



UBIKO

inspiring learning

TOWARDS A KNOWLEDGEABLE,
INSPIRED AND SKILFUL LEARNER

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DIALOGUE BETWEEN RESEARCH AND
DEVELOPMENT IN THE UBIKO UNIT

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TOWARDS A KNOWLEDGEABLE, INSPIRED AND SKILFUL LEARNER – DIALOGUE BETWEEN RESEARCH AND DEVELOPMENT IN THE UBIKO UNIT

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The significance of learning skills and pupils' active knowledge building for learning has been known for decades. Present research knowledge suggests that enterprising and responsible pupils with intrinsic motivation achieve the best results. Learning skills and the will to learn are also considered to constitute wellbeing in our constantly changing environment. The research results described above steered the planning of the development project "UBIKO – School unit as an inspiring pedagogical space that fosters learning" that launched at the Oulu University Teacher Training School in June 2011 with funding from the Finnish National Board of Education. The project aims to reform the practices of the school in a manner that promotes knowledgeable, inspiring and skilful learning. During the academic year 2012–2013 empirical data was gathered about the school activities to be utilised in assessing how well the project objectives were achieved and as research material in itself. This article presents the theoretical background and research setting of the UBIKO project and the concurrent action research. The results will be published in a subsequent doctoral dissertation. The research focused on the pupils (n=97, aged 10–12) and teachers (n=6) involved with the project.

Keywords: self-regulated learning, motivation, learning strategy, learning to learn, teaching profession, learning

INTRODUCTION

The regulation of human activities has been studied in numerous fields. In the last few decades, several theoretical models of the cognitive, metacognitive and motivational processes that constitute self-regulated learning have been produced in the fields of psychology and the educational sciences (Boekaerts & Niemivirta, 2000; Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000). Research into self-regulated learning has usually focused on motivation, the use of cognitive strategies, and metacognitive abilities (Wolters, 2003). In the 2000s the focus of the research has shifted towards authentic learning situations. In terms of methodology, these developments have led to

more versatile data collection methods and the utilisation of data acquired with different methods (Boekaerts & Corno, 2005).

Despite research data about a link between self-regulated learning and good learning achievements being available for some time (Zimmerman & Bandura, 1994), the level of self-direction and learning skills demonstrated at Finnish schools is insufficient. In an extensive assessment report commissioned by the Finnish National Board of Education, Lipponen (2012, pp. 56–57), for example, states that “Based on this assessment it would appear that pupils need more experience and practice with self-direction and learning to learn.” Dignath-van Ewijk and van der Werf (2012) have studied Dutch teachers’ knowledge of and attitudes toward the promotion of self-regulated learning. The results indicate that teachers can enable self-regulation by creating learning situations that are in alignment with the constructivist view of learning, but that they do not foster the improvement of pupils’ learning skills. Teacher training must pay attention to teachers’ ability and will to support the development of pupils’ self-regulation in their work (Dignath-van Ewijk & van der Werf, 2012). According to Perry, Hutchinson and Thauberger (2008) teachers are uncertain whether they can foster self-regulation successfully, which may lead them to favour familiar teaching practices (Kramarski & Michalsky, 2009). In the Finnish teacher education system teacher training schools are a key factor in reinforcing trainee teachers’ feelings of self-efficacy and in determining the beliefs with which new teachers begin their careers. Attitudes formed during teacher education significantly affect the theory-in-use that grows after graduation, as well as future teaching practices (Cady, Meier & Lubinski, 2006; Dignath-van Ewijk & van der Werf, 2012).

In terms of developing schools, it is important to note that researchers gain better development-related results than teachers in research interventions dealing with self-regulated learning (Dignath, Buettner & Langfeldt, 2008). In the action research discussed in this article the aim was to improve teachers’ opportunities to support self-regulation through close collaboration between teachers and the researcher. The research coordinator of the UBIKO project was a teacher at the teacher training school. The research data also allows for a more extensive assessment of the feasibility of the operational model in terms of developing schools.

