Student’s connections about estimation ideas in classroom using lesson study and open approach

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Mathematics is a part of real life (Adnan, Hakan, Serkan, & Osman, 2009). A new school mathematical idea should be focused on students’ ideas that derives from students’ real-life situations. In other words, this teaching concept is to connect the students’ ideas to the mathematical ideas (Inprasitha, 2014). Thai educational system has been attempted to be shifted from traditional teaching approach that emphasizes transferring teachers’ knowledge to the students to child-center approach (The Academic Department, 2001). To develop Thailand’s Mathematics teaching, Inprasitha (2010) integrates Lesson Study and Open approach as a guided teaching approach. The learning processes of this approach involve exploring the students’ ideas (Evitts, 2004). When the students face with problem situations by themselves, mathematical connection will occur (NCTM, 2000). This will lead to the transfer of learning to their real-life situations. On the other hand, real-life situations should be able to be connected to what the students learn in the classroom (Hodson, 1995).

This study employs a qualitative research design. It aims at investigating mathematical connection about approximate ideas in the classroom by using Lesson Study and Open approach. The data were collected from 36 fifth grade students at Demonstration School of Khonkaen University (Primary Level) (Suksasart). A lesson plan on estimation (Let’s go to the zoo Unit) was collaboratively designed by a researcher and co-researchers. There were three observers during lesson plan implementation. The data were analyzed through Protocol which was retrieved from video recorder and voice recorder, and the students’ task products. This study follows NCTM framework, including 1) Recognizing and using connections among mathematical ideas; 2) Understanding how mathematical ideas interconnect and building on one another to produce a coherent whole; and 3) Recognizing and apply Mathematics in contexts outside of Mathematics together with four stages of Open approach proposed by Inprasitha (2003).

The research findings revealed that the students’ ideas were relevant to all aspects proposed in NCTM framework’s mathematical connection (2000). According to aspect 1, the students could recognize and use connections among mathematical ideas. To illustrate, the first problem situation asked the students to “Estimate the numbers of the zoo visitors (rounding them to the nearest thousand)” and “Identify the higher numbers of the zoo visitors in the afternoon than the ones in the morning (rounding them to the nearest hundred)”. It was found that the students estimated the value of each number before they calculated the sum. Also, the students estimated the value using hundred and thousand integers. With regards to aspect 2, the students could understand how mathematical ideas interconnect. This aspect was observed in the third problem situation which asked “They buy stuff before going to the zoo. If they pay more than 1500 Yen, they will get a free
entry ticket for 1 person.” As the three given numbers included two ten integers: 150 and 1,320, the students estimated them to the nearest number by rounding them to the nearest ten. Finally, aspect 3 stated that the students could recognize and apply Mathematics in contexts outside of Mathematics. This aspect was discovered when the students solved the second problem situation which asked them to calculate the total expense they should pay for visiting the zoo. The students estimated the numbers by rounding them to the next thousand. However, after proving the answer with the real situation, they found that they would not have enough money to visit the zoo. To adjust to the real context, the students estimated the numbers again by rounding them to the next hundred.

Keywords: Student’s Connections, estimation ideas, Lesson Study and Open Approach
Mathematical representation of students using instructional materials on pattern and relations in lesson study and open approach

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Mathematical representation make a students’ transmit meaning And understand mathematical concepts. (Cifarelli,1998) Instructional Materials. There is a role for students to be encouraged mathematical problem solving, by the understanding of the students. (National Council of Teacher of Mathematic [NCTM], 2000) Classroom research using Teaching methods in Open Approach makes concept and multitudinous representation in classroom. (Goldin,2002) Open Approach there are 4 steps : 1) Posing Open-ended Problem 2) Students’ self learning 3) Whole Class Discussion and Comparison and 4) Summarization Through Connecting Students’ Mathematical Ideas Emerged in the Classroom (Inprasitha, 2010) Using the Representation asset for students to understand the meaning and structure of mathematics in mathematical problems solving. (Inprasitha, 2010) Using the Representation asset for students to understand the meaning and structure of mathematics in mathematical problems solving.

This research aimed to study mathematical representation of students using instructional materials on pattern and relations in Lesson Study and Open Approach of Inprasitha (2011). With 4 inservice teachers and 3 Master student in Lesson Study team. This qualities research analyze data from tape recordings and activity performance. The target group was 7th grade students at Demonstration School in first semester of 2018 (35 students). In problematic money of saving. Following conceptual framework mathematical representation Inprasitha (2016); Representations of real world Semi concrete aids and representations of mathematical world.

The results from mathematical representation of students using instructional materials on pattern and relations, that in context of classroom using Open Approach 4 step there were students showed representations in 3 elements of flow lesson. 1) Posing Open-ended Problem: students’ to show Representation of real world, that is savings day and amount money of saving. 2) Students’ self learning : students’ to show Semi concrete aidson pattern and relations and to show representation mathematical world onmathematical expressions of representation. 3) Whole Class Discussion and Comparison: students’ to show Semi concrete aidson pattern and relations and to show representation mathematical world onmathematical expressions of representation. 4) Summarization Through Connecting Students’ Mathematical Ideas Emerged in the Classroom: students’ to show representation mathematical world using expressions to descriptoraltamount money of saving and switch expressions to multiplication.

References:


**Keywords:** Mathematical Representation, Instructional Materials, Lesson Study, Open Approach
Students' integrative thinking in mathematics classroom using open approach lesson study context

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Shimada & Becker (1997) use open-ended problems in assessment "Mathematical Thinking". Maitree Inprasitha (2003) introduced two educational innovations to change the paradigm shift of teachers in teaching and to improve their teaching. An Open Approach by designing open-ended mathematical activities. Lesson Study is used to develop teacher collaboration to improve and develop Open Approach methods. In innovative mathematics, Lesson Study and Open Approach mathematics classrooms, students are encouraged to develop mathematical thinking skills (Maitree Inprasitha, 2014) and integrative thinking is important to solve problems and develop strategies that will motivate problem solving to motivate students. Students have a variety of ideas and can be used in a variety of ways. Integrative thinking consists of three types: 1) High-level integration 2) Comprehensive integration and 3) Extension thinking (Isoda and Katagiri, 2012, Katagiri, 2004).

The purpose of this research aimed to explore students' integrated thinking during the problem solving in mathematics classes where use Open Approach in Lesson Study context. Research methodology focused on protocol analysis and descriptive research. Data were collected from 19 students in the second grade of elementary school in Khonkaen province. The school has been used Lesson Study and Open Approach since 2006. This research follows the weekly cycle of Lesson Study of the members of the Lesson Study team as follows: 1) Collaborative Plan 2) Collaborative Do 3) Collaborative See (Maitree Inprasitha, 2006). Instrument used to collect data include: Lessons plan, field notes, and students work from practice in number and operation. Then the data was analyzed based on conceptual framework of Isoda & Katagiri (2012).

