for high school credit system

◈Achievement evaluation for all elective courses,

◈ Graduation upon acquisition of 192 credits

교육부

press release
2021. 7. 13.(Tues)

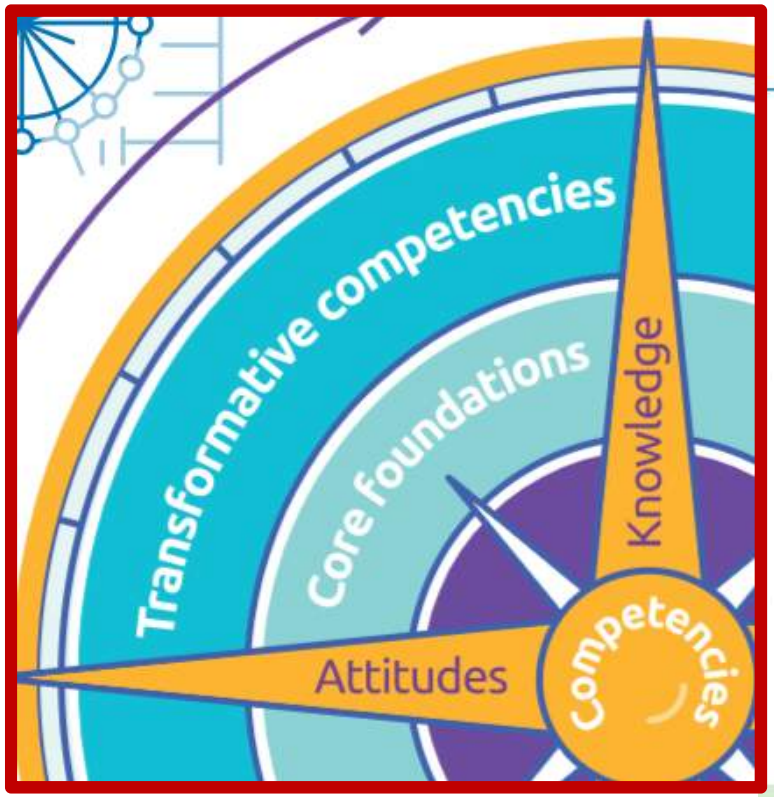
Drawing future teachers together with the people- Collect public opinions on the 'teacher training system development plan (plan)'