THE DEVELOPMENT OF THE THEORY OF SELF-REGULATED LEARNING

To rephrase Zimmerman and Schunk (2011), in the 1960s and 1970s research focused on learning processes and key topics included cognitive and metacognitive phenomena. Studies showed that learning cognitive strategies improved academic achievement. However, the skills thus learned were largely not transferred to new situations. In the meantime, the study of behavioural processes focused on readily visible work-related problems, such as hyperactivity and restlessness. The lack of self-control hampered starting and finishing tasks. Researchers searched for remedies by motivating the learners with such means as intrinsic rewards and penalties (Jackson & von Zoost, 1972). Self-regulation research also investigated the effect of concrete rewards on the development of self-regulation. The results revealed that delaying the reward that promoted self-regulation reinforced the learners’ will to achieve their goal (Mischel, 1961; Mischel & Metzner, 1962).

In the 1980s, Brown, Bransford, Ferrara and Campione (1983) observed that talking out loud while working facilitated the use of learned cognitive strategies in new situations. In the case of self-directed learning, however, the learners were not cognizant of their study methods or did not utilise efficient learning strategies. New information about the significance of learners' internal processes led researchers to expand their research focus, particularly in the field of motivation (Zimmerman & Pons, 1986).

In the 1980s and 1990s self-regulation research focused on social and motivational processes and showed that social learning contributed to learners' strategic work (Bandura & Schunk, 1981). Similarly, learner self-efficacy was demonstrated to affect interest (Bandura & Schunk, 1981), task choice (Zimmerman & Kitsantas, 1997) and persistence (Schunk, 1984; Zimmerman & Ringle, 1981). Bandura (1986) observed that self-regulation is a cyclical process comprised of three phases. Self-observation generates information that supports goal-setting and the assessment of progress. In the judgment phase learners consider the adequacy of their actions compared to the standards they have set. In the self-reaction phase learners amend their thoughts and actions based on how well they perceive to have performed. Due to its cyclic nature this process has a clear effect on subsequent self-regulation cycles.

According to Zimmerman and Schunk (2011), self-regulation research in its current form that integrates prior research trends began with Zimmerman's presentation at the annual meeting of the American Educational Research Association in 1986 (Zimmerman, 1986a). He defined self-regulated learners as metacognitively, motivationally and behaviourally active participants in their own learning process (Zimmerman, 1986b). For the past ten years research in the field has increasingly focused on the regulation of motivation, volition and emotions (Wolters, 2003; Boekaerts & Corno, 2005; Järvenoja, 2010). Hadwin, Järvelä and Miller (2011) emphasise the significance of social situations for fostering individual self-regulation skills.

Pintrich (2000) defines self-regulated learning an active, constructive process whereby learners set goals for their learning, guided by themselves and their environment. During this process learners strive to knowingly and purposefully monitor, regulate and control their cognition, motivation and behaviour (Järvenoja & Järvelä, 2006; Pintrich, 2000; Wolters, 2003). Self-regulation is goal-oriented regulation of cognition, motivation and emotion (Salovaara, 2006; Wolters, 2003). At best, self-regulated learners have a strong belief in their abilities, strive to improve their competence (Pintrich, 2000; Schunk & Ertmer, 2000; Wolters, 2003) and utilise a wide range of rehearsal, elaborational and organisational cognitive strategies suited for various learning situations and assignments (Alexander, Graham & Harris, 1998; Weinstein & Mayer, 1986). Self-regulated learning is enabled by the learners' metacognitive activities as they monitor and become aware of their actions (Butler & Winne, 1995). In other words, self-regulated learning is conscious and deliberate planning, monitoring and evaluating of one's own actions. Research has provided strong evidence of self-regulated learning having a positive effect on learning achievements (Paris & Paris, 2001; Winne, 1995; Zimmerman, 1990).

METHODS FOR STUDYING SELF-REGULATED LEARNING

Self-regulated learning research utilises both quantitative and qualitative methods.

