Interaction in Educational Domains

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Edited by

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INTRODUCTION

LEARNING DOMAINS IN EDUCATION

In this volume, we take a holistic approach to education. In that view, human beings are lifelong learners who need interaction in all educational domains in order to actualize their full potential. A holistic approach to teaching and learning includes the whole profile of the student with his or her multiple intelligences and personality (Tirri & Nokelainen 2011). As early as 1956, Benjamin Bloom identified three domains in learning: cognitive, affective, and psychomotor. The cognitive domain includes content knowledge and the development of intellectual skills. Bloom developed his famous Taxonomy of Educational Objectives to describe the six levels of cognitive development (Bloom 1956). His taxonomy has been revised and updated and is still in use in many educational contexts (Anderson et al. 2000). The affective domain includes the way in which we deal with things emotionally, such as through feelings, values, appreciation, enthusiasms, motivations, and attitudes. As in the cognitive domain, Bloom's five major categories are listed from the simplest behavior to the most complex (Krathwohl, Bloom, & Masia 1973). The psychomotor domain includes physical movement, coordination, and the use of motor skills. Developing these skills takes practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. The seven major psychomotor categories are also listed from the simplest behavior to the most complex (Simpson 1972).

LEARNING AND INTERACTION

We learn by interacting with something or someone, such as teachers or fellow students, peers or teams. We can also learn by interacting with our environment, for example, with books or computers. At the Department of Teacher Education at the University of Helsinki, one of the focus areas of research is Learning and Interaction. Topics in this area include "*research related to didactics*," "*innovative learning environments*," *"the teaching-studying-learning process*," "*challenges to learning and overcoming them.*" In 2012, the conference theme of the Finnish Educational Research Association (FERA) was Interaction in Educational Research. The University of Helsinki together with the Department of Teacher Education and the Institute for Behavioral Sciences hosted the event in Helsinki. All topics related to interaction in educational research were appropriate for presentation. Moreover, FERA's conference was targeted more than ever to an international audience. The conference languages were Finnish,

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English, and Swedish. Senior researchers chaired the thematic sessions and, at the poster sessions, gave the young researchers feedback. Throughout the two-day event, we used new information technology in communication and enjoyed chances to interact in many ways. In the evenings, there were social and artistic exchanges along with good food and drinks. The conference provided opportunities for all participants to learn in cognitive, affective, and psychomotor domains.

The chapters in this book are based on the conference presentations. We informed the participants in advance that we intended to publish a book on the conference theme. All submissions were reviewed by two senior educational researchers who are experts in the chapter topics. After the peer review, the editors reassessed all of the papers and took into account the feedback from the referees before giving the guidelines for any necessary final revisions. During that process, some papers were eliminated from the publication, while others were revised for content and language. All of the texts have been edited by the same native English-language speaker.

The keynote speaker at the FERA 2012 conference, Prof. David Clarke from the University of Melbourne in Australia, has written our opening chapter. There, based on his many empirical classroom studies, he discusses international comparative research in educational interaction by constructing and concealing differences. All learning domains – cognitive, affective, and psychomotor – need to be investigated in a cross-cultural context to reveal the culture-invariant and the culture-dependent nature of teaching and learning.

Following the Prof. Clarke's contribution, we present four chapters with theoretical approaches to interaction. In the chapter by Colin Beard and Kaisu Mälkki, "Student Transformation and the Interaction between the Epistemological and Ontological Tracks: The Wider Project of Higher Education?" the authors cover all the learning domains. They concentrate especially on the role of the emotions in interactions between these domains, using a case study relevant to higher education to demonstrate. The authors of chapters 2 and 3 are philosophers in education. Chapter 2, by Andrew Stables, is entitled "Semiotics as Philosophy for Education: From Concepts To Signs," while Eetu Pikkarainen's chapter is called "From the Ontology of Interaction to the Semiotics of Education." These philosophical investigations challenge our cognitive domain to consider the semiotic and ontological aspects of educational interaction. Teija Rantala and Arniika Kuusisto finish the theoretical part of our book with their chapter on "Examining the Researcher's Position through its Interaction with Methodological and Ethical Particularities of Religion and Gender." Interaction in any of the learning domains can be seen from the ethical point of view because education is ethical in nature. In their chapter, the authors discuss the ethics of the educational researcher with special emphasis on religion and gender.

The second part of our book presents a series of empirical studies on educational interaction. Three studies take a quantitative approach: Heidi Harju-Luukkainen and Jouni Vettenranta's "The Influence of Local Culture on Students' Educational Outcomes," Antti Hilmola's "Regional and Gender Variation in the Results of Learning Outcomes in Crafts Assessment," and Elina Ketonen and Kirsti Lonka's

"How Are Academic Emotions Related to Teacher Students' General Learning Profiles?" These chapters present comparative studies related to students' learning outcomes, including both cognitive and psychomotor learning domains. Moreover, the study on academic emotions adds new knowledge to the affective learning domain and to our understanding of the interaction between the cognitive and affective aspects of learning.

The qualitative approaches demonstrated here include a chapter by Leena Knif and Seija Kairavuori, "Cultural Aspects in Understanding the Visual Arts: Pedagogical Perspectives in (Multi)cultural Interaction." Their study shows the Finnish perspective on art education and the importance of a cultural heritage that needs to be explicated in multicultural interaction. This kind of interaction deals with all three learning domains. The chapter by Kirsi Tirri, Elina Kuusisto, and Maija Aksela, entitled "What Kind of Learning Is Interactive and Meaningful to Gifted Science Students? A Case Study from the Millennium Youth Camp," discusses meaningful learning with a very special group of gifted international students. In this study, we can also see the importance to learning of addressing the affective and psychomotor domains in addition to the cognitive domain.

The third part of the book includes three chapters on programs to promote educational interaction. Seija Karppinen, Veera Kallunki, Seija Kairavuori, Kauko Komulainen, and Sara Sintonen write about "Interdisciplinary Integration in Teacher Education." Their study is a good example of design research with the goal of improving research and practice in teacher education. Ritva Kantelinen and Victoria Pogosian contribute to this with their chapter on "Finnish-Russian Cooperation in Teacher Education: The Joint Study Module *Teaching Foreign Languages to Young Learners*." Again, we need studies of different cultures in order to understand all aspects relevant to educational interaction. Kantelinen and Pogosian's study builds on that understanding as a means of improving language learning. Our volume concludes with the chapter by Ari Poutiainen, Sanna Kivijärvi, and Markku Kaikkonen, "Music for All for Music: A Study of the Resonaari Concert Audience and Equalized Interaction." Here, they introduce an educational program that promotes learning for everyone. The authors demonstrate that, in addition to the three learning domains in educational interaction, we need to include different learners.

All of the chapters in this book contribute to the current discussion and the research on learning and interaction. Research in this field must be performed in different learning domains and in various cultural contexts. Cross-cultural comparisons are needed in order to validate the findings of the empirical studies and test the culture-dependent and culture-invariant dimensions of educational interaction. We have made an effort to address each of these aspects, at least to some degree. Future studies are needed to explore and evaluate the theories and practices in educational interaction. Research in this area requires both theoretical and empirical clarification. We the editors challenge all of the authors as well as our readers to explore further the new horizons in the field of educational interaction.

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DAVID CLARKE

INTERNATIONAL COMPARATIVE RESEARCH INTO EDUCATIONAL INTERACTION: CONSTRUCTING AND CONCEALING DIFFERENCE

INTRODUCTION: HOW DO YOU KNOW THAT YOU'RE HAPPY?

The purpose of this chapter is to draw attention to acts of comparison undertaken in international cross-cultural comparative research, particularly in relation to research into educational interaction. The principal focus is the selection or development of the analytical categories by which acts of comparison are carried out. The judgments of similarity or difference made on the basis of these acts of comparison are inevitably products of the analytical categories employed. Every comparison will require some concealing of difference, since every act of comparison requires first the typification of the objects to be compared. Equally, the application of any set of criteria involves the drawing of distinctions, and these may construct difference where no difference was previously perceived. Both acts – the construction and the concealing of difference – are fundamental to contemporary, international cross-cultural comparative studies.

This chapter will highlight some concerns that the educational community must address if such international comparative studies are to contribute usefully to educational policy and curriculum development and to the actions of teachers and students in classrooms. Narratives of national identity are constructed based on such acts of comparison and on the metrics, or classificatory schemes, by which they are performed. We must be sensitive to the assumptions and conditions on which such comparisons are contingent. Two propositions lie at the heart of this chapter: first, that comparison involves a compromise between validity and comparability, and that research designs must construct a balance between these competing commitments; second, the metrics or classificatory schemes that we use to categorize and compare educational interactions are themselves the products of cultural and historical value systems that shape our analysis and our conclusions. It can be argued that national identity and even happiness are determined by the way such metrics mediate our experience of the world and also offer us images of ourselves.

Increasingly, we rely on metrics of various types to help manage the challenges of daily life. These metrics may relate to our use of water and electricity or to the level of tax we pay. Other metrics construct for us images of our world: crime rates, proportions of students completing high school, the average cost of living, and

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even sports statistics. In combination with and mediated by the level of salience that we attribute to each, these metrics construct not only our world, but ourselves. For example, we may be discontented with the level of social welfare our society provides, but our discontent will be ameliorated or amplified if we are told that according to comparative research, our social welfare is among the best (or the worst) in the world. Our actual level of social welfare has not changed, but our perception of its adequacy is likely to be modified according to our capacity to make comparisons with those we might consider our peers or legitimate comparator groups. These acts of comparison underlie many, if not all metrics. Even the act of recognition is also an act of comparison.

This principle was recognised implicitly by Thomas Aquinas (1225–1274), who identified three acts in the apprehension of the beauty of any object: "Ad pulcritudinem tria requiruntur integritas, consonantia, claritas" (translated by James Joyce as "Three things are needed for beauty, wholeness, harmony and radiance," Joyce 1968, 211).

- Integritas (the boundedness/integrity of the object) – you recognize the object as an object with integrity and singularity.
- Consonantia (the internal relatedness of the object's constituent elements) – you recognize the relatedness of the object's component parts.
- Claritas (= Quidditas, the nature of the object) – you recognize the object as distinct from all other objects. This latter act of recognition (or apprehension), although it refers to a single object, carries with it an implicit act of comparison, since it invokes the existence of other objects, different from the object of interest.

I suggest that perhaps only the drive to categorize is more fundamental than our inclination to compare (cf. Lakoff 1987). Indeed, the two activities are intrinsically entwined. In this chapter, commensurability is interpreted as the right to compare (cf. Stengers 2011). And it is the central assertion of this chapter that this right to compare cannot be assumed, but is contingent upon our capacity to legitimize both the act of comparison and the categories through which this act is performed. The need for such legitimization has been raised for the case of international comparisons of student achievement, but less frequently and less carefully for the cross-cultural comparison of curricula and classroom practice. The nature of the relevant metrics employed in such acts of comparison also requires some critical consideration.

In this chapter, I commence by examining the impact of international comparative research on the construction of national identity. Using examples from recent research studies, the validity-comparability compromise is elaborated through seven dilemmas confronting international comparative research. Educational settings, particularly classrooms, are characterized by particular types of social interactions. The interpretation and classification of these interactions must be undertaken with sensitivity to local cultural norms. Comparison may not be feasible (or legitimate) between communities whose local practices are so idiosyncratic as to offer no points of sufficient similarity to sustain comparison. This chapter identifies some of the contingencies under which any such international comparisons might be undertaken.

THE CONSTRUCTION OF NARRATIVES OF NATIONAL IDENTITY

Finland, for example, currently finds itself constructed through particular metrics. The recent success of Finnish students on tests of achievement in mathematics, science, and reading has caught the attention of the world (Programme for International Student Assessment, PISA). Such internationally prominent metrics carry the imprimatur of the OECD and inspire both celebration and reprobation among politicians and the news media. If such a prominent metric conveys a message that either corresponds to a belief that we already hold or supports a proposition we would like to be true, then we are likely to assimilate that metric into our world view. The meanings of some metrics are extrapolated beyond all reasonable limits, and the acts of students are taken as signifying attributes of nations. The messages inferred from the use of such metrics contribute to the construction of narratives of national identity (Clarke 2006).

> The assessment [Trends in International Mathematics and Science Study or TIMSS] casts students as passive, nameless metaphors of national economies, whose performance in school will predict the future relations among nations (Thorsten 2000, 72).

Our happiness is constructed thus. In fact, one can consult the "World Database of Happiness" (2012) at the Erasmus University, Rotterdam, and discover that Finland's average happiness quotient is 7.9 (on a scale of 1 to 10) and that the typical Finnish resident can look forward to 62.2 "happy life years" in a country that has an "inequality of happiness" of 1.61. The Netherlands has the world's lowest inequality of happiness quotient, at 1.42, while Angola is reported to have the highest inequality of happiness at 3.19. As an Australian, I was interested to see that we have an average happiness quotient of 7.7, and a life expectation of 62.5 "happy life years." It looks as though Australians can expect an additional three or four months of happiness in comparison with our Finnish friends, until we adjust for the inequality of happiness, after which we find that Australians can anticipate 67 adjusted happy life years, while the residents of Finland get 69. Still, the figures are fairly similar, so I guess I am pretty happy about that.

Nevertheless, one has to be careful about these metrics/indices. According to the *Huffington Post* (2011), North Korea has its own happiness index on which the happiest people in the world are the mainland Chinese with 100 points (North Korea scored 98 points), while the lowest happiness scores went to South Korea with 18 points and the United States of America, with only 3 points. All of which is to say that one path to happiness is to be the author of the metric.

While we are on the subject of metrics, Professor Geert Hofstede investigated how values in the workplace are influenced by culture. The values that distinguished countries from each other could be grouped statistically into four clusters: Power Distance, Individualism/Collectivism, Masculinity/Femininity, and Uncertainty Avoidance (Hofstede 1980). These four groups became the Hofstede dimensions of national culture. A fifth dimension was added in 1991 (Hofstede 1991) (based on

Confucian dynamism; this was "Long-term Orientation"), and in the 2010 edition of *Cultures and Organizations*, a sixth dimension was added, based on Michael Minkov's research: Indulgence vs. Restraint (Hofstede, Hofstede, & Minkov 2010).

On Hofstede's dimensions, the Japanese are described as Moderately Hierarchical, Moderately Collectivist, Very Masculine, Extremely Uncertainty Avoiding, Extremely Long-term Oriented, and Quite Restrictive. It is a national portrait largely composed of extremes. By contrast, Finnish culture is characterized as Moderately Hierarchical, Moderately Individualistic, Very Feminine, Moderately Uncertainty Avoiding, Moderately Short-term Oriented, and Moderately Indulgent/Restrictive. This is a portrait of moderation. Yet if we compare the performance of these two countries as measured by international tests of student achievement, their national levels of performance are remarkably similar.

In fact, drawing on recent PISA results, Finland and Korea would appear to be as similar (in terms of student achievement) as it is possible to be. Whether we look at Mathematical Literacy, Scientific Literacy, or Reading, the 2009 PISA results for Finland and Korea are statistically indistinguishable. What inferences might we draw from this similarity in performance? In Hofstede's terms, it is difficult to find two countries more culturally dissimilar. If we agree with Stigler and Hiebert (1999) that teaching is a profoundly cultural activity, then we need to interrogate the sorts of conclusions we might draw from the comparison of such student achievement measurements.

What is it that is being compared in research projects such as the PISA and TIMSS-R (Third International Mathematics and Science Study – Repeat) projects? And under what conditions is the comparison legitimate? National comparisons suffer from the malaise characterized elsewhere as "the aggravation of aggregation" (Clarke 1996). The aspiration to compare at the level of nation imposes a requirement to typify at the level of nation, although the explanations for any similarities or differences identified may lie at another level of analysis entirely. David Berliner (2001) focused attention on the inequalities concealed by such aggregation.

> Which America are we talking about? . . . Average scores mislead completely in a country as heterogeneous as ours . . . The TIMSS-R tells us just what is happening. In science, for the items common to both the TIMSS and the TIMSS-R, the scores of white students in the United States were exceeded by only three other nations. But black American school children were beaten by every single nation, and Hispanic kids were beaten by all but two nations. A similar pattern was true of mathematics scores . . . The true message of the TIMSS-R and other international assessments is that the United States will not improve in international standings until our terrible inequalities are fixed (Berliner 2001).