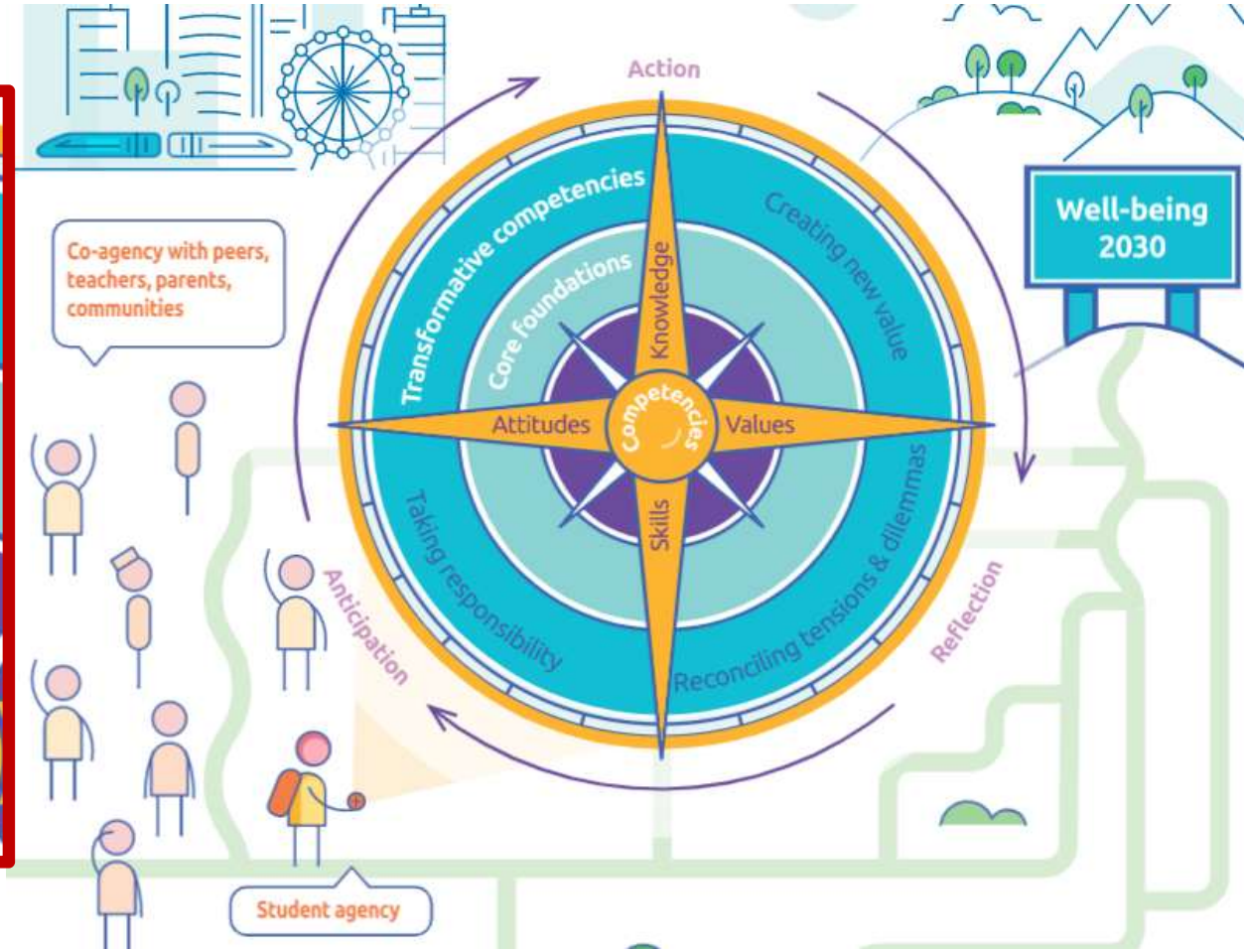
◈ Introducing the ‘Teaching Practicum Semester System’ to better understand the school/classroom environment

◈ Teachers with multi-curricular competency by completing ‘convergence major’ in connection with first-class teacher training

≫OECD Education 2030

http://www.oecd.org/education/2030-project/teaching-and-learning/learning/





» Research Method

» Open-ended response survey

» Online survey conducted in October, 2022

» Survey participants

	KOREA	INDONESIA
Within school	55 (53.4%)	88 (50.6%)
Out of School	48 (46.6%)	86 (49.4%)
Total	103	174

» 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.);

≫Survey Questionnaire

□ **Background Information**

1. Which of these describes your PLC?

① Within school PLC; ② Across (out-of) schools PLC

2. What type of PLC do you belong to? (Example: subject council, grade level council, focus on class innovation, etc.)

3. Why do you think the PLC to which you belong was created?

4. How do you think colleague-ship (community spirit) was secured in your PLC?

5. What do you think is the aim (or driving force) of your PLC?

6. How does PLC activity affect your PLC members (including youself)?

7. What is the role of your PLC in the professional development of science teachers? (Example: curriculum reconstruction, class improvement, student evaluation improvement, etc.)