Boekaerts and Corno (2005) describe how understanding of self-regulation has affected the choice of research methods. Before the 1990s, self-regulation was seen as a stable characteristic of the individual that does not change with the environment or different learning situations. At that time the most frequently used methods included various questionnaires and structured interviews designed to determine the efficiency and usage of cognitive and metacognitive strategies (Boekaerts & Corno, 2005).

With new research knowledge it was understood that self-regulation changes with both the topic and learning situation in question. One of the most frequently used tools for studying self-regulation is the Motivated Strategies for Learning Questionnaire (MSLQ) published in 1993 (Pintrich, Smith, Garcia & McKeachie, 1993), which is used for gathering information on how individuals use cognitive, metacognitive and motivational strategies. Despite having been developed in 1986–1993 for studying self-regulation among college students, it is still used very extensively. Its reliability in terms of studying primary school children is considered to be good as well (Taylor, 2012).

At present, self-regulated learning is seen as a dynamic process that develops through social interaction. Research focuses increasingly on authentic learning situations where the self-regulation process is studied during its development (Boekaerts & Corno, 2005). Researchers have developed a number of methods for gathering data in the course of learning situations, including observation (e.g., Perry & Rahim, 2011), thinking aloud (e.g., Greene, Robertson & Croker-Costa, 2011) and gathering trace data about studying (Winne, 2006). The benefits of using a diary in data collection include its effects on the learners' self-monitoring, which allows it to support the development of self-regulation (Schmitz, Klug & Schmidt, 2011). Diaries enable collecting data during the learning process, which allows researchers to study the development of learning and its contributing factors afterwards (Schmitz, 2006). This way diaries facilitate the analysis of data derived from starting level and final measurements (Schmitz et al., 2011).

RESEARCHING SELF-REGULATED LEARNING IN THE UBIKO PROJECT

The UBIKO project (14 June 2011 – 31 December 2013) was launched in June 2011 with funding from the Finnish National Board of Education with the aim to reform the infrastructure and operational culture of the school in ways that foster knowledgeable, skilful and inspiring learning. In the original project proposal this goal was to be achieved by developing the curriculum, the assessment of learning and self-regulated learning, as well as teamwork between teachers. Self-regulated learning is both the research focus of the project and the theoretical background steering the related activities and development work (Boekaerts, Pintrich & Zeidner, 2005; Schunk & Zimmerman, 2008).

The operational environment of the UBIKO project is the school unit comprising five classrooms and the shared school unit proper, which joins the classrooms together. The project concentrates on

all third- and fourth-grade pupils enrolled at the school during academic year 2011–2012, as well as their teachers. This means that one class involved with the project worked physically outside the UBIKO unit. In total, the project participants comprised 111 pupils, six teachers and one project manager. The teachers and the project manager in charge of conducting the research formed the UBIKO team, which coordinated the project activities. As teacher training is a part of the operation of the school, class teacher trainees participated in the development work during their traineeships.

In spring 2012, University Properties of Finland, Ltd. and Martela, Ltd. provided an opportunity to expand the UBIKO project to cover the development of and research into the physical learning environment as well. Appendix 1 presents an image of the UBIKO learning environment designed by the teachers and architect Heikki Luminen. Key properties of the facilities in terms of the project include flexibility, versatility and comfort. The facilities provide excellent physical means for developing self-regulated learning. Structural changes were implemented and new furnishings acquired in summer and autumn 2012. The significance of the changes to the physical learning environment, as well as the design process itself, are studied in a separate project.

Objectives for the first year of the project included operational planning and piloting. Challenges faced during that time included introducing mobile devices (20 iPods and 40 iPads) and developing operational models for utilising them in teaching.

A total of four subproject periods of 5–6 weeks each were organised during academic year 2012–2013. Each period focused on specific project objectives as agreed upon by the UBIKO team (see Table 1). After each period the completed activities were assessed, and these experiences were used to determine objectives and activities for the next period. Research material was collected from teachers, pupils and trainee teachers during each period.

