

CURRICULUM DEVELOPMENT AND PROJECTS

MARIANNE ØDEGAARD, for the PISA+group
Dept. of Teacher Education and School Development and
Institute for Educational Research, University of Oslo
marianne.odegaard@ils.uio.no

PISA+: A research project to pursue problematic PISA findings in the Norwegian context

PISA + is a research project on learning and teaching strategies in schools. (+: *Prosjekt om Læringss- og Undervisnings-Strategier i Skolen*). Both mathematics and reading are included in addition to science. It is a qualitative, in-depth study, which tries to scrutinize and understand the results from the past PISA studies (*Programme for International Student Assessment*) (Kjaernsli, Lie, Olsen, Roe & Turmo 2004; Lie, Kjarnsli, Roe & Turmo 2001) and evaluation studies of Norwegian schools (Klette, 2003; Schmidt et al. 1996). It is based on sociocultural principles from theorists such as Vygotsky (1934) and Bakhtin (1981). The methodology is influenced by the Norwegian evaluation study of Reform 97 (Klette, 2003), and the international project The Learner's Perspective Study (Clarke, 2002). PISA+ is partly associated with LPS. Hopefully our results may offer some knowledge valuable for improving learning in schools.

The project's overall research questions are:

- How can we understand and interpret the general achievement level and patterns in the Norwegian PISA results?
- How can we understand the pedagogical processes that shape this reality?
- How can we transform some of the PISA findings into concrete suggestions for improving Norwegian education in the perspective of life-long learning?

Interesting areas that are disclosed by PISA are; that the Norwegian students' achievement within all three subject domains (reading, mathematics, and science) turned out to be near the OECD average; that there is a relatively high spread in student achievement; that the vast gender difference in reading literacy is in favour of girls, actually the very highest internationally; that there is a particularly narrow repertoire of learning strategies; and that according to reports from both students and principals, there is a low level of pressure to achieve, and high level of noise and disorder.

The focus of PISA+ is to study offered learning activities (actions) and experienced learning activities (meaning), and the research design is a classroom video study with observations and interviews of students and teachers.

Our project, gives an interesting opportunity to study meaning making in Norwegian classrooms. Usually activities, organization and content knowledge are studied separately, but in this study we attempt to bring together the three aspects by videotaping the same class in science, mathematics and Norwegian.

PISA+ is a qualitative classroom study with in-depth, fine-grained, investigations that enable us to locate organisational spaces, tasks, activities and values connected to concrete classrooms and concrete procedures and techniques – in short we have robust data of practices taking place at a concrete level.

*Table 1. Number of digitalised video recordings of lessons. (*Work session is a session of 1-3 school lessons where the students work individually with assignments from a work plan. The students chose themselves which subject to focus on. Teachers are available for questions and guidance.)*

	Math	Science	Norwegian	Work session*	
School 1	3	1	3	1	
School 2	8	9	9	1	
School 3	7	11	6		
School 4	10	3	9	6	
School 5	7	16	8		
School 6	4	5	9	2	
	37	45	44	10	n = 136

Our primary sources of informants are grade 9 science classrooms at lower secondary level. The students are 14 – 15 years old. The study includes 6 classes at 6 different schools. The schools are selected so they provide us with a maximum of variations. Demography and pedagogical organizational structure are the most important dimensions of variation. Each class is observed for three weeks. The data collection period covers almost one full year.

The data is collected by video, observations and interviews. We have used three cameras; one following the teacher; one over-viewing the classroom; and one focusing on a small group of students. In addition, focused and purposive interviews with students and the observed teachers have been conducted. The informants are given opportunity to comment on the lesson videos. Each lesson is followed by a students' interview, with different students for each lesson. The teachers are interviewed about one selected lesson a week.

For the quantitative analysis of the videos we use the program *Videograph*. *Atlas* will be used for qualitative analysis of the videos and interviews in a later phase of the project. The PISA+ project is quite comprehensive with a huge database of video material. (see table 1)

The software Videograph (Rimmele, 2002) is a program for playing and analysing digitised video recordings. The program facilitates the construction of observation schemes and rating scales to systematically analyse the instructional events on different levels. It gives quantitative information and provides a visual image of each lesson. The picture in figure 1 shows the screen shot during an "analysing session".

The three main categories used in our general analysis, have a focus on the teacher. They are; whole class instruction; teachers' activities during individual seatwork; teachers' activities during group work. Each category is subdivided into several codes. For additional information on more categories and codes, see Klette et al. (2005). These three categories are mutually exclusive.