The results revealed that in the context of Lesson Study and Open Approach, Step 1 Students achieve high-level integration: Students find that vertical additions can produce results more easily than combined numbers horizontally. Step 2 Students develop extension thinking: Students draw diagrams and use blocks to find positive results. Step 3 Students achieve high-level integration: Students have discovered that vertical addition must be digitized. Tens and ticks Main unit and positive. Step 4 Students achieve comprehensive integration: Students find the results of vertical additions easier than horizontally, and when the students switch to positive, they conclude that, when switching, the results are the same.

Keywords: Mathematical Thinking, Integrative thinking, Lesson Study, Open Approach
**Abstract ID: D0509**

**Students’ understanding of fractions in mathematics classroom using lesson study and open approach**

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Teaching and learning fractions has traditionally been one of the most problematic areas in primary school mathematics (i.e., part-whole, ratio, operator, quotient, and measure). Iwasaki (2005) added that teachers think that understanding of fraction was important. If students wanted to learn some content in mathematics, the fraction is the fundamental content to learn further lesson. In addition, fraction learning relates student daily life.

This study aims to observe students’ understanding of fractions in mathematics classroom using Lesson Study and Open Approach. The target group were eighty-one 6th year primary students, 2016 academic year from Ban Ma Ue School, Roi-Ét Province, Ban Khambong 1 School, Mukdahan Province, and, Chumchon Bankaengkhro Nongphai School, Chaiyaphum Province. These school participated in lesson study and open approach at least 3 years. The data was collected from 7 abilities of the students’ understanding of fractions test according to the Nicolaou and Pitta-Pantazi (2014) and classroom observation. Data analysis based on mixed methodology.

The result found that, classroom using Lesson Study and Open Approach students understood the concept of fractions as follows; 1) 88.27% of students well recognized the fraction through its pattern and basic structure and the fraction recognition was found in every processes of an Open Approach, 2) 50.62% of students recognized the definition and the mathematics fraction description. These students could define and describe the concepts of fraction to support their thinking ideas both writing and speaking, 3) 27.78% of students recognized the concept of argumentations and justifications about fractions. Students could decide about the fraction’s properties if they were true or not including clarified this deciding, 4) 53.09% of students recognized the relative magnitude of fractions. They could compare two-number fraction, 5) 58.64% of students recognized the concept of representations of fractions through the fraction figures representation and could plot symbolic fraction equations. They could describe the concepts of fraction and also decoded the representations of fractions from the other to another type, 6) 42.59% of students recognized the concept of connections of fractions with decimals, percentages, and division. Students recognized that the dividing line was the division of the numerator by denominator and the answer was in decimal, and 7) 63.58% of students recognized the concept of reflection during the solution of fraction problems since they could clarify their thinking and answering ideas during the solution of fraction problems including observed the solution of fraction problems premise and they could verify the solution of fraction problems if they were true or not.

**Reference**


**Keywords:** Students’ Understanding, Fractions, Lesson Study, Open Approach
Abstract ID: D0526

Using coaching and mentoring process through professional learning community to promote ability in collaborative active learning of teachers in schools under Pattaya City

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The objectives of this research were to, 1) study ability in writing Collaborative Active Learning of Teachers in schools under Pattaya City, after using Coaching and Mentoring Process through Professional Learning Community. 2) study ability in Collaborative Active Learning of Teachers in schools under Pattaya City, before and after using Coaching and Mentoring Process through Professional Learning Community. The population of this study were 680 teachers of Pattaya City School, the purpose sample of this study were 319 teachers in schools under Pattaya City of academic year 2018. The member of Professional Learning Community of this study include planner, buddy, mentor, internal supervisor and external supervisor, were participated in all 5 steps of Supervision Process based on Lesson Study through Professional Learning Community, which were (1) Content Analysis and Process (2) Design and develop a collaborative active learning plan, (3) Do and observe teaching, (4) Reflect, and (5) Redesign. The experimental instrument were a manual of Coaching and Mentoring Process through Professional Learning Community and research instruments were ability in Collaborative Active Learning assessment and reflective log. Collected data were analyzed by means, standard deviation and hypothesis by t-test. Qualitative data analyzed by content analysis.

The research findings:

1. After Coaching and Mentoring Process through Professional Learning Community, ability in writing Collaborative Active Learning of Teachers in schools under Pattaya City was in good level. When discriminate from indicators finding; Teachers have the ability in writing objectives and content knowledge were in very good level and other were in good level.

2. After Coaching and Mentoring Process through Professional Learning Community, ability in Collaborative Active Learning of Teachers in schools under Pattaya City was significantly increased before implementing at.05 level.

The reflective log of teacher findings: Teachers are satisfied with their peers in writing a learning plan. See the techniques and media to organize activities are clear, have a friendly atmosphere, not stress. Mentors can make plans for their teachers. Teachers are better prepared and taught than the school expects. Make it easy to see how the project works and do simple research to solve problems in the learning of the students. Internal supervisors and external supervisors have the information to fill and develop teachers in schools under Pattaya City.

Keywords: Coaching and Mentoring Process, Professional Learning Community, Collaborative Active Learning, Pattaya City, Thailand
The study of school mathematics content knowledge for teaching: Case study of pre-service mathematics teacher in lesson study and open approach context

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The aim of this research is to study the knowledge of school mathematics content of pre-service mathematics teachers in lesson study and open approach context. The study is qualitative research that emphasized on protocol analysis and analytic description. The target groups of this study were 5 primary pre-service mathematics teachers, from bachelor program in mathematics education, faculty of education, Khon Kaen University. They have studied with lesson study and open approach for four years. They teach 1st grade student by using lesson study and open approach. The researcher use protocol analysis to analyze the data with domains of mathematical knowledge for teaching by Ball, Thames & Phelps (2008).

The results showed that knowledge of school mathematics content of pre-service mathematics teachers in classroom using lesson study and open approach.

1) Five primary pre-service mathematics teachers have common content knowledge (CCK), they have knowledge of the real world of the 1st grade students when they see the picture, they can classify the kind of animals such as fish, turtle and bird. But they cannot explain the meaning of the number.

2) They have specialized content knowledge (SCK) are:
   2.1 Knowledge of real-world representation of 1st grade student by using images. For example, they know representation of semi-concrete mathematics of student by using the block and representation of the mathematical world of students by writing the number of objects. It is a concept to design learning activities.
   2.2 Knowledge about how to evaluate students' ideas. How students represent the method to solve problems. For instance, they know that students matched blocks with donuts, glasses, etc., a semi-concrete representation of mathematics, and they know the students wrote the number of blocks, a mathematical representation of the students.

3) They have horizon content knowledge (HCK) are:
   3.1 Knowledge that before the first grade students will be taught in the topic of number more than 10. Students need learning about the group or set of things, compering the number and one-to-one correspondent. In addition, they know that teaching the subject matter number more than 10. Students will learn the meaning of 1-9, the meaning of zero and decomposing of numbers.
   3.2 Knowledge of conceptualization when student solve the problem, they have to arrange of students’ ideas.