Table 1. Key objectives for the UBIKO subproject periods

PERIOD	PEDAGOGICAL OBJECTIVES FOR THE PERIOD	THEORETICAL GROUNDS FOR ACTIVITIES FROM THE PERSPECTIVE OF SELF-REGULATED LEARNING
<p>UBIKO 1</p> <p>6 weeks</p> <p>Time:</p> <p>3. September – 12 October 2012</p>	<p>An operational model for implementing phenomenon-based, multidisciplinary and integrative learning modules while simultaneously developing thinking and working skills was tested during this period. Activities were designed to support collaboration between classes and the dialogic sharing of expertise among teachers.</p>	<p>Puustinen & Pulkkinen (2001) have compared key models of self-regulated learning, proposing that each model includes three phases, namely, preparation, performance and reflection. During the first period, observations were made about the overall self-regulation process by implementing a pedagogical model that enabled the actualisation of all aforementioned phases. The pedagogical model was structured as follows:</p> <ol style="list-style-type: none"> 1. Creating a context 2. Ensuring appropriate knowledge base 3. Hands-on work 4. Deepening one's understanding 5. Summary

<p>UBIKO 2</p> <p>6 weeks</p> <p>Time: 29 October – 7 December 2012</p>	<p>This period focused on supporting individual learning processes, thus improving learning motivation and metacognitive skills. The classes worked independently, but special attention was paid to developing collaboration between teachers, i.e., the UBIKO team.</p>	<p>The work focused on developing goal-setting, monitoring and revision in pupils. One underlying assumption common to models of self-regulated learning is that regulation that directs learning is based on goals or operational criteria determined by the learner independently (Wolters, 2010).</p>
<p>UBIKO 3</p> <p>6 weeks</p> <p>Time: 21 January – 1 March 2013</p>	<p>Learning to learn was developed as part of studying subject contents. All classes worked independently, but teachers collaborated in the UBIKO team. The use of strategies and tactics was rehearsed with the help of a Finnish-language summary of the book “Developing self-regulated learners: beyond achievement to self-efficacy” (Zimmerman, Bonner & Kovach, 1996).</p>	<p>Teachers were requested to use direct advice and models for developing self-regulation. According to research, learning to learn has not been supported sufficiently (De Kock, Slegers & Voeten, 2005; Dignath-van Ewijk & van der Werf, 2012; Lipponen, 2012).</p> <p>Studies have indicated that primary school children respond better to direct instruction than indirect methods designed to foster self-regulation (Moos & Ringdal, 2012).</p>

<p>UBIKO 4</p> <p>5 weeks</p> <p>Time: 25 March – 26 April 2013</p>	<p>Individual learning processes and self-monitoring were rehearsed through long-term project work. Particular attention was paid to changes in the teacher’s role in the teaching event and to finding assessment practices that would support the individual learning process. During UBIKO 2 and 3 goal-setting and learning strategies were rehearsed as separate skills contributing to self-regulation.</p>	<p>The final period aimed to reinforce and integrate the self-regulation methods practiced during the year into a conglomerate process, as well as to create operational principles based on theoretical knowledge (Perry, Hutchinson & Thauberger, 2007; Perry & Rahim, 2011) and experiences that were later summarised as classroom rules. These principles steered the activities of the class throughout the period. (Appendix 2.)</p>
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RESEARCH SETTING AND PROBLEMS

This study is a qualitative action research project in which the researcher has a dual role as both the researcher and the project manager of the UBIKO project, which generates research material. Figure 1 illustrates the research setting.