8. How can you describe the outcome of your PLC?

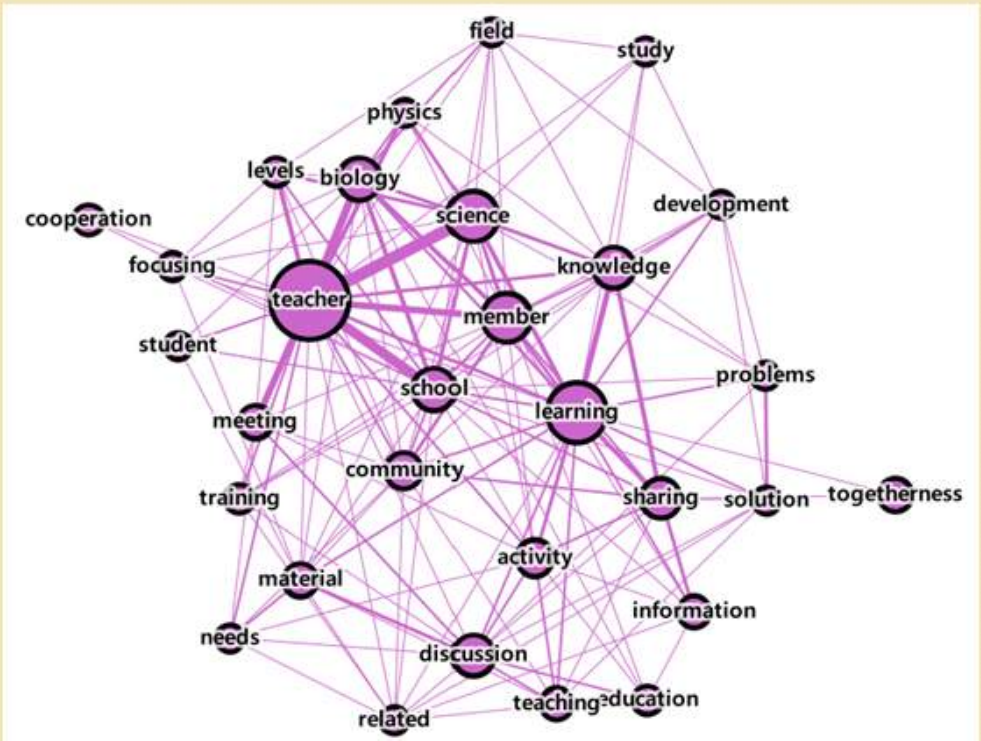
9. What is your PLC lacking or needing support?

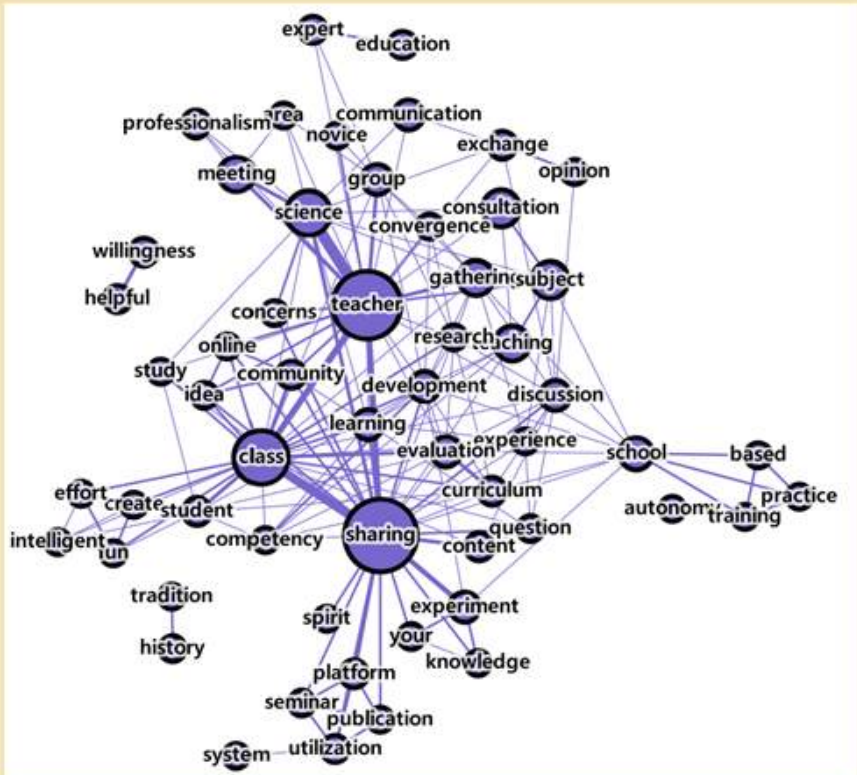
10. If Teacher Training Colleges (Teacher Education Universities) participates in PLC operation, what role or support do you expect from them?