Keywords: mathematics content knowledge, pre-service mathematics teacher, lesson study, open approach
Abstract ID: D0592

Levels of discourse in mathematics classroom using lesson study and open approach

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This research aimed to analyze levels of discourse in mathematics classroom using lesson study and open approach. It use of qualitative research methodology by focusing on protocol analysis and analytical description. Target group was a mathematics teacher and 30 seventh grade students in 2nd semester of school year 2017 at Kaeng-Kro Wittaya School, Chaiyaphum. The research instruments were consisted of lesson plan, field note, students’ writing work, video recorder and camera recorder. The collected data was analyzed by 4 steps of open approach (Inprasitha, 2011; 2014) and levels of discourse (Stein, 2007).

Research result found that levels of discourse in mathematics classroom represented as following details: 1) Posing open-ended problem, it was found 4 levels of discourse. In early class of learning unit, it was found the level of 0-1 which the teacher had posed open-ended problem before explained the problem with asking some short question to the students for checking their understanding whereas in latter class of learning unit, it was found the level of 2-3 which the teacher had posed open-ended problem then the student questioned and discussed the problem together; 2) Students’ self learning, it was showed only the level of 2-3 which the students had questioned and explained about problem solving methods and the teacher had asked the students to clearly describe their problem solving methods together; 3) Whole class discussion and comparison, it indicated only 2 levels of discourse which were the levels of 2-3. In this discourse, students demonstrated and expressed their own problem solving ideas and other students questioned about their own doubt about each ideas in classroom. The teacher ordered the students’ ideas presentation; 4) Summarization through connecting students’ mathematical ideas emerged in the classroom; it illustrated 2 levels of discourse which this learning unit was found the levels of 2-3. In this discourse, teacher supported the students to ask, explain and debate about each solving problem method for summarization.

Keywords: Levels of Discourse, Lesson Study, Open Approach
Lesson study material cell structure to increase creativity by project method in SMA 4 N MALANG

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Lesson study is professional coaching teacher to improve professional competence, pedagogic, social and personality, critical thinking and creative. Critical and creative thinking in designing learning so that learners are also critical and creative. This study aims to describe the application of lesson study on cell structure materials of biology subjects. Type of research used descriptive. The subjects of the study were students of class XI IPA1 there were 34 people. Model teacher and observer from SMA 4 Negeri teacher and lecturer. Model teachers apply lesson study with step plan, do, see. Stage plan, model teacher designing chapter design and lesson design outside learning hours. Stage do, model teacher conducting learning and observer observing the implementation of learning for 100 minutes. Stage see, model teacher implements reflection with observer. Data were analyzed descriptively qualitative and quantitative. The results show that the students' creativity cycle I of 8 groups of average values of 80 in designing animal and plant cells, cycle II creativity of learners from 8 groups of average value 90. Model teachers do collaborative learning when designing Chapter design and lesson design material cell structure with peers, model teachers perform the implementation of learning with cell structure materials by project method. Observer to observe the learners about what is done by learners. Model teachers and observers reflect on the learning process that has been done. Lesson study provides learning for teacher models and learners in improving creativity. Findings, learners create creative models of animal and plant cells using plastic balls, sponges and plitisin. There is an increase in the creativity of learners from cycle I and cycle II by 10 points.

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Keywords: Lesson study, Creativity, Project Method, Cell Structure, SMA 4
The implementation of team games tournament (TGT) with batik card to improve students' learning outcomes in animal tissue material through LSLC

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This current study aimed at: 1) describing the activity of the students and teachers in the learning model of Team Games Tournament with the smart batik card media in animal tissue material; 2) To describing the students’ learning outcomes in animal tissue material with implementing Team Games Tournament (TGT) With Batik Card. 3) uncovering obstacles faced in implementing Lesson Study (LS); and 4) investigating the ways to cope with those obstacles during the implementation of LSLC.

This study employed Classroom Action Research collaborated with Lesson Study Learning community that incorporated Plan-Do-See stages, with two cycle. with the subjects under investigation were class XI, students of SMAN 8 Malang. There are 35 students in class, consist of 15 male student and 20 female student. The instrument used to measure the success of the model and student learning outcomes is the observation sheet of teacher and student activities through the Team Games Tournament (TGT) model with the smart batik card media and the test that is playing the game with the smart card media made by the students. The data has been collected, then analyzed descriptively qualitative and quantitative.

The result of the analysis shows: 1) the activity of the students and teachers in the learning model of Team Games Tournament with the smart batik card media in the first cycle of 76% and 91%; and in cycle II increased to 98% and 99%; 2) student learning outcomes by playing games on cycle I obtained percentage of 67% and in cycle II increased to 80%. 3) Some obstacles during the implementation of LSLC were in the schedule arrangement and preparations of LS. 4).The proposed solution to cope with those obstacles included regular coordination and discussion among team members as well as involving the teacher, lecturer and staff.

Keywords: LSLC, Team Games Tournament, TGT, Batik Card
Lesson study and the educational portfolio as complementary methodological strategies initial teacher training-An innovative cooperative university proposal

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On this occasion we would like to share an experience which includes two complementary methodological strategies: Lesson Study (cooperative action research methodology) and the Educational Portfolio (individual learning and assessment strategy) in the Didactics subject, part of the Infant Education Degree at Málaga University (Spain), focusing on what for us is a fundamental goal: creating empathy between future teachers and childhood culture.

The students developed several Lesson Studies (LS) in small groups over the course of the subject. As year-one students generally lack experience with pupils, the objectives for their Lesson Studies were based on the official national curriculum and the content worked on in class. To this end, we believe it is necessary to find a methodological strategy that can lead to deep, personal reflection on childhood, promoting understanding of childhood needs based on their own experience, and encompassing theory, emotions, skills, aptitudes and values.

In this regard, uploading the portfolio to the Mahara (from the Maori word for thinking) online platform made it possible for students to keep a diary on the content and dynamics developed in class. This digital portfolio meant they could express themselves through text, image and video, which implied processes of reconstruction and personal abstraction that helped us to promote critical thinking and overcome repetition of theory. Furthermore, the academic tutors carried out continuous monitoring and feedback, encouraging reflection and remembrance of their own early experiences in order to identify childhood needs and values.

It was from this flow that the objectives for the lesson study appeared, along with a strong desire to break away from the socialising aspects of school and offer pupils an educational experience in accordance with their needs and interests. Students' biggest incentive was to generate a meaningful educational experience for pupils, where they would enjoy learning and want to share it with their families.

Learning environments were created in order to design the Lesson Study, through a methodology that gives pupils autonomy and trusts in their ability to learn in contexts rigorously designed by the teachers. This was a great challenge for their practical knowledge, as they had to play a teaching role that was unknown to them in practice. The table for teachers' actions proposed by the Lesson Study in this process helped them to reach a consensus and describe their actions, as well as highlight their previous conceptions of childhood.

Implementing the Lesson Study allowed the groups to share their joy in seeing how their designs responded to pupils' motivations, while at the same time achieving their objectives for the Lesson Study. Furthermore, it also meant they could contrast their
previous conceptions of childhood (set out in the table for teachers' actions) with their observations in the Lesson Study, revealing a new image of childhood which is autonomous, generous, cooperative, etc. This phase led to a huge range of evidence of the reconstruction of students' practical knowledge, where they seemed to discover a new teaching role and build a new childhood culture.