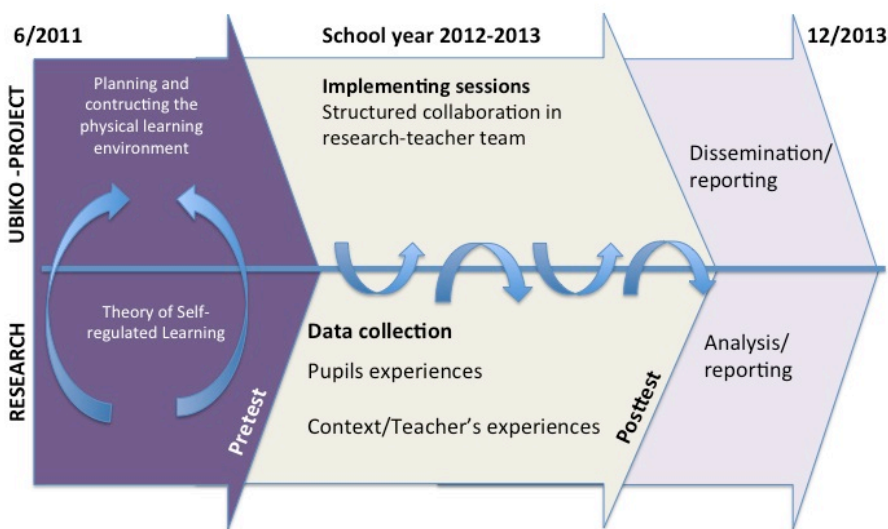


Figure 1. Research setting – interaction between research and the UBIKO project

The UBIKO project implemented at the Oulu University Teacher Training School is an empirical study of the expression and development of self-regulated learning during academic year 2012–2013. It is a simultaneous analysis of both teachers’ and trainee teachers’ reported experiences of fostering the development of self-regulated learning and its contributing factors. The research focused on the pupils (n=97) and teachers (n=6) involved with the project.

The key research questions include:

1. How does self-regulated learning in fourth- and fifth-graders change during the UBIKO project?
2. Which factors in the operational environment of the project support the emergence of self-regulated learning?

GATHERING RESEARCH MATERIAL

Research material was gathered as part of routine project activities in the course of academic year 2012–2013. The material acquisition process is illustrated in Figure 2.

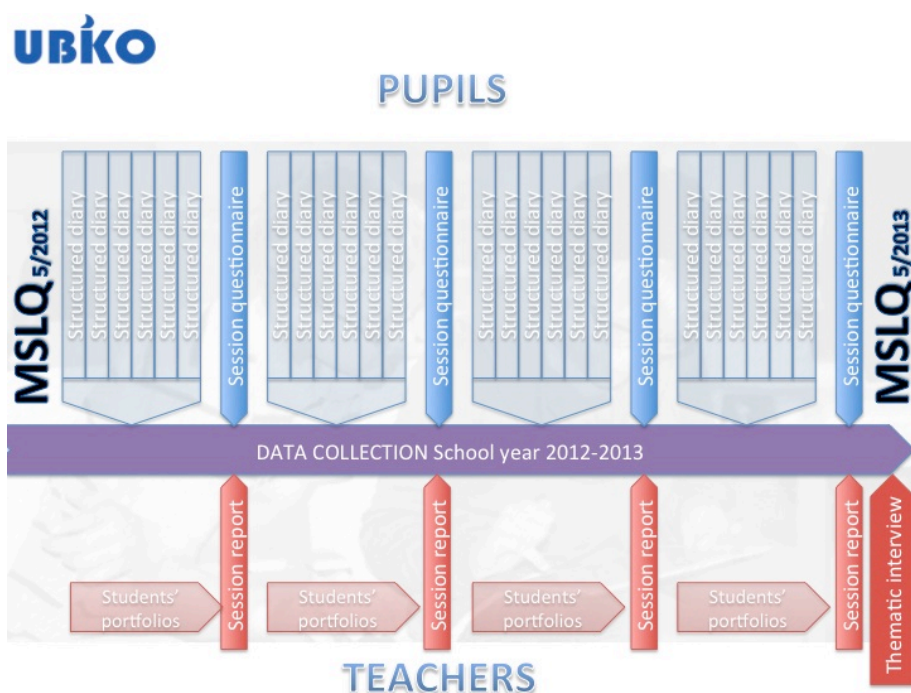


Figure 2. Gathering research material as part of the UBIKO project.