Not only are these inequalities concealed by the aggregation of national test results, but the same aggregation also encourages a belief in the legitimacy (even the utility) of characterizing the educational systems of different countries by a single-valued

national achievement metric. And not just the educational systems: The achievement of students in school is being used as a surrogate for the national economic performance of nations (Thorsten 2000).

The worrying consequence of this belief in the legitimacy of characterizing a country's educational system with a single metric is the belief that if Asian countries, for example, are consistently successful on international measures of mathematics performance, then less successful, non-Asian countries would do well to adapt for their use the instructional practices of Asian classrooms. It is worth examining this assumption in detail. Such a line of reasoning is grounded in four key assumptions:

1. That the term 'Asian' identifies a coherent cultural conglomerate (sometimes identified with Confucian-Heritage Culture or CHC) with respect to educational practice;
2. That the performances valued in international tests constitute an adequate model of mathematics, appropriate to the needs of the less successful country;
3. That differences in mathematical performance are attributable primarily to differences in instructional practice, such as lesson structure (rather than to other differences in culture, societal affluence or aspiration, or curriculum); and
4. That the distinctive instructional practices of more successful countries (e.g., norms of lesson structure), should these exist, can be meaningfully adapted for use by less successful countries.

With respect to the assumption that the term "Asian" identifies a coherent cultural conglomerate in educational practice, recent comparisons of the practices of selected classrooms in Shanghai, Seoul, and Tokyo (all CHCs) revealed substantial differences in such basic classroom practices as who speaks and what the speaker is able to say (Clarke, Xu, & Wan 2010; Xu & Clarke 2013).

The first three lessons of one topic sequence were analyzed for one eighth-grade mathematics classroom in each of three cities, Shanghai (China), Seoul (South Korea), and Tokyo (Japan), and the results are shown in Figure 1. Even without probing more deeply, the distribution of opportunities for classroom public speech between teacher and students is very different in each city. Striking differences are also evident in the use of choral response among the three classrooms; what constitutes a key instructional strategy in one classroom (Shanghai) is barely employed at all in another (Tokyo). And these differences extend to the nature of the different spoken contributions. Figure 2 shows the public voicing of key mathematical terms and how this was distributed between the teacher and the students (including choral response).

Both the consistency of practice over each set of three lessons and the differences in the use of technical mathematical language between the three classrooms provide a powerful counter-argument to the proposition that "the Asian classroom" (or the Confucian-Heritage Classroom) can be taken to signify a consistent, coherent, and singular body of practice.

To return to the dilemma of legitimate inference from the comparison of the national results of student achievement: All three of the school systems in which

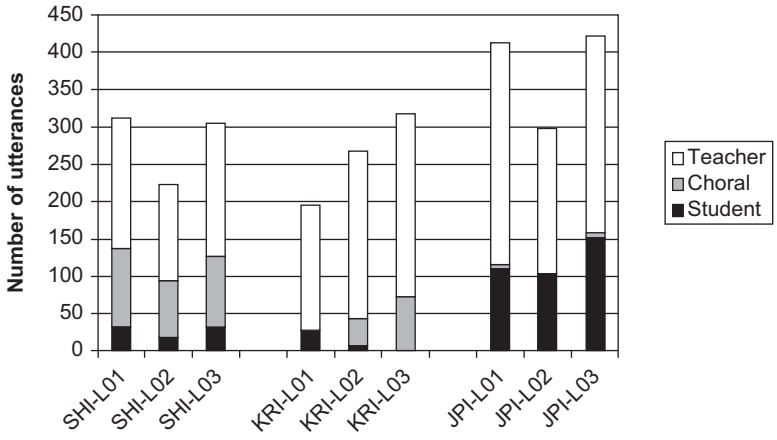

Figure 1. Public utterances in three classrooms (from Xu & Clarke 2013).

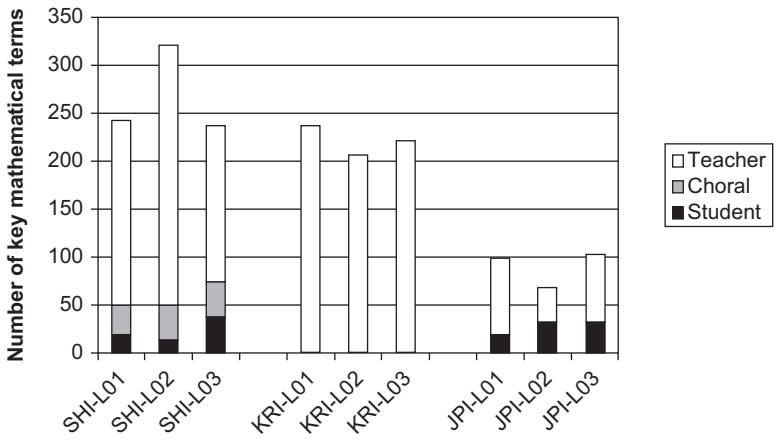

Figure 2. Public use of mathematical terms in three classrooms (Xu & Clarke 2013).

the classrooms in Figures 1 and 2 were situated can be described as high-achieving school systems, based on the TIMSS (or PISA) measures of national performance. In constructing all three school systems as similar from the point of view of student performance, the TIMSS results conceal profound differences in classroom practice between these similarly performing countries. From another perspective, this suggests that student performance is an extremely poor predictor of pedagogical practice. This does not mean that the classroom practice of high-achieving countries is not worthy

of study: only that the instructional practices leading to high student achievement can be different in very fundamental ways.

THE CHALLENGE OF LEGITIMATE COMPARISON: THE VALIDITY-COMPARABILITY COMPROMISE

How then can we undertake legitimate and useful international (and cross-cultural) comparisons when the act of comparison requires a preceding act of typification, which may conceal important explanatory detail? And, to pose another challenge: From the perspective of which culture is the comparative analysis undertaken? In this regard, Säljö has said:

> Culture is thus what allows us to perceive the world as meaningful and coherent and at the same time it operates as a constraint on our understandings and activities (Säljö 1991, 180).

Educational research is frequently conducted from a "western" perspective and evaluates the practices it studies by "western" criteria.

> This research remains largely bounded by the Western conception of (teacher-centred) pedagogical practice and by implicit social rules pertaining to authority and social participation (Fuller & Clarke 1994, 143–144).

Critical in the legitimization of these acts of comparison is the validity of the categories we employ and of the act of comparison itself. Much of the focus in this chapter is on cultural validity, which I interpret (with Säljö 1991) as a key determinant of practice in the international settings I aspire to compare. Research designs, especially data generation and categorization processes, can misrepresent or conceal cultural idiosyncrasies in the interest of facilitating comparison.

This chapter considers this validity-comparability compromise in relation to research into both curriculum and classroom practice. Curricular comparisons raise issues related to the structure of school knowledge and the aspirational character of valued performances. Comparisons of classroom practice foreground the performative realization of school knowledge and introduce the teacher as curricular agent (among other roles), modelling, orchestrating, facilitating, and promoting performances aligned with the educational traditions of the enfolding culture. Any cross-cultural comparative analysis faces the challenge of honoring the separate cultural contexts, while employing an analytical frame that affords reasonable comparison.

The challenge of cross-cultural comparison can be illustrated through seven "dilemmas," which reveal some of the contingencies under which international comparative research might be undertaken. The issues raised by each dilemma are not mutually exclusive sets. Specific empirical examples from current international research provide the vehicle by which the entailments of each dilemma can be explored to identify areas of cross-cultural research requiring critical examination. Relevant theory is invoked as required by each emergent contingency.

Dilemma 1: Cultural-Specificity of Cross-Cultural Codes

Use of culturally-specific categories for cross-cultural coding (e.g., participation).

In an international comparative study, any evaluative aspect is reflective of the cultural authorship of the study. If we are to make judgments of merit, whether they be about student achievement or classroom practice, we can only do so from the position of the authoring culture (Clarke 2003). In seeking to make comparisons between the practices of classrooms situated in different cultures, the most obvious comparator constructs become problematic. One example would be attempts to characterize a classroom by the level of "participation."

In the Chinese adaptation of the research design for the Middle School Mathematics and Institutional Setting of Teaching (MIST) project, the decision was made not to use the Instructional Quality Assessment (IQA) instrument (Silver & Stein 1996), but instead to develop a local (Chinese) instrument for the evaluation of mathematics classroom instruction. The reason for the rejection of the IQA instrument for use in Chinese school settings reflected the embeddedness, within the instrument, of particular values characteristic of the cultural setting and the educational philosophy of the authoring culture (the U.S.A.). For example, for the measurement of students' participation in classroom instruction, new criteria were needed that accommodated the larger class size and the norms of social interaction of the Chinese mathematics classroom. Table 1 shows the IQA criteria for evaluating the level of student participation in teacher-facilitated discussion in mathematics classes.

In countries such as China and Korea, teachers in both primary and secondary schools make extensive use of elicited student choral response as a key instructional strategy (see Table 1 and Clarke 2010). In the lessons analyzed from one Shanghai classroom, a large number of choral responses (~80) were used in each lesson. In the analysis of a classroom in Tokyo, there was a similar number of individual student public statements, but no evidence of choral response. Applying the IQA participation criteria (Table 1), the regularity and frequency of the use of choral responses would characterize the classroom in Seoul as participatory at a level comparable to the

Table 1. Participation Criteria from the Instructional Quality Assessment (IQA) Instrument (Silver & Stein 1996)

	Was there widespread participation in teacher-facilitated discussion?
4.	Over 50% of the students participated consistently throughout the discussion.
3.	to 50% of the students participated consistently in the discussion OR over 50% of the students participated minimally.
2.	to 50% of the students participated minimally in the discussion (that is, they contributed only once.)
1.	Less than 25% of the students participated in the discussion.
n/a	Reason:

classroom in Tokyo. Yet the students in the Tokyo classroom participated primarily through individual contributions rather than by choral response, and the type of teacher-facilitated discussion and the nature of student participation in that discussion in the two classrooms were sufficiently different to make their comparability with respect to participation highly questionable.

Dilemma 2: Inclusive vs. Distinctive

Use of inclusive categories to maximize applicability across cultures, thereby sacrificing distinctive (and potentially explanatory) detail (e.g., mathematical thinking).

In a recent study, comparison was made of the ways in which mathematics curricula are framed in Australia, China, Finland, and Israel. Similarities and differences were identified in the organization of mathematics curricula in the four countries in terms of their aims, content areas, and performance expectations. In particular, analysis was undertaken of the ways in which "mathematical thinking" was framed through curricular statements.

The key documents analyzed in this study were the Victorian Essential Learning Standards (VELS), the Chinese Mathematics Curriculum Standards (CMCS), the Finnish National Core Curriculum (FNCC), and the Mathematics Curriculum (Israel) (MCI). The four curricula are structurally quite different and prioritize different types of performance. The excerpts below capture some of these qualitative differences.

> See mathematical connections and be able to apply mathematical concepts, skills, and processes in posing and solving mathematical problems (VELS).
>
> [Translation:] Obtain important mathematics knowledge that is essential for functioning in society and further development (including mathematical facts and experience in participating in mathematics activities) and basic mathematical thinking skills, as well as essential skills of application (CMCS).
>
> The task of instruction in mathematics is to offer opportunities for the development of mathematical thinking and for the learning of mathematical concepts and the most widely used problem-solving methods (FNCC).
>
> [Translation:] Mathematics is not only a collection of calculated algorithmic operations that serve an applied purpose, but also a subject with its own structure that includes unique thinking and investigation methods. The goal of the curriculum is to generate a change in the way students view the subject (MCI).

Any attempt to characterize the relative emphasis given to particular types of valued performance at different grade levels can only be undertaken if a common classificatory framework can be imposed on all curricula. But such a general framework must not be allowed to mask the significant emphasis given to Geometry in grades 7 to 9 in China or to "Communicating" in grades 3 to 5 in Finland, or the idiosyncratic prioritizing in grades 7 to 9 in Israel of "the evolution of phenomena from the perspective of

mathematics." The danger is that the commensurability demands of such comparisons conceal major conceptual differences in the curricular expression of categories of school knowledge. The act of reconstructing culturally-specific categories to enable cross-cultural comparisons runs the risk of distorting the knowledge categories we seek to compare.

> Commensurability is created and it is never neutral, [it is] always relative to an aim (Stengers 2011, 55).

In cross-cultural research the imposition of an "external" classification scheme for purposes of achieving comparability can sacrifice validity by concealing cultural characteristics and by creating artificial distinctions. Comparability is achieved through processes of typification and omission, and each has the potential to misrepresent the setting.

> Ethnographic comparisons of cultures or cultural practices either remained entangled in debates over colonialism, orientalism, writing culture, or reflexivity, or it quietly withdrew to the regional and disciplinary "comfort zones" of like-minded scholars. Comparison became an exercise within ethnographic fields rather than across fields. This is why the established statistical approach to cross-national or cross-cultural comparison lacks an ethnographic counterpart of similar disciplinary standing (Niewoehner & Scheffer 2008, 279).

The interpretive comparisons required by ethnography fundamentally invoke metaphor, since the act of comparison implies a sub-text that says, "This object resembles this other object to this extent." Metaphor is the measure of our capacity to compare. The implication is that our acts of comparison in relation to social interaction and its products should be fuelled by the creative use of metaphor and not solely by the linear metrics of competitive evaluation.

Dilemma 3: Evaluative Criteria

Use of culturally-specific criteria for cross-cultural evaluation of instructional quality (e.g., student-spoken mathematics).

Where research is specifically constructed to be evaluative, the question arises as to the legitimate application of criteria developed in one culture to the practices of another culture. The use of evaluative criteria posits an ideal of effective practice that should be substantiated by research. Problems arise when the research on which a criterion is based is itself culturally specific.

For example, despite the emphatic advocacy in western educational literature, classrooms in China and Korea have historically not made use of student-student spoken mathematics as a pedagogical tool (see Figures 3 and 4).

In research undertaken by Clarke, Xu, and Wan (2010), classrooms were identified in which student fluency in the spoken use of technical mathematical terms (student spoken mathematics) was purposefully promoted in public interactions, but not in private ones (e.g., Shanghai classroom 1), in both public and private interactions

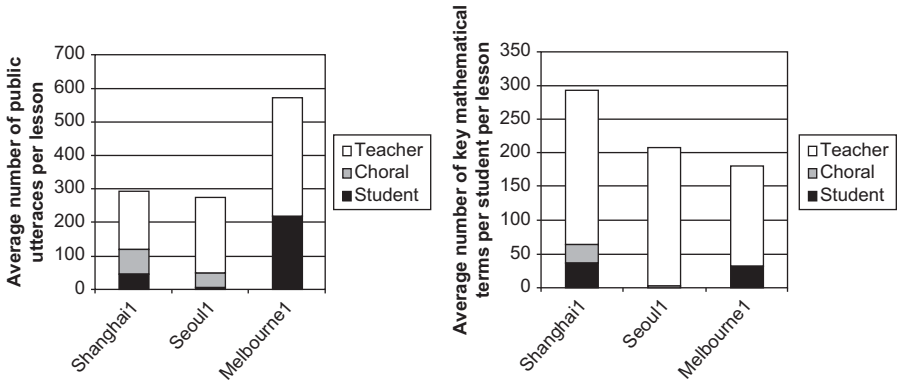

Figure 3. A comparison of public speech in three mathematics classrooms: Utterances and Mathematical Terms, respectively (each bar represents the average of five lessons.)

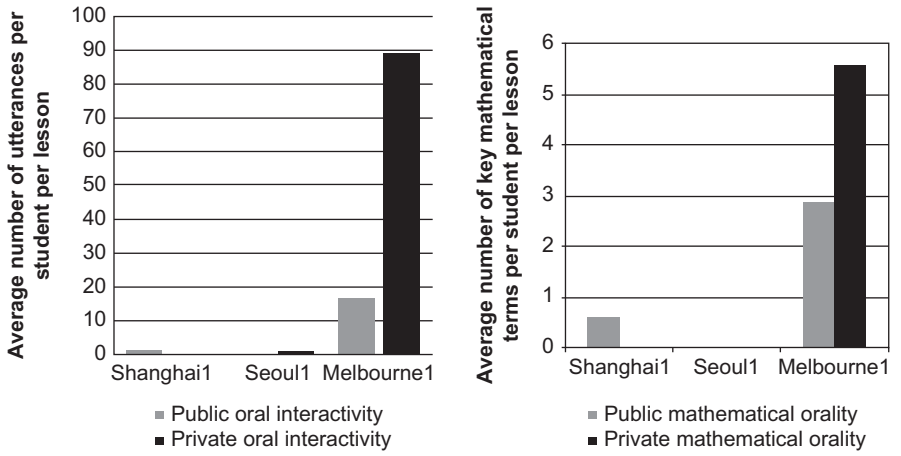

Figure 4. Comparison of public and private speech for three mathematics classrooms.