In conclusion, there is a large body of evidence that leads us to believe that this proposal helped prospective teachers to empathise with pupils' needs and interests, favouring the construction of a new image of childhood and the reconstruction of the traditional teaching role, helping to arouse an incessant flow between knowledge and practical thinking.

**Keywords:** Lesson Study, Portafolio, Initial Teacher Training, Methodological Strategies, Cooperative
Abstract ID: F0496

A wetland as a classroom: An interdisciplinary science course for STEAM education

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Sustainability, for human, society, economy and environment, is receiving significant attention in the current era, when the energy crisis and climate change are endangering our future generations. The technological revolution, which is restructuring the global economy as well as one's everyday life, is the hope for human beings to address the current environmental issues. Science and technology education for our young generation is therefore an increasingly critical investment and innovative learning strategies are needed, more than ever, for them to understand of the past, the present and the future, to face the challenges and to create a bright future.

Innovation to science education should start from redefining the purpose, the scope and the method. Nowadays, it is not only the potential scientists that need to learn science and technology, but every single student that will face the future, using their scientific literacy to understand the constantly changing environment and to address the grand socio-scientific challenges. Meanwhile, focusing on mono-discipline will not be favored for the science education anymore; instead, interdisciplinary science study is required to solve the complex issues.

In the past few years, interdisciplinary STEAM (Science, Technology, Engineering, Arts and Mathematics) education have provided an innovated approach to guide student inquiry, dialogue, and critical thinking, to foster students’ creativity, and to develop holistic education. Subsequent challenges associated with the STEAM education come to educators on how to design the curriculum; and for many high-school teachers, how to widen the academic knowledge has become a difficult but critical problem to be solved. Corporations between experts in higher education and high schools are desperately needed for well-designed and high-speed teacher training program.

Recently, an interdisciplinary science study program for high school students in Beijing is introduced, aiming to develop students’ core competences in science across a wide spectrum of research topics. Conducted in a natural wetland, this study program has jumped out of the traditional classroom and features the following key characteristics:

The courses embed the socio-scientific issues and sustainability education into the natural wetland ecosystem, bringing the live experience to students

The course contents are highly aligned with STEAM education concept, which emphasis on the interdisciplinary study;

The course design is achieved collaboratively by the higher education experts, as well as high secondary school teachers, and it can also be seen as a training program for teachers from different background and disciplinary.

Herein, the curriculum design strategy and the firsthand experience will be shared, with a particular focus on how knowledge can be better delivered in such program and how to take advantage of the natural environment for science education. Also students’ reports and presentations are collected and analyzed as important data to evaluate effects of the course. This course embedded ecological environment into the STEAM education
platform, to fully explore the potentials of the students and to develop their science-related core competencies.

Keywords: STEAM, Interdisciplinary, Science education
Effect of using Co-5 Steps learning process together with peer-to-peer techniques using LS through PLC on mathematic learning achievement of students in grade 9 of Pattaya City 11 School

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The purposes of this research was (1) to study Mathematic Learning achievement of Students in Grade 9 of Pattaya City 11 School after using collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC. (2) to compare pre-test and post-test Mathematic Learning achievement of Students in Grade 9 after using collaborative 5 steps learning process together with Peer-to-Peer Techniques using lesson study through PLC. The target group were 41 students who are studying in grade 9 of Pattaya City 11 School in the 1st Semester of Academic Year 2018. The member of Professional Learning Community, researcher, teacher’s buddy, head of academic department, and academic deputy director participated in all 5 steps, which were (1) Content Analyzing, (2) Planning, (3) Doing and Seeing (4) Reflecting, and (5) Redesigning. The experimental instrument was 3 lesson plan of Collaborative 5 STEPs Learning Process together with peer-to-peer techniques using lesson study through PLC about finding axis X intercepts and axis Y intercepts from a graph. The collected data were analyzed by using average, standard deviation and t-test, qualitative analyzed by content analysis.

The research findings can be summarized as follows:

1. After using Collaborative 5 STEPs Learning Process together with peer-to-peer techniques using lesson study through PLC. Mathematic Learning Achievement of students in Grade 9 was totally average 9.24 and 92.44 percentage.

2. After using Collaborative 5 STEPs Learning Process together with peer-to-peer techniques using lesson study through PLC. Mathematic learning achievement of students in Grade 9 was significantly increased before implementing at .05

After reflection, it was found that effect of using collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC. Students have a quick understanding of the subject, Dare to think self-answers, Have confidence in learning with learning, not stressful and happy learning.

Keywords: Co-5 Steps, Peer-to-Peer, LS through PLC, Mathematic Learning Achievement, Grade 9
Collaborative 5 STEPs learning process together with peer-to-peer techniques using lesson study through PLC on English learning achievement of students in Grade 10

Kamonthip Chansamarn, Pattaya City 11 School, Thailand

The purposes of this research was to study English achievement ability of Grade 10 Students of Pattaya City 11 School after using collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC. The target group was a group of 36 students who are studying in grade 10 of Pattaya City 11 School in the 1st Semester of Academic Year 2018. The member of Professional Learning Community, researcher, teacher’s buddy, head of academic department, and academic deputy director participated in all 5 steps, which were (1) Content Analyzing, (2) Planning, (3) Doing and Seeing (4) Reflecting, and (5) Redesigning. The experimental instrument was 2 lesson plans of collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC about Parts of Speech. The collected data were analyzed by percentages. Qualitative data analyzed by content analysis.

The research findings as follows:

After using collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC. English Learning Achievement of students in Grade 10 Overall, the average score was 82.63 percentages, in very good level.

From the reflection, it was found that the using collaborative 5 steps learning process together with peer-to-peer techniques using lesson study through PLC. English learning achievement of students in Grade 10 was really higher. Students were happy to study English collaboratively. Sharing and caring, excellent learners helped slow learners. Working together which was called collaboration. So Peer-to-Peer technique made students review their knowledge and find the ways to explain to their friends both the knowledge acquisition and the exercises. PLC helped to see how to modify the teaching. Children's learning obviously.

Keywords: Collaborative 5 STEPs, peer-to-peer, Lesson study through PLC, English, Grade 10
Collaborative 5 STEPs learning process together with activity sheet and peer-to-peer techniques using lesson study through PLC on science learning achievement of students in Grade 10

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The purposes of this research were (1) to study Science achievement ability of Students in Grade 10 of Pattaya City 11 School after using collaborative 5 steps learning process together with activity sheet and peer-to-peer techniques using lesson study through PLC. (2) to compare pre-test and post-test Science achievement after using collaborative 5 steps learning process together with activity sheet and peer-to-peer techniques using lesson study through PLC. The target group were 38 students who are studying in grade 10 of Pattaya City 11 School in the 1st Semester of Academic Year 2018. The member of Professional Learning Community, researcher, teacher’s buddy, head of academic department, and academic deputy director participated in all 5 steps, which were (1) Content Analyzing, (2) Planning, (3) Doing and Seeing (4) Reflecting, and (5) Redesigning. The experimental instrument was 3 lesson plan of Co-5 STEPs Learning Process together with activity sheet and peer-to-peer techniques using lesson study through PLC. The collected data were analyzed by using average, standard deviation and t-test, qualitative analyzed by content analysis.