Starting level and final measurements

Before the intervention (5/2012), class teachers had their pupils respond to two questionnaires based on the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Paul Pintrich’s research team in the 1990s (Pintrich et al., 1993). MSLQ is a 7-point Likert scale questionnaire. Questions pertaining to the use of learning strategies were direct translations of the original text, but

a total of twenty questions pertaining to regulating motivation and emotion were added to the motivation section. The questions on regulating motivation were based on the article “Regulation of Motivation: Evaluating an Underemphasized Aspect of Self-Regulated Learning” by Wolters (2003). A variance analysis of the MSLQ allows for analysing changes in the orientation of self-regulation, but the questionnaire can also be exploited when dividing the respondents into qualitative categories. The questionnaire was completed again after the subproject periods (5/2013).

Structured diaries

In order to interpret the variance analysis results of the starting level and final measurements, data was gathered in the course of the work as well. The data collection aimed for temporal proximity between the learning situation and the completion of the diary without jeopardizing the integration of the data collection into the regular activities of the class (Schmitz et al., 2011) During the subproject periods the pupils answered a questionnaire compiled by the researcher on a weekly basis. The questionnaire took the form of a structured weekly diary with questions about work completed in the past week (Appendix 3). Class teachers chose the appropriate technical means for responding to the questionnaire. Some classes used a form in the Google Drive environment, while others integrated the questions into the Edmodo platform, which was already familiar to the class. The researcher could then extract the responses from Edmodo. One class mainly used printed forms. A total of 1219 responses to the weekly diaries were generated during the study (averaging 12,6 responses per pupil). There were considerable differences in the number of responses submitted by different classes, ranging from 17,8 to 4,7 responses per pupil. After each of the four periods the researcher had the pupils complete a diary in hard copy, containing three questions on self-regulation (Appendix 3). A total of 380 (avg. 3,9 per pupil) period-specific diary responses were submitted. In addition to generating research material, the questions aimed to provide indirect support for the development of self-regulated learning by urging the pupils to reflect on their work after completing their activities (Kistner et al., 2010; Schmitz et al., 2011)

After each period, teachers provided class-specific reports outlining the practical methods used for achieving the objectives of the period. Since the periods coincided with teacher traineeship periods, the pedagogical portfolios compiled by the students regarding their traineeships provide additional information about the work completed and issues perceived as important in each class. A total of 31 students allowed their pedagogical portfolios to be used for research purposes. At the end of the academic year 2012–2013 all the teachers responded to themed interviews about learning in their respective class, their teaching profession, factors affecting the completion of UBIKO-related duties, their work in the UBIKO project, and their experiences of it. A total of five hours and forty-five minutes of interview data (a total of 76 transcribed pages with line spacing at 1,15) was acquired.

S U M M A R Y

This article described the UBIKO project currently in progress at the primary school section of the Oulu University Teacher Training School, as well as the theoretical background and research premises of the related action research. The first part of the article outlined the development of the theory of self-regulated learning, which forms the theoretical background of the project, as well as related

research methods developed in the past fifty years (Zimmerman & Schunk, 2011). Although the link between self-regulation and academic achievement has been demonstrated, schools cannot yet fully utilise this knowledge. Research suggests that teachers need support for changing their practices (Dignath-van Ewijk & van der Werf, 2012). Methodologically, research on self-regulated learning has increasingly shifted towards authentic learning situations (Boekaerts & Corno, 2005).

The presentation of the theory demonstrates the topicality of this action research. The UBIKO project strives to rise to challenges arisen from previous studies through collaboration between teachers and the researcher. Long-term, cyclical research and development implemented in an authentic school environment provides valuable new information on how a technologically advanced, flexible learning environment affects self-regulated learning and which factors in the everyday operation of the school support pedagogical activities that foster the development of self-regulated learning. In addition, the classes involved with the study form a community comparable to a small school, which may bring forward issues pertaining to the school culture as a whole. The wide range of material gathered in the course of this study provides an opportunity to analyse both teachers' and pupils' points of view.

APPENDIX 1. 3D IMAGE OF THE UBIKO UNIT. ARCHITECT HEIKKI LUMINEN, LUMISET OY (LTD.)