Science PLCs
Within- and across schools

→ Results of Semantic network analysis

Unique feature of your PLC





Keyword	Wt.	Deg.
teacher	37	21
learning	25	21
science	19	16
member	18	15
school	14	20
biology	14	15

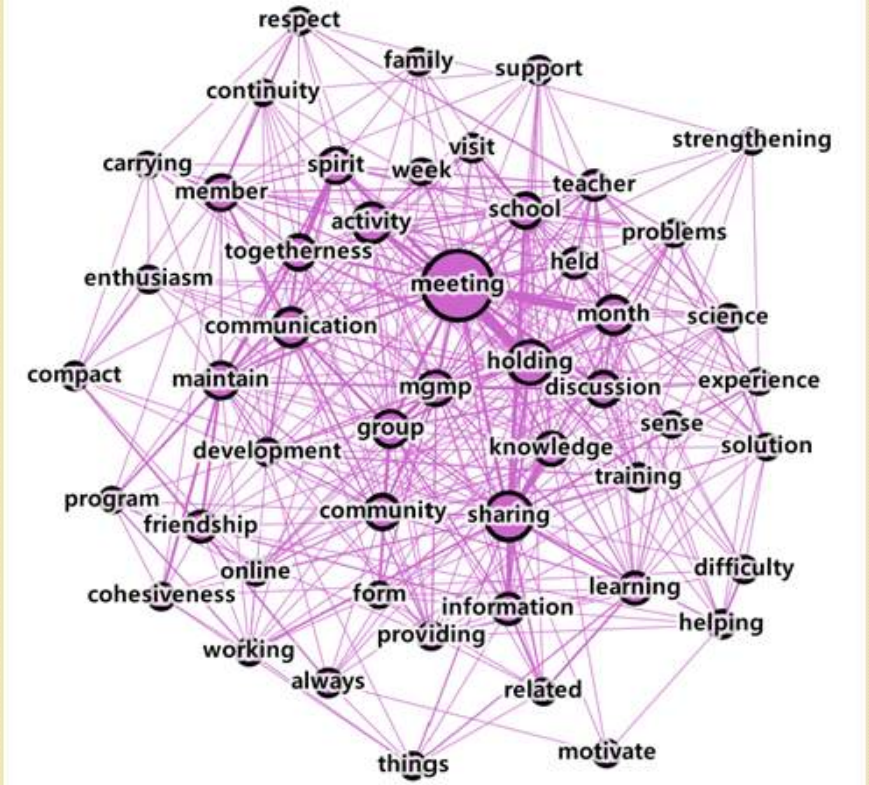
(science, biology, physics)-level;
science-member-learning,
science-knowledge-learning,
knowledge-learning-sharing

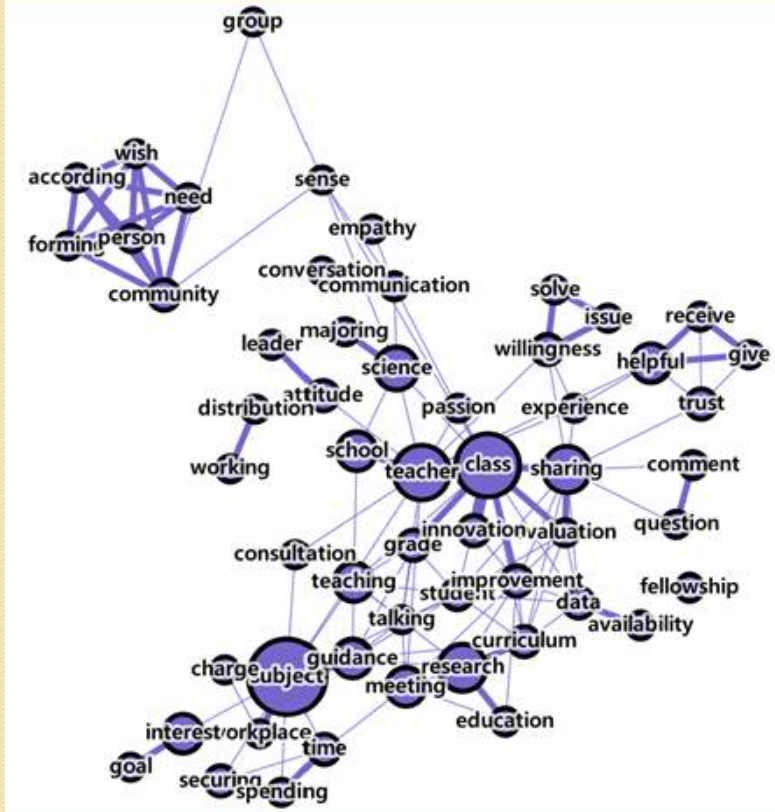
Keyword	Wt.
sharing	22
teacher	20
class	14
science	10
consultation	7