The research findings can be summarized as follows:
1. After using Collaborative 5 STEPs Learning Process together with activity sheet and peer-to-peer techniques using lesson study through PLC. Science Learning Achievement of students in Grade 10 was totally average 15.53 and 77.63 percentages which was in excellent level.

2. After using Collaborative 5 STEPs Learning Process together with activity sheet and peer-to-peer techniques using lesson study through PLC. Science learning achievement of students in Grade 10 was significantly increased before implementing at .05

From reflection and using collaborative 5 steps learning process together with activity sheet and peer-to-peer techniques using lesson study through PLC. It was found that the students were interested in the lesson and they could clearly work collaboratively and they were able to understand about shape of covalent molecules well.

Keywords: Collaborative 5 STEPs, Peer-to-Peer techniques, LS through PLC, Science, Grade 10
Effect of using collaborative 5 Steps learning process together with think pair share technique using lesson study through PLC to enhance English learning achievement of students grade

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The purposes of this research was to study English Learning Achievement of Students Grade 11 of Pattaya City 11 School, after using collaborative 5 steps learning process with think pair share technique using Lesson Study through PLC. The research targets were 42 students who are studying in grade 11 of Pattaya City 11 School in the 1st Semester of Academic Year 2018. The member of Professional Learning Community, researcher, teacher’s buddy, head of academic department, and academic deputy director participated in all 5 steps, which were (1) Analyzing the contents with PLC. (2) Planning the instruction by collaborative 5 steps learning process with think pair share technique by lesson study. (3) Doing and seeing the instruction in the classroom by PLC. (4) Reflection with PLC. (5) Redesigning the lesson plan. The experimental instrumental was 3 collaborative 5 steps learning process lesson plans with think pair share technique by lesson study. Research instrument was objective test on learning English Subject achievement. Collecting data was analyzed by percentage.

The research findings can be summarized as follows:

After using Collaborative 5 Steps Learning Process together with think Pair Share Technique using Lesson Study through PLC. English Learning Achievement of Students Grade 11 of Pattaya City 11 School was 75.63 percentages which was in good level.

After using collaborative 5 steps learning process with think pair share technique, it was able to make the students help grade 11 students of Pattaya City 11 School dare to give expression, be relax, and be happy to help each other when they respond the challenged lesson with teacher. They feel more comfortable and more eager when they do the example and study in the classroom.

Keywords: Collaborative 5 Steps, Think Pair Share Learning Technique, English, PLC, Grade 11
Abstract ID: G0325

The first grade students’ mathematical representation on number up to 10 in classroom using lesson study and open approach

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“Representation” is one of the five broad “Process Standards” included and elaborated in the National Council of Teachers of Mathematics’ (NCTM’s) Principles and Standards for School Mathematics (2000). Let’s think about it from the perspective of the classroom. Representation also includes internalizing or taking in mathematical ideas and understanding (Fennell, 2006) Open Approach is instructional that focuses on problem solving to develop students’ thinking skills and develop their own mathematical knowledge (Inprasitha, 2014) Number up to 10 is the first content of learning in the first grade. So it should be organized learning activities for students to use representation as a tool to support their own mathematical understanding (NCTM, 2000) To provide students with basic knowledge about numbers and can be applied to others content in the future.

The objective of the present research was to study students’ mathematical representation on number up to 10 in classroom using Lesson Study and Open Approach. Target group was 10 students of first grade in 2018 academic year at Ban Ubmung School. Data collection was done by Open Approach instruction based on Inprasitha’s framework (2011; 2014) by using 10 lesson plans of a number up to 10 that designed with Lesson Study team. Lesson Study team consists of 4 in-service teachers, all of them are master student in Mathematics Education Program. The analyzed data using qualitative research methodology with analytic description based on the theoretical framework of representation by Goldin (1998). The empirical data to an analyzed were students’ work pieces, photographs and information from interviews after the classroom activities.

The study results revealed that from the analysis of representations in the context of classroom using Lesson Study and Open Approach, there were students’ mathematical representation in five types: 1) Verbal–syntactic systems, students use narrative to tell the number of objects in the picture, 2) Imagistic systems, students use drawing, painting and circle around the image to grouping the items, 3) Formal notational systems, students writing a numbers to indicate the number of items, 4) A system of planning, monitoring, and executive control, students put a block on pictures by number of items, then put the old blocks on the other things that think of the same number, 5) An affective system, students express themselves in a gesture that represents the count such as counting by one, two.

References


**Keywords:** Lesson Study, Open Approach, Representation
Abstract ID: H0148

Improving the students' skills in solving problems in physics

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Elmira Zakharova, NIS of Physics and Mathematics in Taraz, Kazakhstan

An important part of the science courses in schools is problem solving. Based on the results of a summative and formative assessment in the NIS Physics and Mathematics in Taraz, it was found that 62% of students experience problems in solving physical problems. The following question is posed: "How to improve the students' skills in solving problems in physics?".

Observation showed that out of 8 students in 10th grade, 6 did not solve problem task. Out of these 6 students, 1 student did not solve the problem because he could not apply the formulas studied earlier. The other 5 students chose the wrong way to solve. Only 2 people got the right answer at the end of the task. This leads to the conclusion that the key factor for most students was misunderstanding of the condition of the problem solving task. It was suggested that the most effective method in this case would be the implementation of a meaningful approach in the course of group discussion of the condition and the solution of problems. The main emphasis in this case was to be in a situation in which students could exchange opinions and encourage each other to find the right ways to solve the problem on the basis of the given condition, but everyone could independently determine the ways of their own development. Each time students were divided into different groups, so that one of the participants would act as a guide. The tasks were designed in such a way that the students had to make a detailed analysis of the condition.

The results for each student were processed on the basis of: observation sheets, interviews, comparison of the results of the summative assessment. It shows that all students have progress in problem solving skills from 2.5% to 15%.

Conclusions:

• If students have difficulties with solving problems, there are two key positions: how good the students understand the concept and what the level of student’s problem solving skills is. For this, it is necessary to evaluate the main steps of the solution of the problem, according to the algorithm presented in a more equal way. On the basis of the observation sheet, the main position of the teacher in this matter will be seen.

• In general, there is the problem of a meaningful approach to understanding the condition of the problem. To solve this problem, it is necessary to create environment in which students could exchange opinions and encourage each other to find out the right ways to solve the problem on the basis of the existing condition, but at the same time everyone could independently determine the ways of their own development.

Keywords: Solving problem, Physics, meaningful approach
Teacher training in IBSE strategies using the lesson study model at University of Valladolid (Spain)

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This work shows the role of using Lesson Study model for training pre-service teachers at universities classrooms. The objective of this research the preparation of the future primary teachers in teaching using IBSE (Inquiry Based Science Education) strategies through the application of the Lesson Study (LS) model. This case study shows the experience developed at the School of Education in University of Valladolid (Spain), which has been development as a part of a Teaching Innovation project. The focus of analysis was classroom practices in the subject of “Health Education”.