(e.g., Melbourne 1), and in neither public nor private interactions (e.g., Seoul 1). Each of these classrooms enacts a distinctive pedagogy with respect to student-spoken mathematics.

The following quotation is a good example of the strident advocacy of student speech as a classroom priority fuelled by western research:

> Students' participation in conversations about their mathematical activity (including reasoning, interpreting, and meaning-making) *is essential* for

> their developing rich, connected mathematical understandings (Silverman & Thompson 2008, 507, emphasis added).

If the occurrence of student-spoken mathematics is identified with quality instruction, then the instructional practice of the classroom in Seoul would be judged to be deficient. The classrooms in Shanghai and Melbourne differed significantly in the extent to which private student-student interactions were encouraged, but the teachers in both classrooms prioritized student facility with spoken mathematics (teacher interview data and classroom observation). In the Shanghai classroom, promotion of this capability was developed solely through public discourse, whereas in the Melbourne classroom, private student-student mathematical speech was an essential pedagogical tool.

Interestingly, in post-lesson interviews, the students from Melbourne and Shanghai showed comparable fluency in their use of the language of mathematics, while students from the classrooms in Seoul showed little evidence of such a capability (see Figure 5). Criticism of the Seoul teacher for not succeeding in developing student fluency in spoken mathematics is inappropriate, since it ignores the fact that this was not a goal of that teacher's instruction. Evaluative judgments of instructional quality made in the context of international comparative research must justify the model of accomplished practice implicit in the criteria employed and provide evidence of the cross-cultural legitimacy of these criteria.

In a wide range of western educational writings, the promotion of student mathematical talk is seen as an instructional strategy by which mathematical learning is facilitated, and student mathematical talk is also valued as a learning outcome in its own right. Student spoken mathematics is therefore advocated not just because students need to talk mathematics in order to learn mathematics, but also because they need to learn to talk mathematics.

> The assumption that thinking is closely related to talking is true in Western cultural contexts, and at the same time, the assumption that talking and thinking are unrelated to each other is true in East Asian cultural contexts (Kim 2002, 839).

> The opposite of a true statement is a false statement, but the opposite of a profound truth can be another profound truth (attributed to Niels Bohr in Rozental 1967, 83).

Is it possible that talking facilitates learning in western cultures, while talking does not facilitate learning in Asian cultures? The implications are that learning (and therefore the advocacy of instructional practice) cannot be understood or theorized other than within the encompassing culture. In this view, culture does not merely provide the context for teaching/learning, culture determines the conditions for

optimal teaching/learning and the nature of its performative realization, because learning and teaching cannot be considered independent of culture.

Figure 5 offers two striking contrasts: (1) The prioritization of language in the Melbourne classroom is demonstrably associated with significant student facility in the use of technical mathematical terms. Students were asked in post-lesson interviews: "What was the lesson about?" and "What did you learn?" These questions did not prompt the use of particular terms, yet they were sufficient in the context of an interview to stimulate significant use of mathematical terms. (2) Although the classrooms in Seoul and Shanghai were similar in the absence of student-student "private" talk, the Shanghai teachers' prioritization of mathematical orality (see Clarke, Xu, & Wan 2010) was demonstrably successful in developing students' fluency with mathematical language, unlike the Seoul classroom, in which student facility with spoken mathematics was not a priority. An evaluation of either teaching or learning in any of the three classrooms would require the specification of criteria that could not legitimately reflect the different educational value systems operating in the three settings.

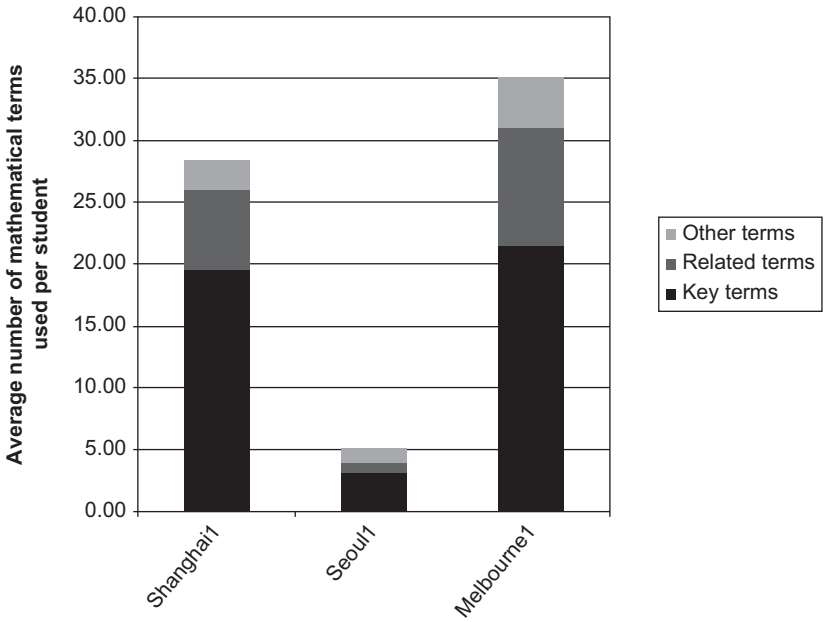

Figure 5. Student facility with technical language in post-lesson interviews (averaged over the interview responses of ten students for each classroom).

Dilemma 4: Form vs. Function

Confusion between form and function, where an activity coded on the basis of common form is employed in differently situated classrooms to serve quite different functions (e.g., kikan-shido or between-desks instruction).

An inevitable consequence of opting for a research design that requires a nationally representative sample of individual lessons is the inferred obligation to construct "the typical lesson" – to average over the distinctive lesson elements, whose location in the lesson is a direct and informative reflection of the lesson's location in the topic sequence (Clarke, Mesiti, O'Keefe, Xu, Jablonka, Mok, & Shimizu 2008).

The teachers whose classrooms were documented in the Learner's Perspective Study (LPS) showed little evidence of a consistent lesson pattern, but instead appeared to vary the structure of their lessons purposefully across a topic sequence. The evident differences in the manner in which teachers structured their lessons suggested that another unit of analysis was needed: one that corresponded more closely to the decisions made by each teacher regarding the structure of any particular lesson. Analysis then focused on recognizable "lesson events."

Kikan-shido (a Japanese term meaning "between-desks-instruction") has a *form* that is immediately recognizable in most countries around the world. In *kikan-shido*, the teacher walks around the classroom, while the students work independently, in pairs, or in small groups. Although *kikan-shido* is immediately recognisable to most educators by its form, it is employed in classrooms around the world to realize very different functions. A teacher undertaking *kikan-shido* in Australia will do so with very different purposes in mind from those pursued by a teacher in Hong Kong or, for example, a teacher in Japan. In reporting the frequency of occurrence of an activity such as *kikan-shido* for purposes of comparative analysis, the researcher conflates activities that are similar in form, but which may be employed in differently situated classrooms for quite distinct functions. Such a conflation can create an impression of similarity, although differences in practice are actually profound (for more detail, see Clarke, Emanuelsson, Jablonka, & Mok 2006).

Dilemma 5: Linguistic Preclusion

Misrepresentation resulting from cultural or linguistic preclusion (e.g., Japanese classrooms as underplaying intellectual ownership).

The analysis of social interaction in one culture using expectations encrypted in classificatory schemes that reflect the linguistic norms of another culture can misrepresent the practices being studied. This can occur because characteristics of social interaction privileged in the researcher's analytical frame may not be expressible within the linguistic conventions of the observed setting. For example, the Japanese value implicit communication that requires speaker and listener to supply the context without explicit utterances and cues. This tendency is typically found in leaving sentences unfinished. Consequently, in Japanese discourse, agency or action

are often hidden and left ambiguous. In English, when introducing a definition, the teacher might employ a do-verb: "We define." In a Japanese mathematics classroom, the teacher often introduces a definition in the intransitive sense (*Sou Natte Iru* = "as it is" or "something manifests itself") as if it is beyond one's concern. Such differences in the location of agency, embedded in language use, pose challenges for interpretive analysis and for categorizing classroom dialogue.

Dilemma 6: Omission

Misrepresentation by omission, whereby the authoring culture of the researcher lacks an appropriate term or construct for the activity being observed (e.g., Pudian).

The Sapir-Whorf hypothesis suggests that our lived experience is mediated significantly by our capacity to name and categorize our world.

> We see and hear . . . very largely as we do because the language habits of our community predispose certain choices of interpretation (Sapir 1949, 162).

Marton and Tsui (2004) suggest that "the categories . . . not only express the social structure but also create the need for people to conform to the behavior associated with these categories" (Marton & Tsui 2004, 28). Our interactions with classroom settings, whether as learners, teachers, or researchers, are mediated by our capacity to name what we see and experience. Speakers of one language have access to terms, and therefore to perceptive possibilities, that may not be available to speakers of another language.

> No comparison is legitimate if the parties compared cannot each represent his own version of what the comparison is about; and each must be able to resist the imposition of irrelevant criteria. In other words, comparison must not be unilateral and, especially, must not be conducted in the language of just one of the parties (Stengers 2011, 56).

For example, in the Chinese pedagogy "Qifa Shi" (Cao, Clarke, & Xu 2010), the activity "Pudian" is a key element. Pudian can take various forms: Connection, Transition, Contextualizing, but its function is to help students develop a conceptual, associative bridge between their existing knowledge and the new content. There is no simple equivalent to Pudian in English, although teacher education programs delivered in most English-speaking countries would certainly encourage the sort of connections that Pudian is intended to facilitate. Many such pedagogical terms have been collected in a variety of languages (Clarke 2010), describing classroom activities central to the pedagogy of one community, but unnamed and frequently absent from the pedagogies of other communities. It follows that an unnamed activity will be absent from any catalogue of desirable teacher actions and consequently denied specific promotion in any program of mathematics teacher education. It is also likely that such activities will go unrecognized in reports of cross-cultural international research, where the authoring culture of the research report lacks the particular term.

Dilemma 7: Disconnection

Misrepresentation through disconnection, whereby activities that derive their local meaning from their connectedness are separated for independent study (e.g., teaching and learning).

Whether we look to the Japanese *gakushu-shido*, the Dutch *leren* or the Russian *obuchenie*, we find that some communities have acknowledged the interdependence of instruction and learning by encompassing both activities within one process and, most significantly, within one word. In English, we dichotomize classroom practice into teaching or learning. One demonstration of the consequences of the inappropriate disconnection of actions that should be seen as fundamentally connected is evident in the comparison of two published translations involving Vygotsky's use of the term *obuchenie* (discussed in Clarke 2001).

> From this point of view, *instruction* cannot be identified as development, but properly organized *instruction* will result in the child's intellectual development, will bring into being an entire series of such developmental processes, which were not at all possible without *instruction* (Vygotsky, as quoted in Hedegaard 1990, 350).
>
> From this point of view, *learning* is not development; however, properly organized *learning* results in mental development and sets in motion a variety of developmental processes that would be impossible apart from *learning* (Vygotsky 1978, 90).

The analogous disconnection of public and private speech in classrooms, and of speaking and listening (Clarke 2006), has the same effect of misrepresenting activities that may be fundamentally interrelated (not just conceptually, but also functionally connected) in their enactment in particular classroom settings.

DISCUSSION

In some studies, the power to make generalizations about national patterns of classroom practice has been bought at the cost of explanatory power related to the antecedent and consequent conditions by which the motivations and consequences of participants' actions might be understood.

The pursuit of commensurability in international comparative research by imposing general classificatory frameworks can misrepresent valued performances, school knowledge, and classroom practice as these are actually conceived by each community and sacrifice validity in the interest of comparability. In this chapter, the "validity-comparability compromise" has been proposed as a theoretical concern that has significant implications for international comparative research. The identified dilemmas raise a variety of different issues and illustrate some of the consequences of ignoring this central concern.

Partnerships with those whose practices are being compared can minimize misrepresentation, but the necessity of the compromise is inescapable. The interpretation

and application of international comparative research will be critically contingent on researchers' capacity to address those "dilemmas" pertinent to their particular design. I hope that the issues raised here fuel a wider engagement in the critical interrogation of international comparison as a socio-material knowledge practice.

Acts of cross-cultural comparison must start from shared understandings of the limits to precision in the application of any construct beyond its authoring culture (the implications for the universal use of English are profound). Cross-cultural comparative classroom research requires new forms of research partnership and communication in which local conventions, priorities, aspirations, and discourse form the basis for the negotiation of both the unit/s of analysis and the analytical frame/s applied. Interestingly, this negotiative process becomes a source of significant cross-cultural insight, and its documentation constitutes an essential research activity. In this sense, educational interaction is both the subject of research and the means by which research is undertaken. International comparative research designs must be sensitive to the cultural specificity of the settings being analyzed and to the pedagogical constructs and action categories employed in that analysis. If our happiness requires the sanction of a metric, then we must ensure that the metric adequately models our aspirations

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PART I

THEORETICAL APPROACHES TO STUDYING EDUCATIONAL INTERACTION

COLIN BEARD & KAISU MÄLKKI

1. STUDENT TRANSFORMATION AND THE INTERACTION BETWEEN THE EPISTEMOLOGICAL AND ONTOLOGICAL TRACKS: THE WIDER PROJECT OF HIGHER EDUCATION?

INTRODUCTION

Higher education has long been seen as the heart of knowledge and epistemological development. However, recent advances in the sphere of research on learning challenge higher education to take a broader and more integrative perspective, so that the ontological self of the student can be "brought into view and engaged with" (Barnett 2007, 9). Furthermore, Blackie et al. (2010, 641) suggest that "if we are to take the idea of the person of the student (transformation) seriously, we need to begin to pay attention to the emotional side of education."

In this chapter we thus pay attention to student emotions and bring out and engage with the possibilities of transformation in the context of higher education. We first explore the historical landscape of learning by presenting a brief outline of evolving views of human learning. We verify the increased understanding of integration and complexity. The paper then focuses on the problematic relationship between affect and reason: we suggest that interaction with knowledge *per se* can generate ambivalence, and so we suggest that at the edge of knowing lies a difficult emotional territory, where the interaction between the epistemological and the ontological self presents opportunities for transformation while involving challenges that need to be acknowledged. The paper also offers a practical case study for integrating theory with practice and for illustrating the role of emotions in perspective change and transformation.

Thus, this chapter approaches the theme of interaction in education by exploring, from a theoretical perspective, the challenges of student interaction with knowledge within the epistemological track of higher education. We propose that a more fruitful way to address and work with these challenges will come about by recognizing and considering both the epistemological and the ontological tracks of higher education, especially the interaction between those two tracks.

TOWARD INTEGRATIVE VIEWS OF LEARNING

Theorizing about how adults learn has long been subject to the constant criticism associated with notions of "deficit," which focuses on missing elements within

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 25–36.

the prevailing hegemony. By presenting a brief quasi-evolutionary outline of the unremitting quest for more "complete" ideas about how humans learn, we allow increased interaction to become visible.

By the early twentieth century, behaviorism had emerged as a dominant view linked to, and associated with, a western approach and operant conditioning (Pavlov 1927; Skinner 1974). The animalistic focus gradually shifted to cognitivist theories, which began to surface in the late 1950s. Major contributors included Lewin (1951) and Gagne (1974), but perhaps the most well known was Bloom (1956), who developed a spatial hierarchy of cognition (higher/lower forms). Seeing the "human" as unique, intelligent, and rational, the cognitive focus alluded to the computational processing of thinking, remembering, analyzing, and seeking ways to explain and make sense of the world.

By the late 1960s, humanist theories were emphasizing personal agency and the fulfillment of potential. Perhaps the best-known proponent was Carl Rogers (1969), whose seminal text, *Freedom to Learn*, expressed a liberating metaphor. For Rogers, feelings, warmth, acceptance, and the nurturing of people were central to learning: individuals, if treated in the right way, had it within them to work towards solutions to problems. Significantly, these ideas from the sixties were instrumental in the development of contemporary learner-centered methods: they are not inventions of the twenty-first century.