ARCHITECT OFFICE **lumiset**
Normaalikoulu, Oulu
8.6.2012
Heikki Luminen

APPENDIX 2. CLASSROOM RULES

I Teacher's Boad

1. I ensure students have the domain and strategy knowledge they need to work independently
2. I help pupils to make appropriate choices
3. I encourage pupils to expand their developing abilities by attempting challenging tasks
4. I use non-threatening evaluation practices that emphasize personal progress
5. I encourage students to interpret errors as opportunities to learn.

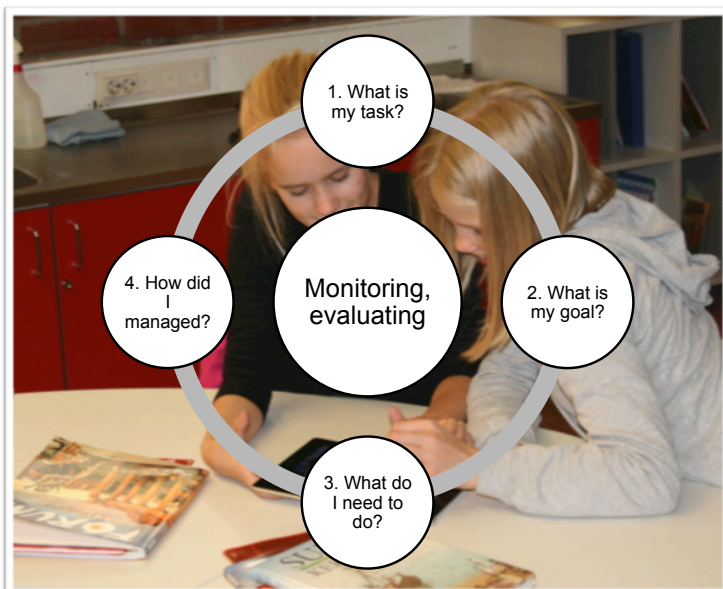
(Perry, N. E., Hutchinson, L., & Thauberger, C. (2007). Mentoring Student Teachers to Design and Implement Literacy Tasks that Support Self-Regulated Reading and Writing. *Reading & Writing Quarterly*, 23(1), 27–50. doi:10.1080/10573560600837636)

II Pupil's rights

6. Pupil's have opportunities to engage in complex, meaningful activities that extend over multiple sessions
7. Pupil's are given choices in terms of what to work on, where, and with whom
8. Pupil's can control challenge by deciding, for example, how much to write, at what pace, and with what level of support
9. Pupil's are involved in setting evaluation criteria and reviewing and reflecting on their learning.

(Perry, N. E. & Rahim, A. (2011). Studying self-regulated learning in classrooms. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 122-136). New York: Routledge.)

III Pupil's Board



(Winne, P. H., & Hadwin, A. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice. The educational psychology series* (xiv., pp. 277–304). Mahwah [N.J.]: Lawrence Erlbaum Associates Publishers

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APPENDIX 3. QUESTIONS FOR THE STRUCTURED DIARIES

Weekly diary

<p>1. List two to three things you learned this week. 2. When could you decide what to study? Or did you always study the same things as everyone else?</p>	<p>Weekly For project assessment purposes.</p>
<p>3. What kind of things did you WANT to learn this week? 4. Why did you want to learn these things? 5. How did you help yourself learn?</p>	<p>Weekly (max. 23 times per pupil) Research material</p>

Period-specific diary

<p>1. How do you feel when you understand something new? * Describe in your own words why you think you feel that way. * Give an example.</p> <p>2. Describe how you work when you learn well the things you must study. * What is going on inside you at that time? * What kind of things are related to understanding something? * How were you working at such a time? * Where and when were you working at such a time? * Why were you working that way?</p> <p>3. How do you feel when you have difficulties and you don't understand something? * What could you do at that time? * How could you help yourself? * Give an example.</p> <p>4. What makes me complete my schoolwork properly? (UBIKO 2, 3 and 4) * Draw a picture of yourself in the middle of the paper and list things that make you complete your schoolwork properly around it.</p>	<p>At the end of the period (max. 4 times per pupil) Research material</p>
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