The methodology, which is clearly qualitative in its approach, is based on the idea of the pre-service teacher (university student) as a researcher. For this and as is typical of the LS model, several phases have been formalized: 1) Definition of the problem and topic, 2) Design of the plan, 3) Development of the research lesson and data collection, 4) Reflection and analysis and 5) Start of a new research cycle. There are two type of participants in the experience: the university teacher and the university students (future primary teachers). The university teacher have three missions: 1) to guide to the different groups, 2) to observe the interventions, and 3) to interview to the students at the end of the cycle. The students is changing their role during the experience, being: 1) student when other classmate teaches “a lesson”, 2) teacher when puts it into practice “a lesson”, and 3) teacher-researcher when plans “a lesson” into a “teacher research group”. All the students work in group and in collaboration during the implementation of the experience that follows a LS model, in order to generate improvements through a constant cycle of reflection-action.

For the experience, which is developed in several sessions, several groups of future teachers are built. Each group design a plan for teaching a different topic of the subject using IBSE strategies. A lesson is planned, observed and evaluated jointly for its redefinition and subsequent implementation into every research-group. All the students have the role of a teacher for one session. The “lesson” takes place through several sessions, in which the students that make up the group participate alternately. In each session, one of the student of every research-group have to teach, and the members of the same group have the role of researchers and they have to observe in order to propose improvements. The rest of the classmates have the role of students, and they are consulted about the development of the practices and those aspects with the aim of achieving improvements.

The data collection techniques have been: classroom observation, analysis of the writing notes by each research-group, and finally, the interview, which is done by the university teacher at the end of the whole experience to the students.

The main results point to the fact that classroom practices allow generating relevant learning among students, because it allows them to build bridges between the theoretical and practical aspects of the subjects and the development of a reflective thought. Also, working collaboratively in the classroom allows to the students develop skills that are
important for the teaching profession in an educational center. The results show the opportunities presented by this methodology for promoting teacher training, particularly reflecting on the teaching profession and the education based on IBSE strategies.

I would like to conclude that students have positively valued the LS model as a way of working IBSE strategies and indicates in a concrete way which aspects should be improved in every student for a later education in the school.

Keywords: Teacher training, Lesson Study model eaching innovations, University teaching innovations, IBSE strategies
The article was written to stimulate discussions about a practice framework of mindful teaching to increase mindfulness and happiness of high school teachers. The framework proposed emphasis five dimensions adopted from Duncan, Coatsworth, and Greenberg’s mindful parenting (2009) which will be trained to the teachers to be applied in teaching. The five dimensions of mindful teaching practice are (1) listening with full attention, (2) nonjudgmental acceptance of self and student, (3) emotional awareness of self and student, (4) self-regulation in the learning interaction, and (5) compassion for self and student. The study is a preliminary of a quasi experiment design which aims to examine the effectiveness of mindful teaching practice in increasing mindfulness and happiness of high school teachers. The study began by identifying mindfulness and happiness of the teachers. The sample consisted of 60 teachers of junior high school and senior high school in Bandung city, Indonesia. The study identified that 60% of the teachers were in the low category of mindfulness and 44% were in the low category of happiness. These findings can be concluded that 60% of teachers were lack of attentive listening, had judgmental acceptance of self and students, lack of emotional awareness of self and students, lack of self-regulation in learning interaction, and lack of affection for self and students. Based on literature reviews and the findings, the authors propose a practice framework of mindful teaching with the purpose of increasing mindfulness and happiness of high school teachers. It is convinced that mindful teaching practice can help teachers cope with their stress in teaching and improve the five dimensions mentioned above as well as can promote the learning process.

Keywords: happiness, learning, mindful, teaching
Abstract ID: H0354

A preliminary exploration of introducing topology into math teaching of primary school

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Objective and Purpose of the Workshop
This workshop looks at experience of children in Grade 3. As they learn more about math, most students develop the idea that math is number, math is mathematical problems and math is formula. This workshop looks at how topology can be introduced into the primary school mathematics class in an interesting way. This approach can cultivate children’s ability to see the world from the perspective of mathematical topology and improve their mathematical literacy.

The workshop introduces two main methods: introducing topology by creating mathematical picture books and conducting scientific experiments to promote problem solving skills.

In the first part, a story is created about two paper clip brothers and two rubber-band sisters working together to rescue a small ant who fall down the drain. This leads to the second stage of developing a topological experiment -- "How do paper clips and rubber bands string together into a long chain?" The children are encouraged to conduct their own experiments. Finally, making use of the story, experimental results and findings, the children create new picture books, and in that process they consolidate and clarify experimental ideas and experience.

In the second part, the concept of Borromean rings is introduced. This is a classic topological structure and the concept is developed using the experimental results. According to the model of observation-hypothesis- experiment-verification-expansion-and-application, the students are able to develop a thorough understanding of the concept.

Applying this practice in the classroom aroused students’ interest. Most of the children believed that although there were no numbers or formulas, they could still solve the problems through observation and reasoning.

Provisional outline of the Workshop

<table>
<thead>
<tr>
<th>Timing (minutes)</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15</td>
<td>Introduction and outline of purpose of workshop</td>
</tr>
<tr>
<td>16-35</td>
<td>Hands-on experiments with paper clips and rubber bands to introduce the logical connections between concepts and allow participants to engage in problem solving as experienced by the children</td>
</tr>
<tr>
<td>36-45</td>
<td>Summary of experimental results and introduction painting books of the children</td>
</tr>
<tr>
<td>46-65</td>
<td>Hands-on experiments about creating Borromean rings and the application of Borromean rings</td>
</tr>
</tbody>
</table>
Presentation of the findings of the children

Questions, Answers and Discussion

**Keywords:** topology, math teaching of primary school, mathematical picture books, scientific experiments, math literacy
Abstract ID: H0380

A case study on drama education and improvisation as a resource of children's everyday creativity

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We are living in an age of knowledge explosion and in this age it is crucial for children to improve their creative abilities. Howard-Jones et al. (2008) highlighted in their study that even a short drama intervention helps children show progression in their attention to and understanding of creative cognition in the classroom. According to Yu-sien Lin (2010), there is little doubt that drama is powerful in fostering creativity, although the relationship between drama and creativity has only recently been made explicit in studies of the impact of drama on creative performance, such as development in creative thinking and problem-solving skills, social skills, and language development. However, these studies are limited to the cause links between drama programs and learners’ creative outcomes. This study, on the other hand, will focus on what kind of creativity is developed and how the creativity is enhanced in drama.

Researchers have made a distinction between “big C” and “little c” creativity. Big C or high creativity delineates extraordinary creativity or genius that results in remarkable achievements and paradigm-shifting impact. However, little c creativity (LCC) or ordinary creativity focuses on the agency of ordinary people and recognizes everyone’s potential to be creative in terms of everyday problem solving. Because of its premise and concerns, LCC is considered more relevant to education (Craft, 2001).