Cultural and social context became increasingly recognized as important (e.g., Vygotsky 1978), giving rise to a range of social constructivist theories, with learning seen as active and contextualized. Learners were seen not only to be constructing knowledge for themselves, as individuals, but also to be constructing knowledge through social interaction. While social constructivist theories remained influential, they were now positioned among a multitude of views on human learning; examples are psychoanalytic theories that unearth the role of hidden desires and fears (Britzman 1998); the questioning of a monolithic notion of a single intelligence (Gardner 1983); advances in neuroscience leading to a reassessment of biological determinism (Damasio 1995); and a widening recognition of embodiment in learning (Lakoff & Johnson 1999; Sheets-Johnstone 2009). Many others have contributed to cognitive science, particularly in relation to constitutional rather than causal understandings of embodied and environmentally-embedded cognition (Shapiro 2011). The role of the senses (for an overview, see Abram 1997), and specifically the role of bodily gestures (Gallagher 2005) and the emotions (Illeris 2002; Mälkki 2010; Ketonen & Lonka 2013), are all receiving renewed attention in the search for new meaning about how humans learn.

Although far from presenting a complete picture, this historical sketch charts a trajectory from ethology to ecology. Knowledge about human learning thus shifts from animalistic simplicity, rooted in behavioral observation, predictability, and control, which dominated early understanding about human learning and teaching, to the increased awareness that human learning is complex. While raising new

methodological challenges (e.g., Mälkki 2011), the move away from "filling gaps" to exploring multiple elements of human learning can be described or interpreted using *ecological* metaphors (Sterling 2001; 2003). Davis and Sumara (1997, 111) apply just such metaphors and offer defining parameters. They suggest that all the contributing factors in any learning situation are "intricately, ecologically, and complexly related. Both the cognizing agent and everything with which it is associated are in constant flux, each adapting to the other in the same way that the environment evolves simultaneously with the species that inhabit it." Thus, the current state of research may in effect be characterized as a striving towards integrative explorations of human learning (see Dillon 2007), i.e., an increased awareness of interaction between those dimensions of learning that previously may have been considered separately.

THE CHALLENGES OF INTEGRATION WITHIN HIGHER EDUCATION

Within higher education, the efforts to achieve integrative thinking regarding such a complex issue as human learning may be seen as being hindered by conventional dualistic thinking, which has far-reaching consequences for our understanding of learning today. These consequences are visible, for example, in the splitting and privileging of the rational over the affective in learning (Boler 1999), which appears to prevail in our understanding of the general project of higher education. In a similar vein, emotions have long been regarded as problematic in education, as "inappropriate territory": Tennant comments that "this is difficult to understand, especially given the importance that adult educators attach to the emotional climate of the classroom and the anxieties, fears and hopes of learners" (1997, 22). Mortiboys (2002) makes the case for developing emotionally intelligent lecturers, noting that while it would be disturbing if universities were emotion-free zones, "curiously, so much of the culture in higher education implies that they are" (2002, 7).

In the spirit of illuminating this neglected aspect of higher education, recent research has identified a wide range of emotions experienced by students involved in higher education learning (Pekrun et al. 2002; Beard 2005; Beard et al. 2007; Crossman 2007; Young 2000; Rowe 2013; Ketonen & Lonka 2013; Linnenbrink-Garcia & Pekrun 2011). Nevertheless, the oppositional relationship of affect and reason limits integrative thinking about the learning experience. Feminist writers such as Boler (1999) have expounded on this issue by problematizing the splitting and privileging of the rational over the affective. Despite the central underpinnings of emotions in outdoor education programs in the early 1900s, and the broader influence on emotionality in learning and teaching by educational thinkers (Bloom et al. 1964; Habermas 1988; Knowles 1980, and, more recently, Boud & Miller 1996), the practicalities of emotions in learning and teaching receives little or no attention in contemporary higher education texts that are popular and widely used in lecturer development (e.g., Light & Cox 2001; Ramsden 2003; Biggs 2003).

THE INTERACTION BETWEEN THE EPISTEMOLOGICAL AND THE ONTOLOGICAL TRACKS

The emphasis on the epistemological track in discussions about higher education may also be seen in the frequent references to academic skills such as critical thinking and reflective expertise. Or, along similar lines, one of the more recent ideas about the aims of higher education is integrative knowledge, which posits that expert knowledge involves a flexible integration of theoretical, practical, and reflective knowledge, and therefore the integration of these knowledges should be supported during a person's studies (see e.g., Tynjälä et al. 2003). While in essence these goals once again emphasize the epistemological dimensions of learning and the development of cognition during the course of higher education, the kind of development that is portrayed, necessitates, in essence, a broader way of understanding the process of learning than what is currently stated in connection to presenting these development goals.

In other words, the development of such skills may not, in our view, result from the mere construction of new knowledge based on one's previous frameworks, but rather a more profound restructuring of one's frameworks of meaning is called for, a restructuring that *transforms* one's perspective into a view that is more integrative and flexible and capable of critically assessing new knowledge. In effect, the change expected to take place during higher education is not a mere addition of knowledge to a cumulative set of previous knowledge, but instead is a change in disposition: the entire framework that orients a person in meaning making now alters (Kegan 2000; Mezirow 1991; 2009).

While this restructuring of meaning frameworks represents a new position vis-à-vis knowledge, such descriptions of the process only point to the epistemological aspects. As Kegan (1982) puts it:

> The Piagetian approach, viewing meaning making from the outside, descriptively, has powerfully advanced a conception of that activity as naturally *epistemological*; it is about the balancing and rebalancing of subject and object, or self and other. But what remains ignored from this approach is a consideration of the same activity from the inside, what Fingarette would call the "participative." From the point of view of the "self," then, what is at stake in preserving any given balance is the ultimate question of whether the "self" shall continue to be, a naturally *ontological matter*. (Kegan 1982, 12, emphasis added)

Kegan's point indicates that the meaning-making activity is not merely an act of assimilation or accommodation of meaning, as in the *knowing* perspective that, following Piaget, is emphasized in discussions on higher education. Rather, for the "self," meaning-making essentially entails a question of the continuation of its being. (Green & Mälkki 2013) When, in the practices of education, the learning processes are considered only from the perspective of knowing while the experiential and

ontological aspects are neglected, only a skeleton of learning is attained (see also Malinen 2000).

Without a fuller understanding of the learning process itself and of the kind of learning that is required of students, the ability of teachers to support learning remains limited. When we understand more fully the student experience in learning, we may be better able to understand teaching (see Palethorpe & Wilson 2011). Therefore, it is important to explore the student experience of transformation more deeply, to determine what the accepted goals actually mean for the students, how they experience the process, what it requires of them, what kinds of challenges emerge, and how the students may be supported.

THE EDGE OF KNOWING

In order to assess critically their prevailing knowledge and to reach deeper levels of understanding, students, it has often been observed, should be supported to reach the edges of their knowing. For instructors to have their students reach the edges of knowing may appear to be a desirable state in which new insights and viewpoints may be attained. For the student, however, the edge may be a more ambivalent experience, as will be argued below.

Let us stay a moment with this notion of the edge and explore what it may involve. The edge may refer to something that separates two states, at the end of something, and thus on the verge of something new. The edge in this case sets the moving boundary between what is known and what is not yet known (Berger 2004). If one is to gain new perspective on a familiar issue, then the frameworks through which one views and interprets experience must change. Because the new conception requires a shift in perspective, it is not fully comprehensible from within the previous frameworks, within the light of one's previous understandings. This shift, however, may not be something that happens as a mere jump from the old framework to the new (see Mälkki & Green 2013).

Rather, the change is something that involves a struggle at the liminal space, the in-between zone between the old and the new conceptions (Mälkki & Green 2013; see also Palethorpe & Wilson 2011). The learner finds himself in a state of uncertainty and often also a state of anxiety, as the previous knowing appears to be inadequate, while new understandings have yet to be formed and committed to. Thus, one struggles at the edge of one's knowing – between the actual and the potential plane, while neither is clear (see Berger 2004). One is faced with the challenge of letting go of the old conception in order to embrace a new one.

Giving up an old perspective, which is required if a new perspective is to be acquired, means letting go a viewpoint that not only used to guide one's interpretations and bring understandability to the world, but also that brought coherence and continuity to the experience of the self. A person has to let go of something that used to be part of the self (Mälkki & Green 2013). The notion of liminal space introduces the idea that to acquire a new perspective is not about epistemology alone. Dealing

with the edge of knowing entails a significant ontological aspect as well. In other words, in the liminal space there is a fundamental shift *from knowledge being at the heart of change and reconstructions to the self being challenged and ultimately*, *reconstructed.*

DEALING WITH THE EXPERIENCE OF THE EDGE

The above discussion on the challenges faced at the edge of knowing and letting go one's epistemological perspective suggests that the emotions signal the challenges to ways of knowing as well as to the self. In other words, we experience anxiety when our prevailing ways of knowing appear to be inadequate. These kinds of unpleasant emotions are indications of "edge-emotions," which we experience at the edges of our comfort zones (Mälkki 2010; 2011). When nothing questions our assumptions and we are able to interpret situations in light of our previous experiences, we feel reasonably comfortable, and thus, may be said to be in the comfort zone. By contrast, when our beliefs, attitudes, values, shared assumptions, sources of acceptance, relationships, and sense of understanding the world are questioned, we experience discomfort and anxiety. These unpleasant emotions are called edge-emotions, because they appear on the edges of our comfort zones. Basically, they signal a threat to our frameworks of meaning and to the current configuration of ourselves. (Mälkki 2010; 2011)

Both the pleasant emotions experienced in the comfort zone and the unpleasant edge-emotions have their basis in the biological function of emotions (Mälkki 2010; 2011). In essence, emotions support survival by orienting us automatically towards concrete action, such as fight, flight, or freeze in the event of danger; more generally, the emotions orient us to avoid pain and to seek comfort and security instead (Damasio 1999; 2003). Similarly, when our ways of knowing, our being, or our acting in the world are challenged and thus threaten our mental or social world, the emotions automatically orient us to action in order to manage the threat. This action, however, is carried out by the mental or cognitive tools we have at our disposal. We intend to return to the comfort zone, so as to feel comfortable and safe again: we tend to avoid dealing with the unpleasant issues that question our ways of knowing or being or interpret the issues in such a way that they no longer appear threatening (Mälkki 2010; 2011).

On a basic level, this mechanism supports the consistency of our meaning frameworks and identity, and, as such, is necessary. At the same time, however, it presents a challenge to learning and change: we humans have a natural resistance to change and a tendency to cling to our current meanings (Mälkki 2010; 2011).

If we want to overcome some of the limitations to learning and change brought up by the edge-emotions, then we need to learn to deal with the experience of the edge (Mälkki 2010; 2011; Mälkki & Green 2013). While the epistemological development would be the goal, the road to that development may require us to be more sensitive to the emotional aspects that stem from the ontological challenges posed by that development (see also Berger 2004; Meyer & Land 2005; Mälkki 2010). In the hope

of keeping up our image of ourselves as rational learners, we often wish to remove the unpleasant emotions from our experience before we have had time actually to live through, digest them, and hear what they wish to tell us. However, this often happens at the cost of limiting our cognitive functions to the automatic protection of our comfort zones, thus actually driving us further off from rationality (Mälkki 2011). Instead of being automatically oriented away from the unpleasantness at the edges of the comfort zone, we need to learn to recognize this pattern in our thinking (that is, of being automatically oriented towards the comfort zone). We may learn to offer the edge-emotions their own space in our conscious experience and accept and embrace them (Mälkki 2010; 2011; Mälkki & Green 2013). With this kind of acknowledgment and tolerance of the edge-emotions experienced in the passing moments of everyday life, we may be better able to enrich our rationality in thinking, deal with the edges of our knowing, support our own epistemological development, as well as rationality in thinking.

The above discussion explicates the premises of the anxiety we experience at the edge of knowing, how we may react to our anxiety, and how we may learn to negotiate the challenges at the edge. At the same time, the discussion shows the interlinked connections between cognition and emotion in learning and furthermore, exemplifies the need to recognize and explore in greater detail the interaction between the epistemological and the ontological tracks. The emotional and the ontological are not only "colorings of cognition," but also have a character of their own, which needs to be understood in order to grasp fully the processes of learning.

CROSSING THE PARALLEL TRACK: "WALK THE TALK"

At this stage, we feel that it is important to embed our theorizing in pedagogical practice. To do this, we have chosen to illustrate a technique relating to the "teaching" of a particularly complex topic. This example demonstrates some experiential methods used at the initial stage when student epistemological engagement is high. At this stage, an integrative approach of mind, body, and emotions is highlighted. High-level emotional engagement is then necessary in order to integrate the epistemological and ontological developmental tracks.

The knowledge base pertains to the complex history of the environmental movement, the largest global social movement to date. The complexity is perhaps clarified demonstrated by the following narrative. It is said that without doubt

> the environment story is one of the most complicated and pressing stories of our time. It involves abstract and probabilistic science, labyrinthine laws, grandstanding politicians, speculative economics and the complex interplay of individuals and societies. (Stocking & Leonard 1990, 4).

In this approach to teaching, we demonstrate the potential practical opportunities for the teacher to shift to the parallel ontological track of student engagement and open up possibilities for transformation.

Initial Epistemological Engagement

The pedagogical approach lends itself to students' understanding of complex knowledge in that it has a history or chronology involving global locations, i.e., a time-space complexity. Learning such complex topics by reading textbooks and attending lectures can lead to a struggle to organize events, people, times, and places in spatial-chronological relationships in the human mind. This pedagogical method describes a student experience that uses an integrative whole-person approach to epistemological development in that there is a cognitive, corporeal (bodily), and affective engagement with this complexity.

Working both collaboratively and alone, students first research basic facts about organizations, relevant laws, government departments, and significant background events. After several weeks of knowledge building, the students move to constructing a map of events and facts, a multiple timeline history. Their basic tools for this mapping are colored cards and directional arrows.

In this epistemological development process, students initially produce significant amounts of information, many alternative interpretations, and tentative theorizing. Different groups of students then **walk** (kinaesthetic-bodily understanding) the time-space lines and record what they say as they walk. Thereby, they create a plethora of narratives in this *viva* style assessment. The mapping and narrative creation processes are supported by the color-coding of laminated cards involving several dimensions: *laws*, *voluntary* organizations, and *statutory* organizations, specially designated sites that are themselves created by laws and so forth. To this, the students add *significant publications* as a literature base. The notion of a learning "journey" underpins this initial, essentially **epistemological**, **focus**. The next stage involves working with the students' emotions, both positive and negative, to support the students journeying towards new epistemological challenges at the edge of their comfort zone.

The Parallel Ontological Track

This learning experience creates many differing narratives, with multiple stories and interpretations: all are developed from an initial skeletal history of basic knowledge or "facts." As complex multiple narratives accumulate, so do opportunities for higher levels of critical analysis. The development and acknowledgment of multiple narratives, oppositional positions, political interpretations, and concerns over diversity and equity begin to surface. Industrialization and the differing consumptive patterns of global peoples are questioned, as is the destruction of wildlife and the planet: these issues begin to create strong emotional reactions, with the students taking different positions. Various critically reflexive positions require complex judgments and emotional engagement. Tutors can take students to the *edge* zone by working with emotionally-charged issues that challenge the students and that also have the potential to result in the reconstruction of their perceptions and beliefs.

Teachers can purposefully approach the **edge zone** by pre-locating difficult, complex emotional topics at the edge of the students' **comfort zone.** Topics might include:

1. **Gender**: the role of women in the global environmental movement, for example; why gender is largely ignored; differing gender perspectives.
2. **Violence, riots and campaign tactics and strategies**: the anti-globalization movement, the old guard (the National Trust, the Royal Society for the Protection of Birds) vs. new-wave voluntary organizations (such as Earthfirst!, Greenpeace), working-class or elite-class engagement, the voluntary sector as a *coherent force*, or factions and tribes.
3. **Population growth:** consumption of world resources by richer nations.
4. **Power and politics**: are laws created for the good of everyone, or are they for the good of landowners/ruling classes, "farmers" whoever they are, destroyers, and protectors of the land.
5. **Colonialism**: environmentalism as a **western phenomenon** in developed countries. (Taken from Beard 2010)

DISCUSSION

Transmission of knowledge is no longer the central approach to teaching in higher education. Teaching has shifted significantly to be more transactional and transformational. Student transformation, however, is a complex topic: along with greater recognition of the importance of the development of the student ontological self as the goal of higher education, there are calls for such an ontological transformation to be "brought into view, and engaged with" (Barnett 2007, 9). Engagement with the notion of transformation is the central purpose of this chapter.