teacher-sharing-experiment(platform)

teacher-science-meeting,
teacher-class-sharing

Ways to secure colleague-ship(community spirit) in your PLC

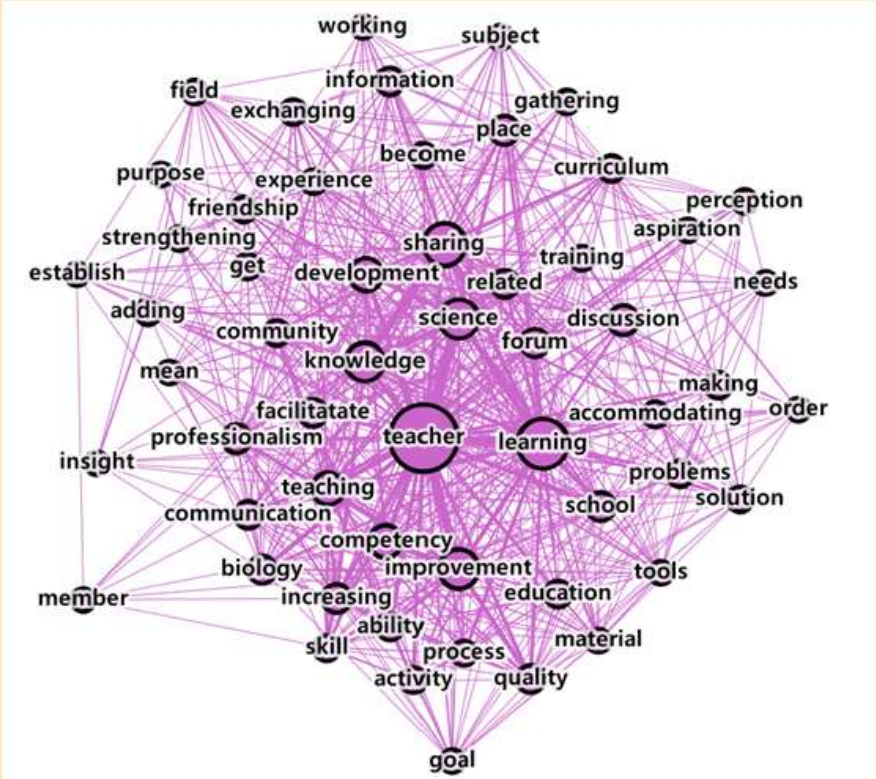


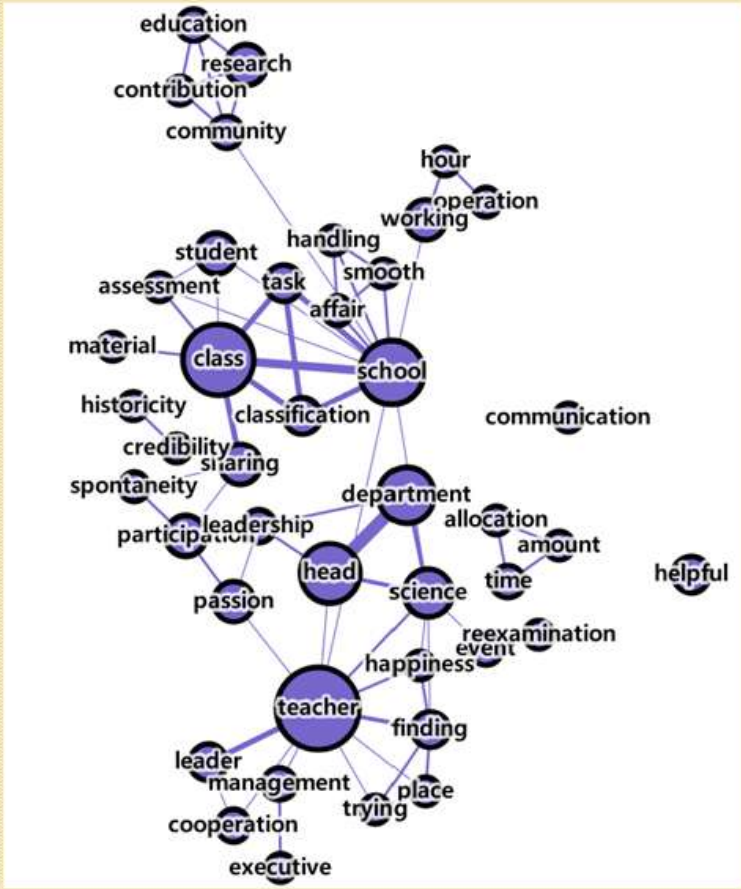


spirit-togetherness(activity), meeting-month(holding),
meeting-group-mgmp (PLC),
sharing-knowledge-maintain-friendship-program

class-teacher(sharing), class-sharing-innovation(evaluation),
subject-guidance, community-person-need(wish),
willingness-solve-issue