“Improvisation”, is derived from the Latin word, “proviso”. This means to deal with something that is already thought out in advance. Adding “im” to the word, thus making it “improviso” reverses this meaning. “Improviso” then means to deal with things on the spot that are unexpected (Montuori, 2003). Improvisation, therefore, is the process and product of creativity occurring simultaneously (Nooshin, 2003). We believe that drama and improvisation can improve the quality of learning and the quality of life in children education of preschool because drama can be used to extend the worldview of children and deal with difficult situations in a safe environment while analyzing them together (Dickinson & Neelands, 2006).

Caroll (1996) suggested that the case study approach is useful in drama when the researcher is interested in and deeply involved in the structure, processes, and outcomes of a project. In this study, the method of descriptive case study is employed to analyze six-year-old Emily’s enhanced creativity after drama training. To collect the data, the study conducted formal interviews with Emily and her drama teacher, examined the structure, system, mission and drama curriculum that Emily attended. A qualitative analysis approach is employed based on the “interactive model” (Miles & Huberman, 1994). It shows the activity of data collecting and data analysis (including data deduction, data display and conclusions). The findings show that drama and improvisation can improve children’s everyday creativity.

Moreover, concentration, insistence as well as openness play important roles in Emily’s change. During the lessons Emily attends, there are usually three parts——warm-
up activity, main activity and wrap-up activity. The first part which is usually ignored or even skipped by preschool teachers, is always dedicated to the training of concentration. In the process of main activity, it usually needs insistence. For example, when children are not confident enough to imagine what a sheet can be, the teacher may wait and encourage the children to imagine instead of telling her directly or giving up the activity. What’s more, During main activity, children needs to have chance exploring various possibilities in an open environment. In addition, in the wrap-up activity, children require to figure out all kinds of answers to open questions.

Thus, it is suggested that drama and improvisation need to be adopted and that children’s training of these three aspects should be emphasized.

**Keywords:** drama education, improvisation, creativity, teacher, case study
Abstract ID: H0589

The co-teaching between hearing teacher and deaf teacher in inclusive education through lesson study

Hong Zhao, Beijing Normal University, China

Purpose
The purpose of this paper is to report on some teachers in an inclusive kindergarten used lesson study to improve the inclusive education quality. It aims to explore how the deaf teacher and the hearing teacher co-teach, and created impact on these two teachers’ teaching and cooperation.

Design/methodology/approach
An interpretive qualitative study using a case study methodology was employed. Data collected included participant observations and individual interviews. Transcripts of lesson study discussions were open coded for the content of teacher discourse and the sources of influences on the teachers’ reasoning and action.

Findings
The findings indicate that hearing teacher played a leading role in their relationship and the deaf teacher didn’t give enough impact to the students, especially to the deaf of hard of hearing students. And teachers were reconsider the using of sign language and spoken language to face the challenge to adopt the students’ lens in communication.

Originality/value
This study provides an illustrative case on how deaf teacher and hearing teacher teach together at the same time. The study established the importance of an interconnected view of teacher interaction in lesson study that factored in the consideration of the influences at the use of language.

Keywords: Inclusive education, co-teaching, lesson study, deaf or hard of hearing
A longitudinal study of interactive teaching in ETU school

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Haipeng Ci, ETU Tech, China
Yang Hao, ETU Tech, China

Interactive teaching refers to an innovative learning method between teachers and students, as well as students and students, which aims to establish students’ leading role in the teaching process. Studies have shown that interactive teaching can facilitate learning effect at students’ own pace, develop students' creative thinking and cooperation, and also help students to improve their learning habits and abilities. Some researchers pointed out that the implementation of the interactive teaching and its effects depend on the teacher's classroom organizational ability, so it’s not always play a positive role. The depth and breadth of the questions raised by the students are not predictable, and the overall teaching progress cannot be guaranteed. In order to explore the effect of different forms of interactive teaching, we select ETU School, a typical example of innovative schools in Beijing, as an observation pilot, using classroom observation method, to record and analyze the modules and forms of interactive teaching in the classroom of ETU School, such as “question arousing interaction”, “the subject discussion type interaction”, “case teaching”. Three classes in ETU School were selected as subjects for classroom observation (observation records filled by skilled observers) and behavior records (video, audio and teachers' daily text records). At the same time, students' abilities, such as attention, creativity (including divergent thinking & convergent thinking), collaboration and sharing were evaluated by experimental tasks and questionnaires both at the beginning and the end of the semester. In six months of longitudinal tracking, 12000 daily behavioral records of children, 3000 minutes videos and 9000 hours audio data were collected and carried out the following analysis: 1. According to the data of the class observation, we verified several forms of interactive teaching proposed by the predecessors, and summarized the basic modules of the course teaching; 2. Using the word frequency analysis method, we analyze teachers' writing records and the differences in the high frequency vocabulary performance of the classes with various interactive teaching methods; 3. Through the automated screenshot face images in the videos, we get children's real-time emotional states related to the curriculum; 4. Through a professional voice-to-text convention platform, text from real-time audio records were automatically obtained. In this study, we concluded and described many specific teaching examples which attached to interactive teachings. Based on the text records (both recorded by teachers and converted form audio), video records and ability evaluations, the influence of different forms of interactive teachings were compared. And “question arousing interaction” is found to be the most effective way among all kinds of interactive teaching forms.

Keywords: interactive teaching, observation method, behavior record, video record, audio record
Abstract ID: K0352

Investigation on the participation of Hubei High School chemistry teachers in “One Teacher, One Excellent Course” activity

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Xu Sun, Hubei Institute of Education Sciences, China
Quanxin Fu, Yichang No. 1 Senior High School, China

In order to promote teachers to utilize and share digital education resources in the classroom, and to lead the reform of education, the MOE of PRC launched the first program ‘One Teacher, One Excellent Course’ in 2014. The orientation of the program includes: resource utilizing as an aim, resource sharing as a link, focusing on teacher classroom application, innovating the mode and method of education teaching, promoting the deep integration of information technology and education teaching, and expanding the coverage of quality education resources. The Department of Education in Hubei Province responded immediately to the policies of the MOE, and formulated corresponding implementation plans. In 2014-2017, the “One Teacher, One Excellent Course” program had been held in the provincial primary and secondary schools. This study used a three-level stratified sampling to conduct online questionnaire survey of a total of 1474 high school chemistry teachers from 16 cities in Hubei Province to learn about the frequency, form, effects and influencing factors of high school chemistry teachers participating in the “One Teacher, One Excellent Course” activity. It is found that high school chemistry teachers in Hubei join in this activity with various forms as well as a quite high degree of participation, but the proportion, which the teachers participate in different activities, is not balanced. Especially, 66.21% of teachers think that their ability to integrate information technology with classroom teaching has improved greatly after participating the activity. As a result, it is concluded that the annual incomes, professional titles and the highest level of education of teachers have a positive predictive effect on the degree of the activity participation, while with the increase of teaching grades and school levels, teachers' participation in activities tends to decrease.