Transforming students involves transforming ourselves as teachers: often teachers talk about student transformation from the viewpoint of teachers themselves as facilitators of the process. What is often left unsaid is that, whatever the demands or challenges for the students, there are consequences for the teachers as well, involving their role and the management of their own epistemological and ontological tracks (see also Mälkki & Green 2013). In the interaction between the epistemological track and the ontological track, emotions appear to be significant territory. Mortiboys (2002), writing about the development of emotionally intelligent lecturers, views the culture of higher education as largely an emotion-free zone. The splitting and privileging of the rational over the affective has tended to limit more integrative thinking about the experience of learning, yet emotions are fundamental to the development of the epistemological and ontological self.

We suggest that the student experience of epistemological development may be somewhat ambivalent. The reconstruction of knowledge through transmission and transaction with lecturers appears to be outside the self, because it does not affect the self. On the other hand, transformation involves a new and more profound positioning of knowledge in relation to the self. The deeper engagement with knowledge involves

a struggle, with students being taken to the edge of their emotional selves, which often involves less pleasant emotions such as anxiety or anger. Essentially, in the edge-zone, the self is challenged and ultimately reconstructed. Here we have sought to connect our theoretical position with a practical example of teaching a complex subject, highlighting topics whereby lecturers might steer students to the edge and into epistemologically challenging territory.

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2. SEMIOTICS AS A PHILOSOPHY FOR EDUCATION: FROM CONCEPTS TO SIGNS

INTRODUCTION

Traditionally, the philosophy of education has regarded learning as the acquisition of concepts. Here I will argue that we need to shift the emphasis from concepts to signs (concepts being types of signs) in line with a broader move from a strong mind-body dualism to the full recognition of people as embodied organisms. This has important consequences for viewing education as interaction, since signs are explicitly relational and rely on communication, whereas "concept" tends to imply something immutable and, ultimately, beyond interpretation and negotiation. Signs are never fixed in this way.

Meanwhile, Cartesian dualism, which allows for the separation of mental concepts from embodied interaction, still haunts educational thinking in a number of unhelpful and unnecessary ways, such as the long-running debate between behaviorist and cognitive approaches to learning or the question of the relative emphases that should be put on theory (as mental representation) versus practice (as physical embodiment) in learning to teach. Construing teacher training as a battle between, or even a combination of, theory and practice can seem particularly strange when we consider that what teachers actually "do" is often to describe, to explain, and, in effect, to theorize. A semiotic approach to teaching is not prone to such a crude bifurcation (Pesce 2010).

In this chapter, I argue that semiotic philosophy offers the most promising means of developing anti-dualist approaches to education by avoiding twin pitfalls, first, of idealist rationalism and second, of brute empiricism. Semiotics offers instead a rich empiricism that construes all behavior and action as experience, rather than considering thought and language as glosses on experience.

RATIONALISM

The rationalist tradition has not always been associated with a strong mind-body dualism. "Philo-sophy" in ancient Greek meant "love-(of)-wisdom," not merely love of logical thought, though modern philosophy, at least as practiced in leading universities, tends to this latter conception. To the ancient Greeks, wisdom, moral goodness, physical perfection, and rationality were indistinguishable: each was *arete*, the excellence that characterized the best way of living, leading to *eudaimonia*

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 37–49.

(happiness or fulfillment). Philosophers strove to attain this excellence; philosophy was its pursuit.

Most modern philosophers are not aretaic, however, but construe philosophy as "love of" reason or rationality, as one form of excellence among many, most of which are not the concern of philosophers. Analytic philosophers, who dominate modern philosophy, pursue the rational and logical through rigorous analyses of delimited concepts and issues, eschewing issues that seem diffuse and intangible. Noting Wittgenstein's famous remark that "Whereof I cannot speak, thereof I must remain silent" (Wittgenstein 2001, 7), some philosophers at least since Hume in the 1700s have become skeptical of whether logic can serve to resolve all issues in ethics, aesthetics, or metaphysics. The result has been that philosophers have avoided such issues. Thus, modern philosophy is generally limited in scope compared to that of the ancients.

The slide from universal *arete* to specific logic began recognizably with Plato's postulation of really existing conceptual forms, such as beauty and justice, the truths of which can ultimately be accessed only by those who have studied dialectic at the end of a curriculum that began with physical discipline and music and continued through mathematics for those deemed capable of following that far. Rationalism, the belief that the highest state of humanity is that in which universal truths are those which, properly understood, do not disclose themselves fully in human sensory experience, was reinforced through Descartes's *Cogito ergo sum*, albeit Descartes grounded his rationalism on the subjective, empirical fact of the thinking being (i.e., even if I doubt I exist, there is still an "I" that doubts my existence: Descartes 2010). Other than in the case of very strong idealists, such as Berkeley (1948–1957), who deny the separate existence of matter, but rather regard it as a manifestation of mind, rationalism assumes a substantial separation between mind and body.

While Cartesian mind-body substance dualism proved emancipatory insofar as it insisted on the rational autonomy of each individual, whether aristocrat or peasant, and was thus a significant force for social change in Europe and elsewhere, its unfortunate reverse was the tendency to see everything that is not mind (such as the body, animals, and the physical universe) as purely mechanical. Thus, we tend to think in terms of educating the mind, but merely training the body.

The flipside of idealist rationalism (the belief in the non-material mind) was classical empiricism, whereby raw sense data become the building blocks for thought. In opposition to Cartesian subjective rationalism, empiricism tends toward crude objectivism, whereby the entities and qualities we perceive are held to be merely inherent in the objects themselves.

EMPIRICISM

In the main, the same proneness to mind-body dualism is true of empiricism, at least as the term is understood generally in the post-Enlightenment scientific tradition. I shall refer to this from here on as thin empiricism, as opposed to the thick or rich empiricism that I associate with semiotics. Modern (thin) empiricism, developed by

Bacon (2000) and practiced by great scientists from the ages of Galileo and Newton onward, rests on the assumption that experience (as opposed to tradition, superstition, or authority) provides the test of truth. Semiotic perspectives generally embrace this. However, the scientific method is (justifiably) concerned with the validity and reliability of its methods, and this has resulted in "experience" being reduced largely to observation of entities that are considered to exist in and of themselves: experience has thus become what can be seen through the microscope or telescope or in the digital image and can be measured and recorded by an impartial observer whose personal characteristics (biases, moods, character, and so on) are of no consequence. (See Rorty 1981) Observation thus construed provides the "data" (note: the given), which can be patterned as phenomena and then explained as theory. Except in the case of the most radical empiricists, such as Hume (1748), who considered that the mind may be entirely the product of sense impressions, this power to supply pattern and give explanation must be provided by reason. Even Locke, who believed we are born as *tabula rasa* (Locke 1690) thought that the mind formed Ideas through Impressions. Empiricism's very commitment to material external reality requires some retention of a commitment to the Cartesian mind as an internal rationalizing agent. Thus, thin empiricism cannot do without reason, and the dualism is reinforced.

SEMIOTIC THICK (OR RICH) EMPIRICISM

Semiotics offers a safe passage between the Scylla of rationalism and the Charybdis of thin empiricism. There is not sufficient space here for even a potted history of philosophical semiotics. Suffice it to note that semiotics is, literally, the science of signs, and that signs incorporate words, images, and, indeed, anything that communicates. In effect, we understand our whole environment, both physical and human, in terms of what things mean to us, not merely in terms of what they, objectively, "are." Modern semiotic philosophy is grounded in both the American pragmatic tradition (Peirce and, to some extent, Dewey) and the French structuralist tradition from Saussure to the poststructuralists, including Deleuze and Derrida. For competing accounts of the history of semiotics, see Deely (2004) or Chandler (2013). For implications of semiotics for various aspects of education, see Stables (2005).

The most important aspect of semiotics for the present argument is that semiotics is strongly non-dualist with respect to mind and body. If living is a process of semiotic engagement, then what is real is both physical and humanly interpreted: there are not two kinds of reality, one external and one internal. A school, for example, is not determined solely by a set of buildings or by a mental interpretation. A school simply and really "is" first and foremost a school: the same set of buildings could stop being a school, and a school could exist on the same site without the existing buildings. What makes a school a school is that it signifies such. It is not simply a matter of a human mind interpreting a non-human reality; it is simpler still than that. Although we may never be able to know conclusively why a school exists, we can be sure that we experience its existence and that it exists within a historical and social

context, just as a particular word or phrase exists within a language and a particular utterance.

Acknowledging this leads to a reconceptualization of empiricism. It is no longer sufficient to study a school either by clarification of concepts related to schooling (the rationalist approach) or by using the methods of thin empiricism to collect data via the equivalent of the telescope or microscope. Rather, a rich, or thick, empiricism is required that understands the school as a collective and an individual experience in a much broader sense. It is no longer possible to separate what the school is (objectively) from how it is perceived (subjectively). Schooling is rather an intersubjective, relational set of practices, as is the human condition more broadly. It is on this basis that the argument proceeds, first by considering "reason" itself in the broader context of human experience.

THE PLACE OF REASONING IN A NON-DUALIST SEMIOTIC ACCOUNT

The mainstream traditions of both rationalism and empiricism assume a strong mind-body dualism. There is assumed to be a world of really existing physicality (rationally ordered according to the Laws of Nature) and a world of ideas that is uniquely human (and perhaps Divine), which enables people to understand and control the natural environment. Both traditions assume absolute reason.

It is important to stress from the outset that skepticism concerning absolute reason does not deny reasoning as a process. This will not be an argument against reasoning. Rather, it will be an argument against assuming the universal validity of any particular process of reasoning. On one level, to attempt to explain anything is to attempt to construct a rational argument about it. What is at issue in the debate about philosophical rationalism is not whether people rationalize, or even whether we rationalize to create the criteria for (rational) judgment of others' rationalizations: indeed, we inevitably do this; otherwise, we would have no means of making a judgment. (As Wittgenstein argued in *Philosophical Investigations* [1967], there can be no private language: all our thinking is rule-bound and conventional in some way.) Rather, the question is whether there can be a final, culture-free, transcendental form of rational judgment. Reason construed thus has absolute external validity: a rational argument, on this account, is not merely coherent in the sense of being fit for a purpose, but corresponds in some way to actually existing facts or propositions in the world both within and beyond human experience. This question is so important because whatever answer we can provide sets the parameters for what human beings are able and entitled to do, both to each other and to the non-human environment. Both ethically and epistemologically, the question is whether there is an ultimate Right and Wrong, the existence of which validates not only human accounts, but also human actions. There are only three possible answers to this: "yes," "no," and "don't know." It seems suitably cautious to operate on the basis of the third answer unless or until one can be convinced of either the first or the second, by rational argument, empirical evidence, or (better still to most modern

commentators) a combination of the two. Philosophy, on all accounts, should seek the answer rather than assume it.

Consider some common assumptions about reason in terms of this simple, but universally significant problem. These assumptions are:

1. Reason is the capacity to think reasonably and deliberately, in a considered, logical way, exercising good judgment.
2. Reason (in the natural world) is unique to human beings.
3. Rational structures relate to the real structure of reality beyond human perception and thus have universal validity, and so can reveal the laws or operating rules of the cosmos.
4. Reason is consciously exercised (thus, only human beings have consciousness).
5. Reason is transcendent, whether or not it is God-given.

Consider these five assumptions in terms of their internal coherence as a set. Two (2 and 5) are "two-world" assumptions: they suggest some conception of the supernatural, in the literal sense of that which exceeds the normal functioning of natural entities. No. 2 divides humans from animals; no. 5 liberates humans from material constraints; no. 1 implies coherent truth; no. 3 implies truth by correspondence. No. 1 is analytical (it simply redefines reason); nos. 2–5 are synthetic and inferential; 2–5 are also speculative: reason here is taken to be something that is not directly empirically verifiable. While supporters may find evidence for these assumptions, these cannot easily be tested through experiments that attempt to falsify them, so they are weak hypotheses according to Popper (1959), for example.

If we understand experience in a broader sense than that on which thin empiricism rests, then we can consider what our experience is of reason itself and its analogues. Evaluated empirically (that is, considering each in the context of everyday experience), nos. 1–5 might be reformulated as follows:

1E. Reason, as commonly understood, incorporates and implies one or more of the following: the capacity to think reasonably, deliberately, logically, and exercise judgment.
2E. We use the term "reason" to apply to what humans do and other entities appear not to do. To test whether other entities are actually capable of some of the things we consider reasonable would require both a tighter working definition of reason than is current and research techniques that have not yet been devised or employed.
3E. We can test whether (or rather, to what degree) our rational conclusions can serve as the means to effect change, as we perceive it, in both the human and non-human worlds. This can include the development and use of metatheories, such as the formulation of universal physical laws. As we are limited to our own perceptions of what happens, however, we cannot determine the degree to which such processes work because they are either self-referential or attuned to real extra-phenomenal processes (true by correspondence). We are limited

to determining what "works" or not according to criteria that may or may not themselves be valid universally. For example, we know that history has involved fundamental changes of mind about modes of human understanding, but we cannot tell whether our current understandings are objectively valid or will be subject to further radical overhaul.

4E. Consciousness is a contested concept, which is commonly taken to incorporate the sense a person has of himself or herself as a thinking being. However, there is no tight, agreed-upon definition, and thus no way of ascertaining definitively whether other entities can validly be held to be conscious.

5E. Reason appears to have some transcendent property insofar as human beings (at least) can make plans for currently non-existent situations, involving memory and projection. Note that this does not necessarily imply mind-body dualism. Note also that animals also appear to do this; the ability to combine examples of contextual knowledge to create new contextual knowledge does not necessarily imply a transcendent "view from nowhere" (Nagel 1986) characteristic of mindful human beings only. It is clear that animals do make associations and have expectations and memories, for example, and act on them accordingly.

In short, while we can analyze reason in terms of its apparent components and analogues (logic, judgment, etc.), we cannot empirically validate any of the loftier claims: that it is uniquely human, that it relates to the real structure of the extra-phenomenal world, that it is uniquely associated with consciousness or that it is transcendent. For instance, to return to an earlier example, while a certain set of buildings can signify a school only to human beings, this does not mean that the same buildings do not have signification value for non-human entities, such as the birds for whom a particular classroom roof might be a home. We do not need a uniquely human conception of absolute reason to allow for a uniquely human capacity to recognize an institution such as a school. We are on safer ground, therefore, in regarding reason as a social construct than as a prime mover. However, analytic philosophers, who tend to value the possibility of empirical justification over grand claims, are often dismissive of social constructionism. On the grounds that the latter is a vague concept, this is justifiable, but if the aim of philosophy is to determine and examine that of which we can be most sure, then constructionism trumps rationalism on this account.

Many of the claims made about reason are necessarily experience dependent. Without experience, no claims about reason could ever have been made. Reason is ultimately parasitic vis-à-vis experience, but this cannot always be tested through experience. Suppose you ask a carpenter to make a door. Both you and the carpenter know what a "door" is without having to show this through concrete examples. The Platonic rationalist argument is that there is actually an existing door form and that this accounts for our ability to talk to the carpenter. However, this is not a necessary prerequisite, for door-ness could simply be known through experience; the same holds true for beauty, justice, or education: when people argue that certain things that happened in school were not "real education," this can merely show, *contra* Plato,

that there are conflicts within the myriad uses and experiences of the term that cause us to question what we mean by it in a particular context. For this reason, abstractions such as justice, beauty, and education are really generalized from experience rather than prior to it. There is no compelling reason to believe, for example, that any other highly evolved life form would have any such concepts to share with us or even that *homo sapiens* has evolved with a stable set of concepts.

IMPLICATIONS FOR THE PHILOSOPHY OF EDUCATION

Contrast this with a strong expression of the analytic tradition within the philosophy of education, which makes selective use of experience to attempt to derive enduring definitions of key concepts, which can then be used as the bases *inter alia* for policy-making and teaching practice. It is tempting, but simplistic to base a definition of what education "is" on a selective and contextual analysis of ordinary language, rejecting (for example) uses of the term in phrases such as "that was an education!" after something unpleasant has happened, or as being ironic or invalid, as in Frankena's defense of Peters below:

> R. S. Peters has argued very cogently that, unless we extend the term education as Rousseau does, we would not say that X is educating Y if he is fostering undesirable and morally objectionable dispositions or using undesirable and morally objectionable methods; for example, if he is helping Y to form bad habits and false beliefs, or if he is using harmful drugs, brainwashing, or hypnotic suggestion (*Concept of Education* [1967], pp. 1–6). This seems to be correct. It is true we may say that what X is doing then is "bad education," but we would be more likely to say it is not education at all. Education is, normally at least, a laudatory term and its laudatoriness seems to be built into it. If one says that X is educating Y, one must be thinking that X is cultivating desirable and morally unobjectionable dispositions (excellences) by similar means. Education must foster dispositions and use methods that are desirable and morally unobjectionable, or at least regarded as such, otherwise it is not education. (Frankena 1973, 1).