Driving force of your PLC

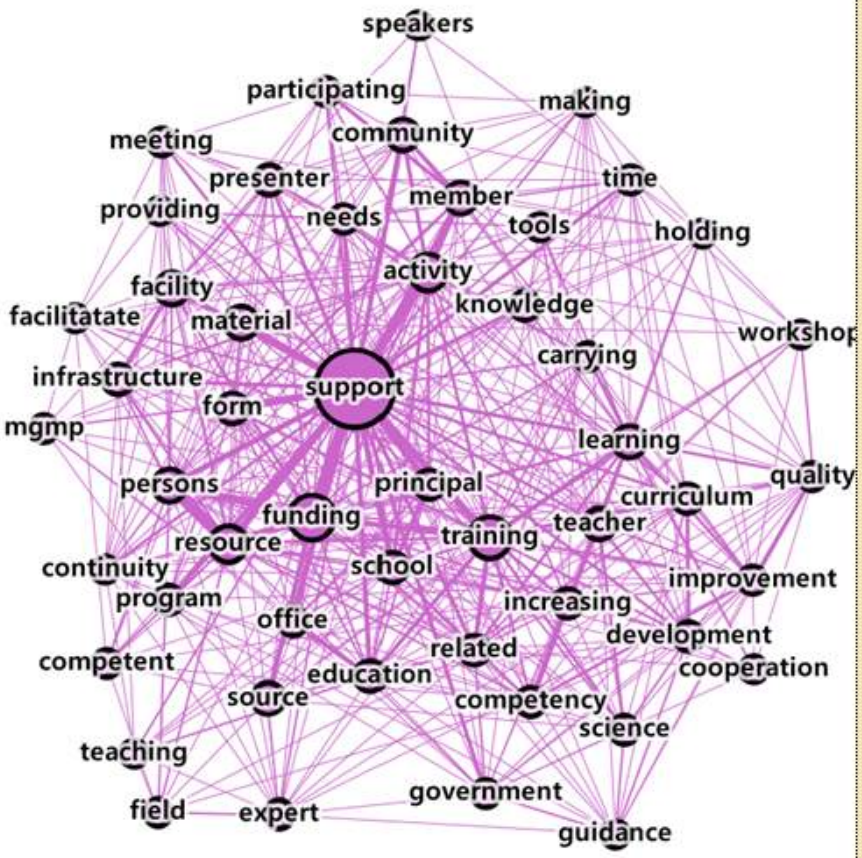


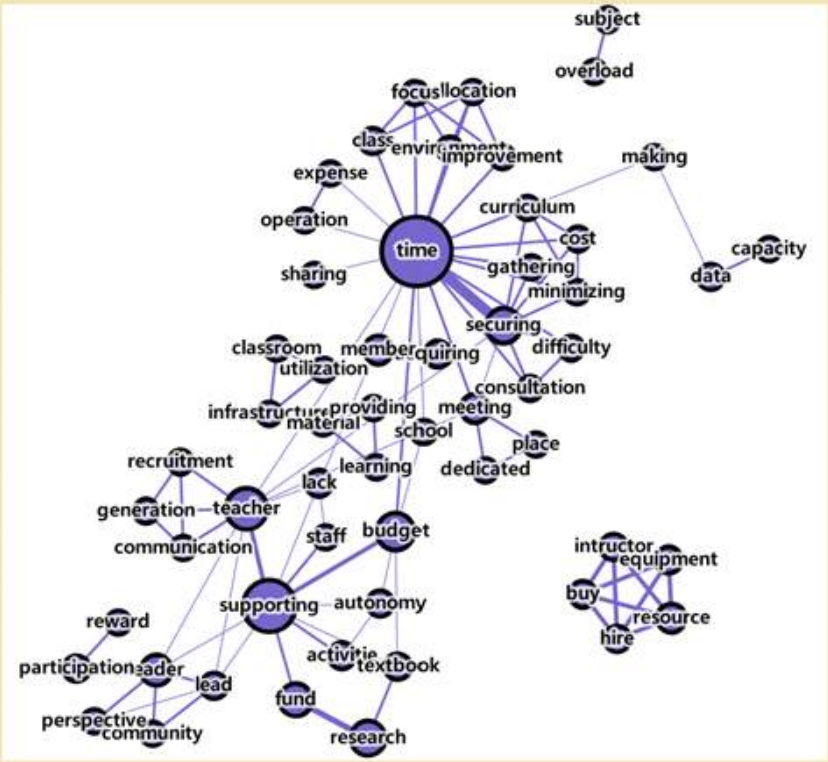


teacher-science-learning(knowledge),
sharing-development-science-forum,
competency-improvement (increasing),
science-related-forum-discussion

class-school-task (Division of work),
head-department-science, teacher-leader-finding,
research-education-community,
working-hour-operation