The PISA+ research group consists of several researchers with diverse backgrounds; coming from science education, general education, math education and mother tongue education. It is an eclectic group, working with the same material, bringing together different theoretical backgrounds and research traditions. Methods are chosen pragmatically in order to meet common purposes. Johnson and Onwuegbuzie (2004) describe this as *Mixed methods research design* (see figure 2) and state:

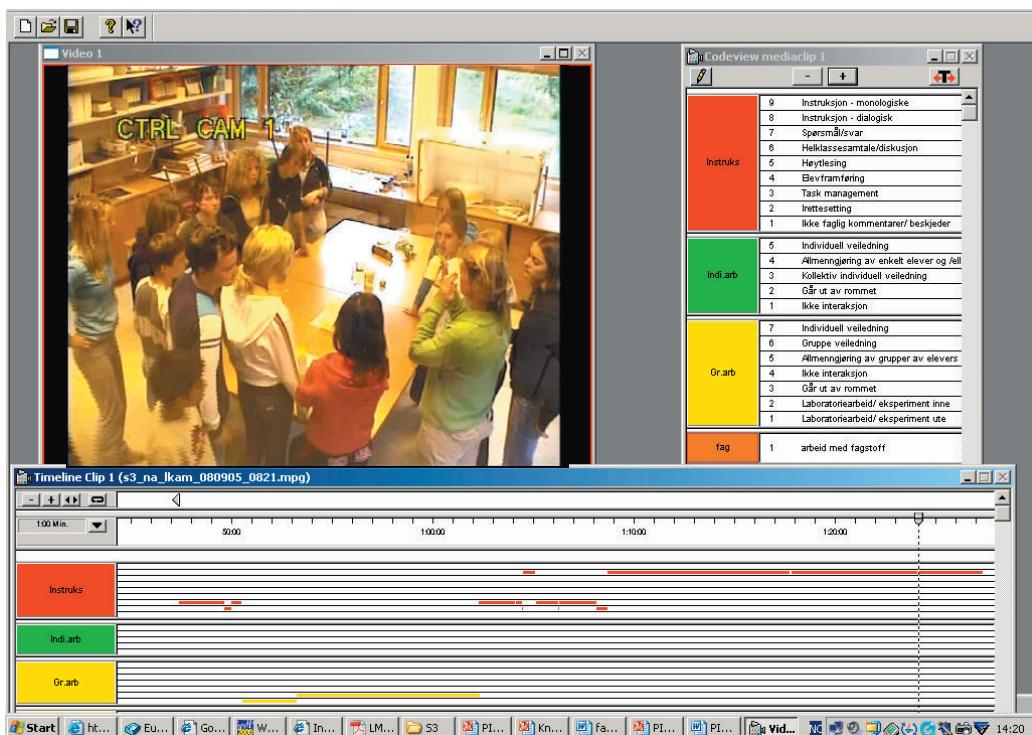


Figure 1. A screen shot of an analysing session using Videograph.

Today's research world is becoming increasingly interdisciplinary, complex, and dynamic; therefore, many researchers need to complement one method with another, and all researchers need a solid understanding of multiple methods used by other scholars to facilitate communication, to promote collaboration, and provide superior research. (p. 15)

As according to figure 2, we have collected the qualitative data and are now performing the first quantitative analysis of the data across all subjects, using Videograph. In this way we will be able to compare science, math and Norwegian lessons, see whether we find special profiles of teaching strategies for the different subjects, and give an overview of teaching strategies at the activity and organisational level in ninth grade classrooms.

After the quantitative analysis we will use this information together with other observations, information from earlier studies and educational insight to do qualitative analysis closer related to each subject; science, math, and reading. Also teachers' mode of guiding students and new teaching tools; as work plans and work sessions, will be explored. Both the teachers' and the students' perspective are given attention.

Participants:

PISA+ involves the following researchers: Prof. Kirsti Klette (project leader), Prof. Svein Lie, Prof. Doris Jorde, Researcher Astrid Roe, Post.doc. Marianne Ødegaard, PhD students Øistein Anmarkrud, Nina E. Arnesen, Ole Kristian Bergem and Jo-Rasmus Zachariassen.