Such a jumping at definitions through over-selection can lead to the analytics' fatal error, from the point of view of the present argument: assuming the Is and then deriving the Ought from it. In this case, it is questionable whether the Is is valid, for parties may not agree on the moral desirability of dispositions. How many non-Buddhists would argue that education should foster disillusionment, for example? It could, however, be argued that any learning involves seeing that what was held to be no longer is dis-illusion – literally. And what of people who claim in all seriousness that they did not learn much from their education? Such conceptual analysis is normative through and through: it is skewed by aspiration. The strong analytic approach takes clarification of the concept "education" as the first move to improving schooling on a logically coherent basis, whereby decisions

about the curriculum and teaching methods, for example, may be derived as logical expressions of the aims of education, which are themselves logically derived from clarification of the concept. I argue that such conceptual analysis cannot validly do this. First, it is impossible to derive all values from logical analysis, as in the case of "education" above. Second, different curricular practices (e.g., mathematics and social studies) are in effect different language games or forms of life (Wittgenstein 1967), whose aims do not necessarily cohere. For example, the concept of beauty may have one set of associations in aesthetics, but another set in theoretical physics, while "multiplication" may refer to making things bigger in everyday discourse, but can also include multiplication by fractions in mathematical discourse. These may be trivial examples, but they show how concepts are always contextually dependent for their meanings. In short, they show that concepts are signs within semiotic systems. Both epistemologically and ontologically, the sign takes precedence over the concept.

TOWARDS A SEMIOTIC RICH EMPIRICISM

Reason therefore operates through signs, yet sign use may or may not be, or appear to be, reasonable. We do not have the grounds on which to make final assumptions about the extra-phenomenal world from the cultural practices that drive our own experience, including the power to rationalize.

Appeals to absolute reason are therefore highly speculative. Less speculatively, we act according to what experience prompts in use, whether or not this prompting inspires (necessarily contextualized) reasoning or conscious reflection.

Implicated in the consideration of reason here is cause. Beware the fallacy of single causation, which assumes that there is an invariate relationship between identifiable single events in the past and the future. What experience prompts and what agents do can never be fully understood on a simple one-to-one level of cause and effect. Indeed, experience always being to some degree various, it is possible to state with some certainty that universal conclusions cannot validly be drawn from contingent premises. Reference to natural laws generally implies laws of predictability, but "universal conclusions cannot validly be drawn from contingent premises" is effectively a law of unpredictability. Given that the set of factors leading to an experienced event or its context can never be fully repeated, it is not possible to state with certainty the outcome of a set of conscious processes. History may often almost repeat itself, but it cannot ever repeat itself exactly.

This "law" is broken over and over again in areas such as educational policy and other forms of social planning wherein which outcomes of a particular identified set of circumstances are supposed to be repeatable. In fact, neither the circumstances nor the outcomes are ever fully repeatable. In the luxury of the scientist's laboratory, factors can be reduced to numbers that seem small enough to identify clearly and to handle in terms of experimental design. After significant reduction, the effect can be gained that a certain human intervention will always have the same outcomes.

The social world never offers such laboratory conditions (even accepting science as infallible, which is unlikely). Variables cannot be isolated, measured, and used to predict social or personal outcomes with anything like the degree of certainty often naïvely assumed by policymakers and those who advise them.

To the semiotician, experience cannot be simply atomized. Experiences are not singular, discrete entities and thus do not prompt singular, discrete responses. One's experience of a school, for example, is multifarious. Hence, "what to do" is not immediately self-evident. This results in the activity that we consider to be thought, judgment, or deliberation.

To say something is reasonable is, in this sense, always a *post-hoc*, *propter-hoc* argument. All we can say for sure is that, since Hume, experiences seem to follow from each other: thus we perceive causation and rationality. Rationality as a construct is ultimately experience dependent. Hence, it is the case for universal reason and not against it that demands proof. Plato's proof was weak. In the *Meno* (Plato 380 BCE), Socrates showed how an uneducated slave boy could perform mathematical operations that assumed an understanding of conceptual forms such as triangles. Socrates explained this phenomenon by arguing that the boy recalled the knowledge from the spiritual realm from whence he came, for he could not have known it through experience. However, one does not need formal education to have experience. The intelligence of the slave boy can much more obviously be explained by his induction into the culture of geometry and calculation all around him than by reference to a supernatural realm of everlasting triangles.

Semiotic philosophy cannot assume parallel worlds. In semiotic philosophy, the sign, and its operation, constitute the focus of inquiry. The sign takes primacy over the referent insofar as the referent is understood as an extrapolation from the sign rather than *vice versa*. A sign need not be just a word or anything consciously, humanly fashioned. It is indistinguishable from a signal; it is a prompt, whether it is a line of Shakespeare, the white cliffs of Dover, or, literally, a kick on the backside. (Note that signs are both one and multiple. Mathematics is a sign system, not the basis on which to evaluate sign systems.)

G. E. Moore, one of the influences on the development of analytic philosophy, promoted common sense realism by drawing attention to empirical facts that we should take for granted as indicative of objective entities (Moore 1925). He argued we should not cloud propositions, such as the earth exists and orbits the sun once a year, by quibbling that it all depends on what we mean by "the earth" and "exists" and "years": this, he believes, would be a misdirection of philosophy rather than an exercise of it, a charge of sophistry. However, this argument runs the danger of effectively preventing us from taking full account of minority interpretations. In a philosophy of education, counter views, such as that "education" need not be a force for good or that no "education" exists beyond people's experiences of it or that education often happens when you least expect it, can get squeezed out of the conceptual picture. These counter-perspectives do, after all, make things more difficult for professionals and policymakers. In effect, the strong analytic position

presented here closes down the definition of something through an appeal to the obvious on the unprovable assumption that the sign refers to an empirically verifiable external reality, whether in the form of a material object or a conceptual proposition, even if only because such certainties seem necessary. This can become a circular and self-serving retreat into the myth of the obvious: the belief that X is an obvious indicator of Y, rather than only obviously being X. It allows for wishful thinking: the subtle elision of the "is" into the "ought." Everything really does hang on "what you mean by," say, education. X indicates Y to one person at one time, Z to another at another time. Of course, in any community, assuming Y may win over assuming Z, but that falls short of absolute legitimation. There is considerable difference between one rationale dominating in a certain context and that rationale attempting to crush the other: look at the tensions between, among, and within America, Israel, and Islam. Consensual conceptual clarity in a given place or time about a term such as "education" fails to grant that term objective legitimation.

Consider God: the prototypical God-word. Usually, the debate begins with "does God exist?" At this level, and then through all its subsequent levels, this is a potential war starter. It posits a series of either/or decisions that are empirically unresolvable, yet have dramatic consequences for human interactions and for human interactions with the non-human world. It is put as though there is something – someone – out there (or there is not), which we must be right or wrong about believing in. This kind of simple binary thinking would not be adopted under a fully semiotic approach, which would begin with the acceptance that "God" is, first and foremost, a word-sign. In semiotic philosophy, the sign is prior to its referent; thus, it is what the sign evokes that is important, not what it objectively represents. Regarding "God," people use it as a word for a range of possible entities, from cosmic Prime Mover or ultimate judge to personal guide and imagined friend, while aetheists may wish to substitute "imaginary friend" for "imagined friend." (Note that the difference between these two positions seems much less great than on other issues.) As the referent, on the semiotic account, can only be inferred from the sign, rather than taking the sign as an expression of a taken-for-granted referent, there seems nothing here to fight over. After all, even within a single religious tradition, the word "God" is likely to evoke some variation in responses and associations. The important thing is that looking at it this way should not promote unnecessary human conflict. While we can never know all the interpretations or fully understand their provenances, we can be assured that they will endure to some degree and change to some degree, just as the sign "God" itself will: we know that even this word cannot be consistent between languages or across time. These interpretations can neither be undone nor everlastingly perpetuated, regardless of the degree to which a particular interpretation is defended or fought over.

A semiotic, non-rationalist philosophy therefore is relativist, although this need not imply anti-realism. The weakness of relativist positions is that they fail to offer criteria for judging between competing value claims. However, this point has already been addressed in Wittgenstein's Language Game argument (1967) (and elsewhere). There are no universally recognizable criteria, but each language game, and each

form of life to which it relates, manifests its own norms and values. Pragmatism is generally consistent with this: meaning is always meaning-in-use. On a fully semiotic account, everything is a matter of semiosis, of response in context, and no meaning adheres over the long term. (It is tempting to think that 2 + 2 always equals 4, but it is not true of either low or high values of 2: [1.6 × 2] should be rounded to 3; [2.4 × 2] to 5. Everett [2008] claims that the Pirahã people of South America have no arithmetic at all.)

This is true, *contra* Descartes, of the "I" which experiences. There are no complete adults fully equipped to teach incomplete children, for example. On this account, no dichotomies work as absolutes, with their terms always qualitatively discrete and fixed, but rather as pragmatic contrasts useful only in certain contexts: thus, there are occasions on which it is helpful to talk about mind or body or to differentiate between theory and practice, or adult and child, or expert and novice, but these terms do not represent discrete substances or even discrete practices in many contexts, so that often they are not helpful and are rarely helpful when taken as absolutes. For example, it is easy to forget, when contrasting body and mind, that these terms are merely used to contrast aspects of human action (such as when tennis coaches stress that it is a "mental game" or a garrulous person is criticized for not putting his brain into operation before he opens his mouth) or that the theory-practice division in education operates within the field rather than trumping it, so that both those committed to theory and those committed to practice are interested in furthering education. In educational discourse, while it may often make sense to contrast relatively theoretical discussion from concrete material actions (for example, theories about classroom management from the act of arranging tables and chairs), everything that goes on in education, intentionally or otherwise, has something of theory and something of practice about it, because every educational act or opinion is a response to education, and this is insufficiently recognized. A fully semiotic approach warns us against sharp divisions and prevents their use as argumentative shields, as when one party accuses the theorist of not understanding practice and the other accuses the teacher of not understanding theory. Semiotically, the challenge is always to respond to the other's response, which involves an attempt to understand it; there is no retreat from semiosis. There is no end point, and certainly no good reason to take any of the great philosophers as having the last word on any of these matters. Furthermore, semiosis always results in challenges to received views and contributes to personal change, and in this sense is always educational.

DISCUSSION

Let me conclude by setting forth briefly some basic principles of a fully semiotic approach grounded in a rich, or thick, empiricism under which "experience" incorporates all aspects of the human condition, including thought.

First, (contextual) reasoning is inevitable and inevitably involves deliberation and judgment. These capacities do not become redundant as a result of rejecting universal

rationalism. All judgment and deliberation involves "if – then" considerations. Since this is true even of a cat hunting a mouse, on this level, rationalizing is an inevitable aspect of life beyond the human. It is a survival imperative, but necessarily contingent and selective. Nevertheless, within my phenomenal world, many things "seem as if" more generally: it seems as if cats are natural hunters of mice, for example. However, as Hume argued, what seems like the expression of a natural law need not be so. In my experience, and in the experience of others I have encountered, cats hunt mice, but both cats and mice are likely to evolve or adapt in such a way that this practice does not continue forever. The force of the present argument is not to deny the consequential power of (particularly) human action, but rather to acknowledge its contextual dependency and, as a result, some inevitable unpredictability of outcomes. In short, reason is a function of semiosis, not the reverse. As has been acknowledged in Humean skepticism, analytic philosophy, and some versions of pragmatism and semiotics, human reasoning is always constrained and contingent. Therefore, to believe it could provide a complete Theory of Everything, for example, would be hubristic.

Second, semiotics and pragmatism both problematize the body-mind distinction and thus, by extension, the distinctions between theory and practice and between philosophical and empirical research. While in all these cases the distinctions are useful in context, none is absolute. However, it could be argued that this assertion depends on accepting the present argument as fundamentally empiricist. Perhaps so, but the appeal is not to the impoverished form of empiricism that reduces experience to measurable observations, in laboratories, and using telescopes, microscopes, and other forms of scientific instruments. Rather, our experience understood more fully is nothing less than our implication in the events and processes that, collectively, constitute the universe. Any research program that arises from such considerations must inevitably, therefore, include approaches that are conventionally considered both philosophical and empirical, as well as methods that are both qualitative and quantitative.

Ultimately, however, there must be recognition that research informs judgment, so that, in this important sense, the qualitative always trumps the quantitative. In relation to this, taking meaning as meaning-in-use means taking actors' experiences seriously, including (but not merely comprising) their perceptions in all endeavors. Thus, scientific research cannot divorce itself from either its ethical responsibilities or its dependence on culture beyond itself. Scientific research in education (for example) cannot validly comprise the disinterested collection of (merely) observable data, as if either such data or the theories that interpret them are context free and immutable. Rather, any study of educational domains requires awareness of the communicative practices and interpretive traditions in which key concepts are semiotically located.

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EETU PIKKARAINEN

3. FROM THE ONTOLOGY OF INTERACTION TO THE SEMIOTICS OF EDUCATION

INTRODUCTION

In the philosophy of education, there seems to be a shift towards an *ontological turn*. The purpose of this chapter is to contribute to the ongoing discussion by framing what the ontology for a philosophy of education could be and what it could offer. Some of the current literature in this movement will be reviewed briefly and critiqued for a too narrow and too shallow understanding of ontology and a lack of ontological seriousness. The task of ontology will then be concretized as the solving of fundamental problems in the philosophy of education. A solution to these problems will be sketched by introducing an alternative ontological theory originally developed by C. B. Martin. This solution is closely connected to the theme of this book because Martin's theory is essentially the ontology of interaction. Finally, it will be argued that one cannot draw practical conclusions directly from ontological theory: at the very least, a semiotic analysis of human interaction is needed.

WHAT THE ONTOLOGY FOR A PHILOSOPHY OF EDUCATION COULD BE

Ontology is a core area of theoretical philosophy. A common and useful delineation is to say that theoretical philosophy is divided into epistemology, the study of knowledge, and metaphysics, the study of reality as such. Furthermore, ontology is the most general area of metaphysics; it is the study of "being as being" – the most basic structure of reality (Loux 1998, 15). The concept of *category* is used frequently here; it usually refers to the most general classifications into which beings can be divided. Such classifications are typically objects or substances, properties, kinds or species, relations, events or processes, and the like. Ontological theories usually try to determine what categories there are and the formal relations between categories; for example, is one category dependent on another? (e.g., Loux 1998; Lowe 2001; Keinänen 2008).

After the empiricist critiques (especially Hume's), Kant's Copernican Revolution, and the rise of analytic philosophy, metaphysics lost its reputation for a time. In his *Critique of Pure Reason*, Kant tried to show that, although our knowledge of reality is structured categorically, those categories must reside only in the transcendental structure of our cognitive apparatus; we have neither right nor reason to claim anything about the structure of reality as such, even though that reality is the source

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 51–61.

of our knowledge (see Kant 1982/1787, the preface to the second edition). In the last century, metaphysics and ontology again became respectable areas of research, but, at least to begin with, only in a Kantian (or neo-Kantian) mode as a means of analyzing human ontological commitments. A leading figure here was P. F. Strawson (1959), who called his approach *descriptive* metaphysics (a description of *the* common and necessary way to think about reality) as different from *revisionary* approaches, which can only be either minuscule corrections to the descriptive theory or then perhaps beautiful, but unbelievable constructions, such as the pre-Kantian rational ontologies of Descartes, Leibniz, or Berkeley.

At the end of the twentieth century and continuing into the twenty-first, a renaissance of *serious*, revisionary ontology as the study of reality occurred, independent of the structure of our cognitive apparatus (e.g., Armstrong 1980). It became usual to redefine descriptive vs. revisionary differentiation so that both are situated as *serious* metaphysics of a mind-independent reality. However, descriptive now began to be devalued and restricted, while revisionary – generally taking off from the problems found in descriptive studies – endeavored to formulate new and better hypotheses about the basic structure of reality (Keinänen 2008). Of course, we have no way of evaluating these hypotheses empirically as is done with scientific hypotheses, but rather we must assess these instead using formal criteria (comprehensiveness, methodicalness, conceptual economy, and elegance) and perhaps indirectly by considering their helpfulness in solving theoretical problems unsolvable in other ways (Martin & Heil 1999, 49).