Areas of support for PLC

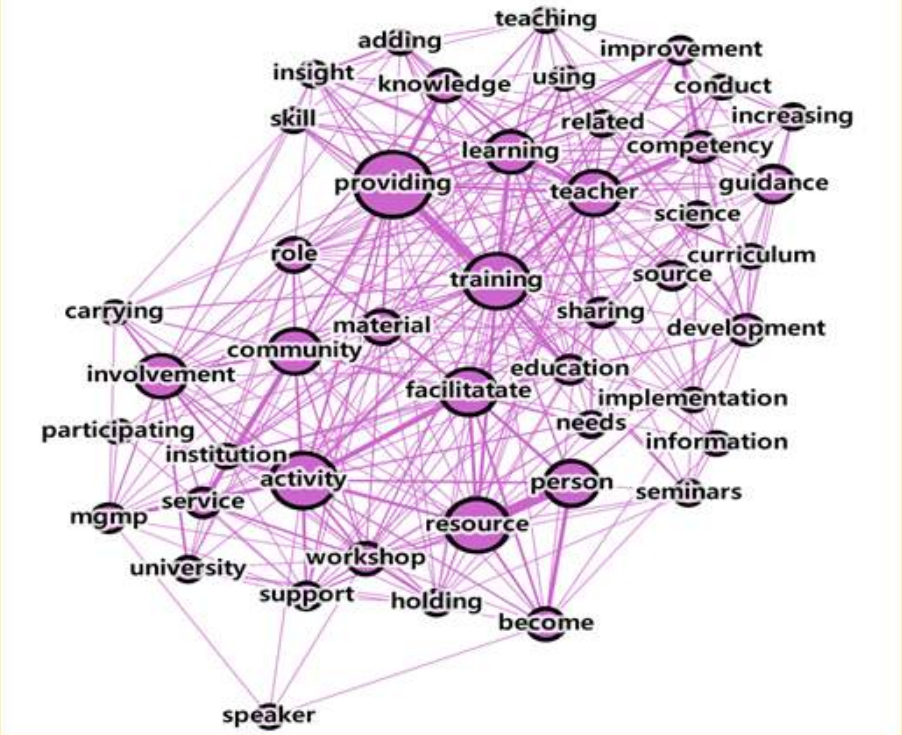


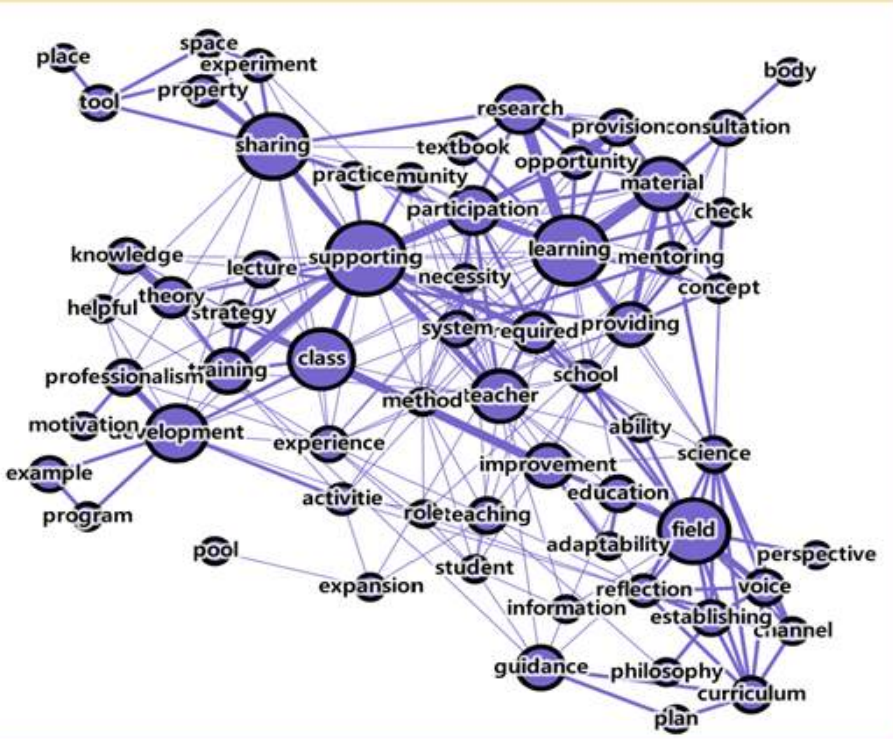


support-funding-office, funding-resource-persons, support-material-facility-infrastructure, teacher-learning-curriculum, activity-member-community

time-securing-gathering (difficulty), supporting-teacher (budget), research-fund (textbook), time-budget-supporting, buy-equipment-resource

Role of Teacher Training Colleges (Teacher Education Universities)





providing-training-teacher,

teacher-competency (learning),

facilitate-activity (community),
community-involvement-role,

resource-person-become, activity-workshop-support,

guidance-curriculum-development

supporting-class-improvement,

supporting-training-theory,

sharing-property (experiment),

learning-material-provision,

participation-opportunity-research,

field-education-improvement

≫Theory into Practice (TiP)

	知, knowledge	→→	智, wisdom
	episteme	←←	phronesis
	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

Conclusions (1)

» **Professional development**

In-service growth opportunities are an important part of teachers' ongoing development,

Recently, PLCs have become common in attempts to foster ongoing, classroom-focused professional growth. Regardless of the exact purpose or format, most professional development is based on the assumption that it will lead to increased teacher knowledge and skills, which in turn will lead to improved student outcomes.

With COVID-19 pandemic there has been a decrease in funding for support for professional development programs.

» Conclusions (2)

In-service Science teacher education