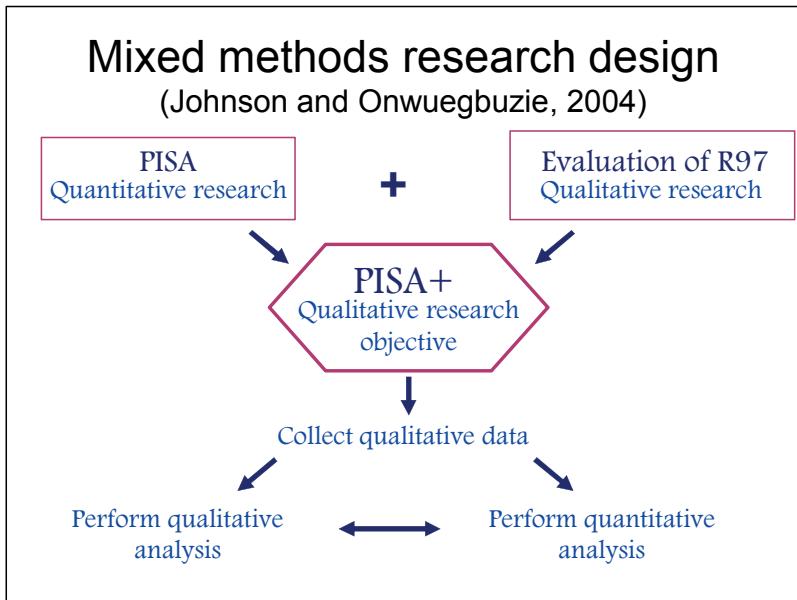


Figure 2. PISA+ has a mixed methods research design (Johnson and Onwuegbuzie, 2004)

References

- Bakhtin, M.M. (1981). *The dialogic imagination: Four essays by M.M. Bakhtin*, M. Holquist, (Ed.) C. Emerson and M. Holquist, (Trans.). Austin: University of Texas Press.
- Clarke, D.J. (2002). The Learner's Perspective Study: Methodology as the Enactment of a Theory of Practice. Paper presented at the interactive symposium 'International Perspectives on Mathematics Classrooms' at the Annual Meeting of the American Educational Research Association, New Orleans, April, 2002. http://extranet.edfac.unimelb.edu.au/DSME/lps/assets/AERA_Clarke_Method.pdf
- Johnson, R.B. & Onwuegbuzie, J. (2004). Mixed Methods Research: A Research Paradigm Whose Time has Come. *Educational Researcher*. 33, 14-26.
- Kjærnsli, M., Lie, S., Olsen, R.V., Roe, A. og Turmo, A. (2004). *Rett spor eller ville veier? Norske elevers prestasjoner i matematikk, naturfag og lesing i PISA 2003*. Oslo: Universitetsforlaget.
- Klette K. (2003). Classroom Practice: Interactions and activities in Norwegian classrooms after Reform 97. (Lærernes klasseromarbeid: Interaksjon og arbeidsmåter norske klasserom etter Reform 97). In K. Klette: Classroom teaching practice after Reform 97 (*Klasserommets praksisformer etter Reform 97*). Oslo: Unipub
- Klette, K., Lie, S., Anmarkrud, Ø., Arnesen, N., Bergem, O.K., Ødegaard, M. & Zachariassen, J.R., (2005) *Categories for video analysis of classroom activities with a focus on the teacher*. Oslo: University of Oslo.
- Lie, Svein, Kjærnsli, M., Roe, A., Turmo, A., (2001). Norwegian PISA report. (*Godt rustet for framtida? Norske 15-åringers kompetanse i lesing og realfag i et internasjonalt perspektiv*). Acta Didactica, 4:2001, University of Oslo.
- Rimmele, R. (2002). Videograph. Multimedia-Player zur Kodierung von Videos. Kiel: IPN
- Schmidt, W., Jorde, D., Cogan, L.S., Barrier, E., Gonzalo, I., Moser, U., Shimizu, K., Sawada, T., Valverde, G.A., McKnight, C., Prawat, R.S., Wiley, D.E., Raizen, S.A., Britton, E.D., Wolfe, R.G. (1996). *Characterizing Pedagogical Flow. An Investigation of Mathematics and Science Teaching in Six Countries*. Dordrecht: Kluwer Academic Publishers.
- Vygotsky, L.S. (1934) Thinking and speech. In R.W. Rieber and A.S. Carton (eds): *The Collected Works of L.S.Vygotsky*. New York: Plenum Press (1987).