Thus, there are four possible approaches of ontology as the cross tabulation of two dimensions. First, there is the dimension of seriousness (reality as such) vs. non-seriousness (thoughts and commitments) and second, there is the dimension of descriptiveness (interpretive) vs. revisionism (inventive). The serious descriptive and revisionary alternatives have been briefly described above. The non-serious descriptive area could perhaps be thought of as a phenomenological analysis of ontological commitments. The last area of non-seriousness and revisionism is especially interesting and important for ontology in a philosophy of education. I would tentatively call it practical ontology, because it has a close connection to the questions of practical philosophy and is perhaps even thought to be based on values. (See Table 1.) The borderlines between these areas should probably not be stressed, but rather their interdependence and fruitful interaction should be emphasized.

So what can these areas or approaches offer the philosophy of education? If we accept that a philosophy of education is an essential part of the theory of education, a theory that should help us understand what education is – that is, what are we doing

Table 1. Different Approaches of Ontology

Object Aim	*Thoughts about being*	*Being as such*
Description	Phenomenological commitment analysis	Descriptive metaphysics/ontology
Invention	"Practical ontology"	Revisionary metaphysics/ontology

in education, what is really going on in education, and what decisions about the aims and tools of education are we to make – , then we can establish at least two important tasks for ontological research and reflection.

1. On the one hand, if we want our actions and pursuits in education to be at all rational, then we should check that our ontological commitments are consistent with our plans and activities. For example, we should not be striving for goals that we believe to be impossible in this world. And we should not be trying to influence objects or things that we really do not believe exist. Contradictory suppositions, even unconscious ones, can be compromising the efficiency of our efforts.
2. On the other hand, the consistency established between our ontological beliefs and our educational procedures may not be enough. There is still a danger that our efforts are doomed to misfire or achieve only haphazard success if our ontology does not hold in relation to the reality upon which we are acting. If we believe that some goal is possible to achieve and we strive for it with the most rational tools, we will still not achieve our objective if the goal is impossible because of the structure of the reality.

AN ONTOLOGICAL TURN IN THE PHILOSOPHY OF EDUCATION: ONTOLOGICAL WRITINGS IN THE PHILOSOPHY OF EDUCATION

Already some dozen of articles have been written (in English) since the dawn of the twenty-first century that explicitly address ontology or metaphysics in the philosophy of education All consider ontology extremely important to the philosophy of education and also to the practice of education, going so far as to suggest the phrase “ontological turn” in their texts or even their titles (Barnett 2004; 2009; Dall’Alba & Barnacle 2007; Pio & Varkøy 2012; Rømer 2013). Common themes in these papers are the values and aims of education (also Bonnett 2000; Brook 2012; Kristjánsson 2010), ontological commitments of educational research (Wegerif 2008), and especially the concept of dialogue and its ontological bearings in education (Dall’Alba & Barnacle 2007; Game & Metcalfe 2008; Packer 2000; Pio & Varkøy 2012; Wegerif 2008). A shared influence of Heideggerian phenomenological and existential ontology of human existence, being-in-the-world, come through powerfully (Dall’Alba & Barnacle 2007; Pio & Varkøy 2012). Of course, the orientations and arguments differ considerably among these approaches, but space does not permit here to do them justice with a more detailed analysis.

It could be said that the main concern that all the writers more or less share is practical ontology. They all suggest some special way of thinking about reality, a thinking based not so much on any serious ontological theory, but rather on practical and value-based views about the right objectives and aims of education. At the same time, the authors restrict their views to special metaphysical questions about human beings and values. None of them tries either explicitly or strongly to build bridges to any general serious and revisionary ontology (with the exception of Rømer 2013). As a tentative criticism of them, it could be said that first, they can

carry out the previously mentioned first duty of educational ontology, i.e., coherence and rationality of action, partly because they restrict themselves to very narrow questions. Second, many of them do not even try to respond to the second duty, which is to ask whether the reality is really such that our educational activities can affect it in the way we hope.

PRACTICAL PROBLEMS FOR THE ONTOLOGY OF EDUCATION

I will now turn to some of most pressing problems in the philosophy of education, problems that seem to be particularly in need of ontological analysis. These problems are strongly interconnected, as are all ontological questions. These also have a strong practical weight, because all are connected to the old problematic concept of freedom and determinism as counterweights. I will identify and differentiate the problems in this way:

1. Freedom of action: Is there really freedom of human action, which is required by our concept of responsibility?
2. Openness of individual development: Are students predestined for some kind of career in learning? What are the limits of teaching?
3. Openness to the future of society: Is the future pre-determined, and what restricts the possible changes?
4. Interaction: How can we affect other beings and events in the world? How are we ourselves affected?

We can start from the plausible assumption that all education is interaction. If we think of teaching as a special aspect of education, then we could say that in the interaction between teacher and student, the teacher tries to affect the student so that the latter would change in certain ways – a process we call learning. How is this possible and what happens in the process? How does this happen, given the general basic structure of the world? Responsibility of action is a central goal for many devoted teachers, especially in so-called moral education. The concept of responsibility not only contains the desire that an action be good, but it also encompasses the hope that the actor freely or autonomously (or at least *compos mentis*) chooses to act in the way she or he did. But does our science-bound ontology allow this kind of freedom if every event in the world is caused by other previous events (see e.g., Shabo 2011)? If this freedom does not exist, then the traditional ideas of pedagogy often referred to by the German term *Bildung* (Siljander, Kivelä, & Sutinen 2012)—such as the possibilities for a human being to master and transcend any cultural contents and for a society and for humankind in general to cultivate still better and more just social and cultural structures—are only vain hopes and pious words.

A sound ontology for the philosophy of education should answer all of the above questions as accurately as possible. The answer or answers should be such that they are not just *ad hoc* or custom-designed for educational needs, but must be based on the general ontology of reality as a whole. As such, these answers cannot, of course,

be detailed, ready-made solutions to the specific problems of educational theory and practice. Rather they can operate like general reflector planes against which the coherence and credibility of special solutions may be observed and by way of which educational views might be compared and connected to other areas of action and knowledge.

PROBLEMS OF UNIVERSALS AND DUALISM IN OUR RECEIVED ONTOLOGY

The Trap of Dualism

It has been popular to begin or to restrict the study of ontology or metaphysics to the debates between doctrines such as idealism, materialism, and dualism. The bitter controversy between materialistic and idealistic views has a long and well-known history in western philosophy. The doctrine of dualism is usually connected to the Descartes theory of human beings (1968, 156). However, as a combination of materialism and idealism, dualism is much older. What are these theories all about? There seems to be something in the world that is describable as material: concrete, extending, spatial, hard, soft, more or less inert stuff. On the other hand, there seems to be or at least there feels as though there is something different: our thoughts and ideas, values, feelings, and so on. Both of these somethings are difficult to deny, yet at the same time surprisingly hard to put into one and the same coherent picture of the world.

Today dualism is the object of a great deal of criticism in the philosophy of education, especially from semiotic theory (Stables 2010). There are many reasons. The first, of course, is that reciprocal interaction should be possible between the "material" and the "ideal." Minds should obtain knowledge and stimuli from material objects, and the mind's plans and intentions should give something in return. In addition, dualism seems to be a bad habit of thought: if we separate the ideal from the material, then we will probably also separate immanent and transcendent, rational and irrational, human and animal, culture and nature, adult and child and so on. Not only do we separate them, but we also put them in mutually exclusive spheres of reality, whereupon interactions and transitions between them no longer seem possible.

But can we step away from dualism? I claim that taking the side of either materialism or idealism will no longer do. We cannot deny the opposite side. We will always bounce back to some kind of dualism. Fortunately, we are not locked in this trap forever in ontology. The "material" and the "ideal" are just special cases of the so-called universals, perhaps the most universal of all. So let's see if all the universals could be thrown overboard.

The Problem of Universals

In ontology, it is usually assumed that at least individual objects or particular things exist, in short, *particulars*. You and I, this table and that pencil are particulars. Those

particulars which exist more or less independently are traditionally called *substances*. In addition to these particulars, there may be something else. The particulars seem or feel both similar and different in some respects. These respects can generally be called *properties*: particulars can have color, shape, size, and so on. For example, a pencil is sharp and yellow. Thus, properties such as yellowness and sharpness also seem to exist. Substances and properties are two candidates for the categories of ontological theories. There can also be other categories, but traditionally, ontologists have tried to restrict the number to a necessary minimum according to the central methodological rule called ontological parsimony, also known as Ockham's razor or qualitative economy.

Now, how can we explain that some particulars are similar? Things can be similar in two ways: a yellow pencil and yellow notepaper are similar because of their color, thus similarity according to one property. A yellow pencil and a red pencil are similar because they are both pencils, thus according to their species or kind. Ontologists who believe that the yellow pencil and the yellow paper somehow share a common or *universal* property of yellowness suppose that, in addition to particulars, there exists a special category of universal properties. Yellowness can be a member of this category. This stance of believing in the existence of universals is traditionally called *realism*, although universalism might be a better name (Simons 1994).

As is well known, the most extreme example of realism was Plato. For him, the universals—thought of as eternal and stable *ideas*—were the most independent, pure, and strongly existing of all beings. All the empirical particulars were derivative, unimportant, bundles of imperfect mirrorings of ideas. The ideas were hierarchically structured so that the highest were goodness, beauty, justice, and so on. This theory was thus practical; it provided values which empirical beings could try to attain or to imitate in their imperfect way. Aristotle did not accept the notion that ideas existed independently. He believed instead that they were always connected to particular substances. He also transferred the interest from individual properties to species as some kind of bundles of properties. For him, species were stable and eternal—no Darwin was yet in sight. Also for him ontology had a practical bearing: a species has an *essence*, that is, it is the whole of the essential properties of that species. The "duty" of particular members of a species is to mimic or realize the essence of the species as well as possible. My pencil is sharp; thus, it is a good pencil if sharpness belongs to the essence of the species of pencils. (See e.g., Armstrong 1980 for a classification of the main alternatives in relation to universals.)

As we can easily see from this not so impartial description, realism, at least in these core forms, is a very questionable starting point for educational ontology. It would easily lead to determinism, the pigeonholing of students, the view that there is nothing new under the sun, non-interactionist categorizing, and dualism. But this is not the main point. Realism is also a guzzling ontology with its excessive category of universals. Fortunately, there is an alternative to realism, and it is traditionally called *nominalism*. An extreme form of nominalism states that only particulars exist; not even properties in particulars exist. Particulars, however,

form classes of resemblance, and we can give those classes arbitrary names such as "yellow" or "pencil." Another, more interesting and fruitful form of nominalism holds that properties are something real and existing, but they are not universal. Instead, every yellow particular has its own yellowness, not a shared common and universal yellowness. These property particulars are often called *tropes* (Bacon 2008; Keinänen 2005; Simons 1994).

C. B. MARTIN'S ONTOLOGY AS AN ALTERNATIVE

Now on the one hand I have tried to convince the reader that the realistic (or universal) ontology is defective, both as a practical and as a revisionary ontology, yet on the other hand, there are real alternatives. Hence, I will next describe some central features of the ontological theory, which at the moment I believe is the best candidate for a sound ontology for a philosophy of education. Unfortunately, this theory does not have a proper name of its own, so I will call it C. B. Martin's ontology after its original developer (Martin 1980; 1997; 2002; 2008; Martin & Heil 1998; 1999; Heil 2003; 2010; Snowdon 2008). The theory can be classified as a trope theory, but it does not belong to trope bundle theories, which state that ordinary particular objects are only bundles of tropes and nothing else (Martin 1980; Simons 1994). In bundle theories, the properties are somehow independent beings, which just happen to come together to form an object. Martin, however, sees properties as particularized ways of beings of objects. Every property, i.e., trope, must be a property of some object, part of that object's way of being.

A central feature of Martin's view is what is called *compositionality*. This simply means that all objects can be thought of as wholes structured (or composed) from smaller objects. Objects are what they are because of the ways those smaller or simpler objects as its parts are and the structure or composition that those parts form. Larger wholes can be more complex and have more complex properties than the simpler parts, but they are always strictly on the same ontological level. So there are no separate levels of being and thus no need for a complicated and problematic concept of emergence. Simple and complex beings, of course, have different properties, but usually so do objects, which are just as complex or as simple. No ontological categories are needed to account for these differences, which can also be thought of as fully gradual. (Martin & Heil 1999; Martin 2008, 35–40)

Another feature of this theory, and definitely the most important, is Martin's view of properties, which is simultaneously *dispositional* and *qualitative*. Dispositions have usually been thought of as some special kind of property that is manifest only in certain situations, such as the fragility of glass. That fragility is manifested only when something breaks the glass. By contrast, a property such as the transparency of glass has been believed to be a quite different kind of property, one that is manifest all the time. These latter kinds of properties have been called qualities or categorical or occurrent properties. There are many views of the nature of these two types of properties and the relations between them. According to Martin, they

are not two different types of properties; rather, every property has a dispositional side and a qualitative side. For example, transparency is a disposition to allow light through, just as fragility is a disposition to break when struck, and non-fragility is a disposition to stay unbroken even when struck. (Martin 1997; 2002) So any object can only manifest those qualities for which it has dispositions; on the other hand, we can know about the dispositions of an object only after they have been manifested as qualities.

Strictly connected to the conception of properties is Martin's view of causality. An ordinary example of a causal event is that a property of one object affects another object so that a property of the latter changes. According to Martin, every manifestation of a disposition as a quality is a causal event, and every causal event is an interaction. For example, a grain of salt has a disposition to dissolve in water, while water has a disposition to dissolve salt. Now when we put a grain of salt into a glass of water, these dispositions manifest in both objects so that salt dissolves and water becomes salty. Thus, causality takes place between objects, not between events. The manifestation requires something to trigger it. In a simplified case, we could think of two disposition partners like those of salt and water, which reciprocally trigger the respective dispositions in each other. In reality, the interactions can, of course, be more complicated, so that the whole environment of an object affects the manifestations of its dispositions. (Martin & Heil 1998)

An especially useful feature of Martin's theory is its applicability to the philosophy of the mind (Heil 2013, chapter 6). Plainly put, there is a clear parallel between simple causal events and human experience. The latter, of course, is compositionally more complex, but ontologically these are on the same level. When you see a yellow pencil, it triggers, as a disposition partner, a manifestation of your disposition to see a yellow pencil. That quality manifested in you of seeing a yellow pencil does not need to be qualitatively similar to a yellow pencil—at least in as little as these words "yellow pencil" are qualitatively similar to a yellow pencil. All causal interactions are in principle similar to mental representation: The causal effect of disposition partner A takes place in disposition partner B in a way that is strongly dependent on the dispositions of B itself.

This point has some remarkable consequences. In principle, any causal interaction cannot be told apart from an information change, while every causal effect contains a kind of (instantaneous) "interpretation*"* from the point of view of the dispositions of the object of the effect. Thus, *force* is not the best general metaphor for causal interaction. Physical events of causation and human experience are ontologically on the same level, but compositionally perhaps as far from each other as it is possible to be. This view does not mean reductionism: physics cannot explain problems of psychology or education without changing itself into psychology or the science of education. Neither does this denote materialism (because nominalist cannot be materialist) nor panpsychism (Martin & Pfeifer 1986). But now we know that there is no special mystery in the mental existence of humans—in addition to the normal mystery of the existence of reality as a whole.

DISCUSSION

Education is a semiotic interaction, but how on earth is it possible for this to be? Are the four practical problems solvable in the light of our new ontology? We have seen that every being with its dispositions is capable of being and doing far more than it is and does. Moreover, beings can change. They can grow bigger and acquire more and more complex and miraculous properties. Human beings are perhaps the most complex beings of all with infinite possibilities for changing their way of being. What is possible for a society depends only on us—and on other beings. We can never know whether some aim is impossible until we try to attain it. Afterwards there is still an endless number of other chances to try in another way. Yes, and we can teach each other and turn to dialogue. Perhaps it is even easier to do that than to cease from teaching and influencing each others, if we just remember that all learning takes place in action and that all action is interaction.

But the hardest philosophical problem is still the freedom of action as a precondition for responsibility and as an ultimate goal of education. Is freedom really possible? I cannot, of course, give a final answer here, but perhaps some speculations may be in order. First, we must remember that no being is fully determined by its environment or by previous events, but responds to its environment from the basis of its own dispositions. Human beings with their mental representations are still less dependent on their environments than other beings, because humans can create, that is, they can remember and imagine environmental effects that do not exist at the moment or at all. But in the end, is it possible for a being itself to cause events so that they are not determined by previous events? This is perhaps not so important a question as has been thought, because causality is not part of the relations between events. Event is a derivative being based on the causal interaction between substances. One interaction changes the situation, and thereafter other interactions are possible. So a succession of events does not determine a happening, but rather makes it possible.