» Policy trends in science teacher education

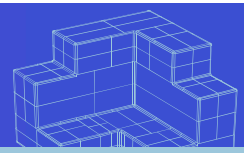
→ substantial internships offering pre-service teachers opportunities to practice science teaching in authentic classrooms;

» Curriculum reform

→ developing students' 21st century skills

→ Science content: big ideas in a given content area

» Conclusions (3)



- » Job-embedded professional learning taking into account what is known from research(e.g. what is high-quality teaching in competency-based science curriculum, and how to transfer that to the classroom;
- »PLCs have different needs based on teachers' backgrounds and where they are in their career trajectories;
- → PLCs should have clear goals in mind, start from the needs of the members, and be carefully designed using what is known from research and wisdom of practice about the teaching & learning of science;
- » Professional training for master teachers and other experts in science education as leaders of PLCs.
- » Conducting research to identify the critical elements of successful PLCs, their relationship to developing teacher competences, and how these elements can be replicated in other PLCs;

» Implications

» Need role change of teacher education universities;

→ 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.

→ Joint research between the university and the PLC would show the future of the PLC as an 'inquiry community' (i.e. teachers as researcher)

*** Produce international comparative data on science PLC activities and characteristics; Provide a driving force for continuous joint research such as teacher (re)education and PD programs through global-level PLCs;

<Thank you>