Keywords: Internet + Education, One Teacher, One Excellent Course, High school chemistry teacher
Abstract ID: K0484

A case study on changes of problems and problems faced by teachers of first-time health and physical education - using the interview as a clue

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In recent years, the high turnover rate of new teachers is a problem in some countries. For example, in the United States, it is reported that 25% of the first-time teachers have left jobs before the third year and nearly 40% have retired within the first 5 years (Milner & Woolfolk Hoy, 2003; National Commission on Teaching and America's Future, 2003). This trend is the same in Japan, and the starting teachers of public schools across the country who have left jobs within a year since adoption tend to be increasing year by year (Ministry of Education, Culture, Sports, Science and Technology 2010).

By the way, at the educational site of today's rapidly changing Japanese, I suffer from the mountain of complex and diverse tasks, and the number of sick leave abruptly depends on mental illness (Ministry of Education, Culture, Sports and Technology 2015). As a factor, Veenman (1984) points out that shifting from teacher training to incumbent teachers at elementary and junior high school is to experience a typical "Reality Shock". Leiter & Maslach (2001) also states that burnout is a long-term response to chronic interpersonal stressors of work. In other words, it can be considered to have problems in the school environment such as the gap between teacher training and faculty teacher transition, colleagues and guardians working in the same workplace.

On the other hand, you can also see the real situation and the problem at the first term of the teacher. For example, Smyth (1995) states that "Initial teachers of physical education are required to have the same responsibilities as 20-year veteran teachers." Many newly appointed physical education teachers are in charge of the same class hours as experienced physical education teachers and in Japan it can be thought that they are deeply engaged in club activities and school administration and it can be said that they exceeded the capacity of young teachers. However, in Japan there are things that studied the problems and troubles of the new teacher for a short period of time in a limited time, but there is no limit as long as there is a trainee who has continuously investigated concrete actual situation.

Therefore, this research aims to continuously investigate the problems and troubles faced by the initial teacher of Health and Physical Education in a year and to clarify the actual situation in a case-by-case manner.

The subjects to be surveyed were 4 initial health professional teachers. In choosing survey cooperators, we selected sex and school type. The interview survey was conducted from May 2014 to April 2015 a total of four times. The interview time was about 30 to 60 minutes for one person, and a semistructured interview (Merriam, 2004) was conducted for the interview with the target person. Also, the contents of the interview were recorded on an IC recorder, text data was created, and analysis method was applied to qualitative data analysis software NVivo 10 and coded text data.
Three points are clarified in the study.

1. Troubles such as "gap with ideal" and "training" precipitated immediately after arrival tend to disappear after the second semester. Also, as the end of the school year, "school work", "class management", and "private" troubles tend to increase.

2. Depending on the background until becoming a teacher and the actual situation of the school of work, the tasks to be held and the troubles tend to be different.

3. There was a tendency to play a diverse and heavy "burden of work" at the school site, especially the role of guidance of club activities and student guidance.

**Keywords:** first-degree health and physical education teacher, assignment, troubles
Abstract ID: K0499

The effect of work-family conflict on work engagement among kindergarten teachers: Mediating effect analysis

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为探讨幼儿园教师工作家庭冲突对工作投入的影响及其心理机制，本研究构建了一个多重中介模型，重点考察情绪调节策略和职业压力的中介作用。以 567 名幼儿园教师为被试，采用工作家庭冲突量表、情绪调节策略量表、幼儿园教师职业压力量表以及工作投入量表调査。结果发现：（1）工作家庭冲突、情绪调节策略、职业压力以及工作投入两两之间存在显著相关；（2）工作家庭冲突不仅可以直接负向预测工作投入，还可以通过认知重评策略、表达抑制策略和职业压力的单独中介作用预测工作投入；（3）工作家庭冲突还可以通过认知重评策略、表达抑制策略→职业压力的中介效应预测幼儿园教师的工作投入。研究进一步揭示了工作家庭冲突与工作投入的关系及心理机制，为解决幼儿园教师工作家庭冲突提供了实证研究，有利于促进幼儿园教师工作投入。

Keywords: Work-family conflict, Emotional regulation strategies, Occupational stress, Work engagement, Kindergarten teachers
Abstract ID: K0512

Dinosaur? Dinosaur! Dinosaur ……: Researches about recognition and maintaining of diverse relationships between child and environment in the colorful-egg museum activities

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Jiajing Xu, *Hubei University of Education, China*
Xueping Wang, *Hubei University of Education, China*
Xiaoxia Li, *Hubei University of Education, China*
Min Chen, *Hubei University of Education, China*

We are interested in the theme as ‘The strategies of designing and promoting the theme activities in the context of Colorful-egg Museum Curriculum which guiding deep learning’, in which we took ‘How to recognize and maintain the diverse relationships between child and environment when one learns deeply’ as the main question. The research methods including but not limited to case study, narrative study and active research.

Data was collected two ways: one is the observation and another is recording. We analyzed the data mainly by qualitative approach, such as sampled typically, focus group interview and learning-story, etc. More precisely, firstly, we captured a very typical deep learning event during our non-participatory observation. Secondly, we asked the tutors to discuss and write a learning-story in which they would make a presupposition what kinds of relationships had been built by the child between he/she and the surroundings in such a situation. After that, the tutors should decide what they should do to help the child to strengthen his/her each relationship with the settings. Thirdly, we interviewed the child and his/her parents in order to verify teacher’s presumption, invited the child and his/her family to continue the learning story, and tested whether the maintaining strategies suitably.

The conclusion is: 1. It is easier for a child to start a deep learning when he explored in a freedom and supportive settings where he will build up three kinds of superior quality of relationships with the surroundings. The first one is a deep interaction with the physics world, in which the child would mobilize all his experiences and energy. The second one is a reciprocal relationship with others who around the child. The third one is an inclusive relationship which will make the child understand himself/herself more. 2. There is a series of condition contribute to a supportive environment which easily to build up diverse relationships, including sufficient time and stretchy schedule, limited members of a group, an opened and stable settings, etc.

Suggestions: 1. Teachers should better arrange a longer free period time and keep their schedules more elastic each day. A child frames his/her own ‘instant-scrip’ autonomously when he/she explores in a freedom environment in order to build up a reasonable relationship. It’s a process which is time-consuming and unpredictable. 2. Teachers better encourage a child actives within a group, even collaborate with one or
two peers as a ‘mini-team’ rather than within the whole class. A ‘mini-team’ would emerge spontaneously in a group when children encountered a difficult task. A child could build up a reciprocal relationship successfully through a ‘mini-team’. 3. The third important thing for teachers is to ask a child to plan for himself/herself before he/her action and to share with peers after action. It will transfer into an implicit and indicative force for a child only if when he/she knows ‘what I do want to do’, which will rouse the child self-conscious acting toward the goals. The sharing after action can give the child an opportunity to rebuild his/her experience and make him/her reflection which will help the child to achieve a balance between self-assertion and self-control. That’s a prelude of an inclusive relationship between the child and himself/herself.

**Keywords:** deep learning, Colorful-egg museum activity, diverse relationship, kindergarten museum curriculum, the whole experience