

theory; twice as; preschool

44 preschool children (6 year olds) participated in the project. The empirical material consists of verbatim transcriptions of three video documented interventions and 132 individual test forms (pre-, post- and delayed post-test). The preschool learning study process analysed in this study has been built up by a joint reflection on the use of contrast of critical aspects related to the intended object of learning. The study suggests that a developed use of contrast of critical aspects of the object of learning seem to have bearing on children's ways of discerning aspects of their surrounding world short- as well as long term. Main principles found seemingly emerging the children's ways of discerning the intended object of learning is discussed in terms of separation, contrast and generalisation. However, the study indicates the need of additional complementary learning study projects to further expand the knowledge of what it means and entails to take critical aspects of the intended object of learning into account when dealing with content focus in preschool educational practice.

E34-PP TR704 Preschool students' understanding of the function of objects and spaces in a number line

*PETTERSSON BERGGREN
Gunilla, BJÖRK Marie,
Sjästadsskolan,
SWEDEN*

Keywords:
Learning Study ; Preschool;
Mathematics; Number line

According to Swedish preschool curriculum, children should develop an understanding of space, shape, position and direction. In this Learning Study we have focused on children's ability to understand the relationship between spaces and objects on a number line. The Number Line is a graphic representation of the number system; it can vary in length, in the number of points or objects, in what parts are being shown or in the distance between the points. The capability to determine where to place numbers or fractions relative to existing numbers on the line is crucial for more advanced mathematics but can be difficult to teach. The object of Learning was defined to be the ability to place items evenly spaced on a given distance. The study was carried out by preschool teachers with a group of four- and five-year-olds at Sjästadsskolan in Stockholm, Sweden. The teachers at Sjästadsskolan, which is both an elementary school and a preschool, have expressed a need for curriculum-based discussions in order to coordinate teaching. Learning Study is used as a model for teachers to do research in their own practice and to develop collective knowledge on teaching and learning. We found it to be crucial for children to realize that the space between the points vary depending on the number of points and the length of the line. They must also understand that the length of the line varies according to the space between the points relative to the number of points. In the third lesson the children showed an independent ability to handle varying distances on the Number Line by first placing five stations along a three meter long railway and then placing ten streetlights along the same railway.

E35-PP TR704 Learning Study projects in Swedish Childhood Education: Possibility and challenge

*TULLGREN Charlotte,
Kristianstad University,
SWEDEN*

Keywords:
Learning study; Pre-school

Traditionally Swedish pre-schools have been awarded full value, where a path of development and education has often been included. School preparatory learning was rarely emphasized (Brembeck, Johansson & Kampmann, 2004). In recent years pre-school has been given a clearer and partially changed mandate related to children's learning and development (Swedish National Agency for Education, 2010). This new tradition of increased focus on learning and goal achievements is challenging for the teachers (Ljung-Djärf & Tullgren, 2010). With this background the aim of the presentation is to give an overview of Swedish Learning Study projects among pre-school children and how these could impact on the teaching and learning in pre-school settings. The presented studies are Learning Studies and consist of two or three micro-

cycle studies. Theoretically they are based upon variation theory and the concepts discernment, simultaneity and variation (Marton & Booth, 1997; Marton & Pang, 2006). When learning it is important for the learners to discern critical aspects of the learning object, discern different aspects simultaneously and what variation and contrast in representation forms. In the studies special focus is put on generative learning (Holmqvist, Gustavsson & Wernberg, 2007) which could be described as the ability to develop knowledge about the learning object beyond the learning situation in the learning study. The studies show that it is possible to accomplish a Learning Study among young children. Learning Study offers the children, and the teachers, to put focus on a certain object of learning. Also more complex and compounded learning objects are possible for the children to gain and develop knowledge about. Learning Study not only enables the teachers to be aware of their own expectations of the children's learning, but also spot the importance of the teachers and the teaching when it comes to the children's learning.

E36-PP TR705

HENDAYANA Sumar (Room Chairperson), YULIANI Yeni,
Universitas Pendidikan
INDONESIA

Keywords:

Strengthening, Chemistry teacher, Community, teaching capacity, lesson study

Strengthening activities of Chemistry teacher community

Strengthening Activities of Chemistry Teacher Community Sumar Hendayana¹⁾ Yeni Siti Yuliani²⁾ Subject-based teacher community as a non-structured organization has been established in Indonesia according to the government regulation No 38/1994. It is expected to improve teaching capacity of teachers at all levels. However, they meet irregularly and activity was limited to prepare lesson plan to be submitted to principal for administrative purposes. Best practice of lesson study has been introduced to strengthen activities of chemistry teacher community in Cimahi city. Regular chemistry teacher meeting was established twice a month to prepare applicable lesson plan, implement it at real class, and reflect it for lesson improvement. Progress of development of chemistry teacher community will be shared.

E37-PP TR705

RAHAYU Sri,
University of Malang,
INDONESIA

Keywords:

hydrocarbon; lesson study; prospective chemistry teachers; practicum

What prospective Chemistry teachers learned from Lesson Study activities: Exemplary case of Chemistry lesson improvements

Practicum is often regarded as the most important component of the prospective teacher education program. In their practicum, the prospective teachers need most guidance on their teaching of subject content effectively, and on their classroom management. So, the prospective teachers need not only to understand the content deeply, but also to know how content is taught and learned. One way to achieve this goal is through involving them in lesson study activities since the lesson study process shows great potential as a mechanism for bridging theory and practice, a method of initiating future teachers into the practice of collaborative planning, teaching, observation and reflection and to give teacher candidates the opportunity to learn from one another, and to think deeply about content and student learning. The study used qualitative research methodology, particularly a single case study of multiple lesson study activities. The inquiry itself called for an exploration which would illuminate the experiences of prospective teachers in teaching high school chemistry topics. The purposes of the study were to explore what prospective chemistry teachers learned from lesson study activities and how they made some improvements on teaching a hydrocarbon topic within the context of their practicum experiences. The role of researcher was as a participant-observer and set up three cycles of lesson study activities on the hydrocarbon topic with six prospective chemistry teachers who took practicum in a public SHS in Malang, Indonesia. Data were collected through videotaping lessons, interviewing prospective teachers, tape-recording de-briefing meetings, collecting field notes from all observers and lesson plans. By triangulating the data, we find that: (1) what the prospective teachers learned