The possibility of freedom is based on the possibility of a being to change spontaneously or to remain unchanged. This is a plausible possibility (Martin & Heil 1999, nt 4). Of course, this spontaneity is not the same thing as having freedom of human action as an ultimate goal of education, but it is a precondition for the possibility of such freedom. Such freedom can be thought of as the ability to take part in the creation of new rules of action, based more or less on the old rules, and try to obey them. These rules are connected to the structures of societies and the contents of cultures and are under continuous reconstruction as new problems and new solutions appear and are produced. This semiotic process—*Bildung*, if you will—could, if anything, be the ontologically-based essence of education.

I should still stress that from this general ontological background, we cannot draw anything or at least much in the way of practical conclusions. All principles and knowledge about methods, contents, and aims of education require special historical, phenomenological, and hermeneutical research—and especially semiotic analysis (Pikkarainen 2010; Semetsky 2010; Stables 2005).

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4. EXAMINING THE RESEARCHER'S POSITION THROUGH ITS INTERACTION WITH METHODOLOGICAL AND ETHICAL PARTICULARITIES OF RELIGION AND GENDER

INTRODUCTION

This chapter examines the researcher's position through its interaction with the methodological and ethical considerations of the research process. The examination is based on two studies, each of which considers growing-up processes within one religious minority community in Finland: Kuusisto's study (2011) on the experiences of growing up in affiliation with Seventh-day Adventism, and Rantala's ongoing study of the processes of the subjectification of women within the Conservative Laestadians, a Laestadian movement that is part of the Finnish Lutheran Church. More precisely, we are looking at the interplay between the location of oneself in a field of study and the effects of this positioning on the methodological and ethical considerations under scrutiny throughout the research process. Thus, interaction is understood here in a broad sense as describing the process in which the researcher, the methodology, and the relationship to the studied domain are entwined.

Studies examining religious communities in Finland are scarce, especially those that include gender perspectives (Vuola 2010; Kutuniva 2003; Hintsala 2012). Furthermore, when it is a question of people's personal worldviews, these do not hold a strong position in the public sphere (Riitaoja, Poulter, & Kuusisto 2010). The situation can also be seen in the research literature: in contrast to international studies, "religion" in Finland is seldom listed among such defining "variables" as race, class, culture, ethnicity/nationality, or sexuality, through which gender or womanhood is categorized. Within and between these categories, there is a need to recognize diversity and differences, especially in connection with the examination of gender. Although historical and cultural specificity have been distinguished and their importance to studies of women and gender recognized, the significance of religion is lacking in these studies. (Vuola 2010)

In the following pages, we present our methodological and ethical considerations in relation to the position of the researcher in the field and to the research process. Through this investigation, we hope to illuminate the ambiguity and fluidness of this position. We start with a brief introduction to the main concepts used in this chapter, followed by a presentation of our methodological framework and an examination of

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 63–73.

the particular considerations related to the researcher's position as such. Finally, we present some of the ethical considerations related to the researcher's position and the studied domain.

By *growing-up processes*, we mean the coming of age within, or in affiliation with, the social context of a religious minority denomination; by continuously navigating between memberships and identities, by negotiating one's values within this context (Kuusisto 2010; 2011), and by engaging in processes of subjectification. In post-structuralist terms, this means a constant "emerging" through the material and discursive effects of social life and society (Butler 1990; Davies 2000; Davies et al. 2001; Deleuze and Guattari 1987; Kosonen 1996; Rantala 2012; Ronkainen 1999).

Community is understood here as a research context or the milieu of the researched domain; it is not an actual inhabited place or a physical or social setting in which people exist at a particular place at a particular time and with a certain history. Rather, for our research participants, community often refers to the object of their personal sense of belonging, such as a particular religious group and denomination. Here the sense of belonging can also be understood as a strong sense of inclusion in a collective, as well as part of the theorizing on ethnicities in which the narratives of difference in relation to "belongingness" are seen as a rather discontinuous movement between identification categories (Anthias 2002). Belonging is further understood here as an active process that varies in intensity in the ways in which one's religion and faith are practiced (e.g., Kuusisto 2011).

The main focus of this chapter is on the *interaction* between the researcher's position, methodology, and ethical considerations in the research process. Interaction is understood as an entangled collection of processes in which the researcher's position, ontological suppositions, methodologies, and ethical contemplations are in constant interplay. Because these notions are somewhat inseparable and bound together, the examination of their interconnectedness requires special attention.

This chapter explores the specific aspects of growing-up processes and subjectification in the areas of religion and gender. Religion and gender are seen as embedded and entangled in the social and societal life of communities. Since we are presenting two different studies here, we bring to this chapter a meta-level of examination in order to analyze the methodological and ethical considerations of the researcher's position. The full research data will thus not be specifically analyzed here, but extracts will be used to illustrate our methodological and ethical perspectives.

THE RESEARCHER'S POSITION IN INTERPLAY WITH METHODOLOGY

Methodological and Positional Underpinnings

Our research methods include participant observation, surveys, and interviews that examine the growing-up processes among Adventist young people (Kuusisto 2011), together with writing assignments and a collective biography of women in

the Laestadian communities in various places in Finland. As a continuation of the writing assignment, a group biography project has been established, which will enliven and enrich the written experience through collective reminiscing, reading, and writing. As for the basis of inquiry for each method – the writing assignment and the collective biography – womanhood and the growing-up processes are examined through the concept of subjectivity in light of feminist and poststructural theory. (Beauvoir 1962; 1989; Butler 1990; Braidotti 1991; 2002; 2003; Davies 1993; Davies et al. 2001; Kosonen 1996; Ronkainen 1999) *Womanhood* is viewed here from the perspective of women of different ages in relation to the significance of experience. *Experience* is understood as memory, the recollection of past events, through which the subject is constituted while engaged in different forms of material and discursive powers and effects. (Bergson 1910; 1911; Deleuze 1988; Davies 2000; Ramazanoglu & Holland 2002; Skeggs 1997) The importance of experience is highlighted in studying a "subject" through a feminist perspective, while remaining aware of the subject's debated and questioned position as the basis for inquiry (Ramazanoglu & Holland 2002; Saresma 2010).

In studying rather sensitive and personal matters of gender and of growing up in minority religious communities, we consider it essential to strive to open up the researcher's position for inquiry in order to locate the researcher momentarily in a certain place and a certain situation from the one in which the inquiry is being done. Although as a subject who speaks, acts, and writes, the researcher can be seen as being continuously positioned differently in the world she inhabits, she still momentarily "brings history as a subjective being" to the present situation (Davies 2000, 89–90; Davies & Harré 1990). However, locating is also an imperative for the reliability of the research in terms of presenting the ontological, epistemological, and methodological foundations of the study (and of knowing) at a particular time. Locating the researcher in time and place, even temporarily, forms a fundamental part of transparent data construction, because we thereby locate where, when, and how the asking, the hearing, and the understanding have taken place during the research process. The way we know is partly visible in our assumptions and materializes in our study methodologies. (Kuusisto 2011; Ramazanoglu & Holland 2002; Rantala 2012; Skeggs 1997)

To illustrate the underpinnings for locating the researcher in the process of inquiry, we present our own positions as examples. As researchers, both of us have strong connections to the religious communities studied here through our family histories. This can work as a significant advantage for gaining access to the communities and for building trust with the participants. However, having a personal history and connections to the studied domain does not necessarily mean that a researcher is better able to understand the experiences and processes and thereby has an advantage in approaching the "knowledge" under study (St. Pierre 1997). On the contrary; if understanding of an experience or process were to be gained through familiarity, then it would make experience and "knowledge" seem universal, collectively shared, and widely known, as if there existed a pre-discursive truth waiting to be explored (see Foucault 1972).

Instead, viewing our positions as complex and manifold in interaction with the entangled contradictory encounters, just like the processes under study here, we as researchers cannot claim that our connections enable us to do more than enter the domain and carry out an inquiry. Furthermore, our inquiry into the "familiar" can be regarded as exploring "the already-known." Yet to our way of thinking, the reality is quite the contrary: the situation can be viewed merely as a subject entering unknown territory. This approach is also closely connected to feminist ethnographic inquiry, which endeavours to make familiar the strange and nomadic in order to examine it (St. Pierre 1997; Tolonen & Palmu 2007). Nevertheless, the familiar and the already known cannot be entered, since no such things exist; the places and milieus keep moving away and escaping us, even as we try locate them. This idea should be kept in mind as we unravel "the already-known"; the changes once experienced through shifting time, place, and encounters have no fixed essence through which we can view the world. (St. Pierre 1997; Deleuze 1988)

Particularities in Studying Gender and Religion

The researcher's position can be understood as fluid, one that shifts during the research process, particularly when different methods are used, including (autobiographical) writing and collective biography (Davies 2000; Davies & Gannon 2006; Haug et al. 1987) and participant observation and ethnography (Cetrez 2005; Honkasalo 2011; Kuusisto 2011). Thus, the researcher's position is seen to shift in intensity and duration, depending on the phase of the research and methods as much as on the interaction in the domain being researched at the time. Moreover, in comparison to "actual physical encounters" with the writers or interviewees, the researcher could be seen as materializing through writing instructions or through survey or interview questions, just as in reality, encounters are different every time (Davies 2000).

In studying the experience of growing up and the subjectification processes in these domains, rather than focusing on the religious "community" or the significance of "culture," we are specifically focusing on the multitude of ways faith and gender are intertwined in experience. Feminist researchers have long pointed out the bias and the absence of value neutrality in science in general (Rosser 2008, 54). As a result, as Ramazanoglu and Holland (2002) write from the feminist research perspective on experience, knowledge and social reality cannot be seen as emerging separately. Quite the contrary. They can be understood to stem from the same intertwined root that has both the subjective and the objective points of view within a subjected being. Based on this argument, the researcher's changing positions can be understood as including both perspectives, since they appear to evolve from the subject's changing reality. This is important to emphasize, especially in studying a singular experience. A singular experience is often acknowledged as an insufficient base for scientifically-valid knowledge; even if constructively problematized and transparently expressed, it is often recognized as valuable only through a struggle. (Ramazanoglu & Holland 2002)

To emphasize the value of feminist argument through the validity of experience, we want to demonstrate the particularity of each experience and the significance of religion and gender in these processes of growing up. Below, we will illustrate this particularity based on extracts from women's writings in our data. This is not to accentuate having women's "actual voices" (see Jackson & Mazzei 2009), but rather to illustrate the multiplicity and yet the subtleness of the differing fragments in the construction of growing-up and the subjectification processes. The excerpts have been taken from the participants' writings on an open-ended questionnaire filled in by mothers of teenagers affiliated with Adventism, as well as writings of women belonging to the Laestadian movement.

In these texts, religion was often referred to through the subject's faith, whereby faith was depicted as the source of trust and reliance. One of the mothers wrote about her faith and conviction thus: "Safety comes from God alone (a sense of security)." (Kuusisto 2011, 110) In a similar way, a young woman illustrated her faith as a solid structure in her life: "I have my faith as a safe pillar on which I can lean whatever life brings. I desire to wander in this kingdom, hold on to its wise words, advice, and teachings, and see them as enduring, even if present time calls for something different." (Rantala's data, 2012)

Faith was often described in these women's writings as an inseparable part of existence. Here another mother defines her faith as one of the most fundamental and vital elements in her life: "Faith is like the air that I breathe: you do not come to think of that. It is a part of me, like my heart is." (Kuusisto 2011, 109)

The entangled structure of faith and gender is also depicted in the examination of the subjectification processes. Faith and gender are seamlessly engaged, so much so that they seem to construct one another, as a young woman insightfully concluded: "Faith is the force of my womanhood." (Rantala's data, 2012)

The interwoven structure of the growing-up processes, faith, and gender puts pressure on the interaction between the researchers' position and methodological and ethical considerations. We therefore need an understanding and appreciation of the importance of religion as one of the main foundations in women's lives, furthermore, to be able to view religion a condition subject to change. As researchers, we need to be open and sensitive to the matters brought up in discussions of faith and gender, even though these may contradict our own views and assumptions. This requires consciousness of own fundamentalities, which form the base of the ontological and epistemological assumptions of our inquiry and which can also be depicted throughout the study. (See Lappalainen et al. 2007; Ramazanoglu & Holland 2002).

It is important for the inquiry, however, to be able to grasp the particularities related to faith and to community as religious, social, and institutional. In reporting our study, it is of essential importance to emphasize consideration in using statements that might bias the group memberships or the community by including such sensitive matters as premarital sexual relations or substance abuse and distinctive characteristics through which an individual could be recognized in a small community. Therefore, the researcher's position can be perceived here as

comprised of the shifting locations and the aspects of both proximity and distance, since locating the researcher occurs through the continuous struggles in the domain studied during the research process. (Kuusisto 2011)

ETHICAL CONSIDERATIONS OF THE RESEARCHER'S POSITION AND METHODOLOGY

Setting out to understand the significance of religion and gender in the growing-up and subjectification processes means entering arenas that are often considered private. Therefore, our emphasis is constantly on the ethical considerations involved in the methods used, the subtleness of the inquiry, and transparency in the presentation of the process. There is a request for transparency in presenting the ontological and epistemological research questions, since the questions work as the basis for the methodology used. The researcher should consider such questions as how (or whether) social reality and its processes can be understood, how religion and gender are "constructed" in the study, and how people make sense of their experiences of religion and gender and processes in the research. We consider these profound questions to be vital and fundamental in striving for an open and ethical inquiry. The need for such questions derives from feminist methodology, wherein knowledge (of social life) is understood to be tied to place, time, and other circumstances in which one's life has evolved. The knowledge thus has to be established and justified, because there is no certain absolute knowledge or truth to be found against which we can measure. (Ramazanoglu & Holland 2002)

To achieve an ethically sustainable inquiry, the researcher needs to position herself in the research domain, define her position, and be open to the ontological assumptions and methodologies to be used. The position and the approach demand an ethical unfolding of the premises, locations, and concepts used in different stages of the research. Through this unfolding, it is possible to take into account matters that are in danger of being overlooked or neglected in the research process. This is closely linked to the researcher's position and her power to outline and define the foundations, concepts, and aims of the research. (Ramazanoglu & Holland 2002, Skeggs 1997) There are struggles and juggling acts – attempts to balance the effect of the changing (discursive) positioning on the researcher, as well as ways in which the researcher is moving into new and evolving spaces made available by the changing positionings. The shifting locations as well as struggles over the aspects of proximity and distance have to be clearly pointed out and expressed in the different phases of the research.

As a method, a writing assignment does not necessarily include interaction with a research domain in the traditional sense. In contrast to ethnographical research, where the researcher is present in the domain, in a writing assignment the researcher's presence comes "in" through the instructions given. Ethnographical research enables the researcher to construct a deep knowledge and understanding of the studied field and its social and material circumstances. (Berg 2010; Gordon & Lahelma 2003;

Honkasalo 2011; Kuusisto 2011; Tolonen & Palmu 2007). The aim of a writing assignment is not to know and describe the social and material circumstances of the field as such; rather the interest is in the writings themselves and women's embodied experience in the form of text (Davies 2000).

In the writing assignment, there is a specific task to which the writer is guided by questions on a given theme. The writer is constructing the text from her experience and knowledge at the instant and present moment of writing. Since the text can also be understood as an entity with a life of its own, it no longer works as a response to the researcher's assigned task or as the experience or life of the writer. The ethical interest involved in the researcher's position and the interaction with the methodological issues can be found in the continuous interplay with the given instructions, the writings, and the researcher's reading of other texts within her momentary position of knowing. (Deleuze & Guattari 1987) With a writing assignment as a method, the other important ethical issue to take into account is the effect of both the instructions and the questions on the production of the text. Both the instructions and the questions influence how women write, even though they also write the way they learned to write, as they believe they are expected to write, and based on their embodied knowledge of writing at the moment they are in the process of writing. (Cixous 1993; Davies 1993; Davies et al. 2001; Davies & Gannon 2006, Wyatt et al. 2011) Thus, the emphasis here is on the active lives and experiences of these women as depicted in their writings. We have also made an attempt to concentrate on the singular experience as a basis for collective knowledge. In producing the writing assignment and the collective biography, we endeavored to explore the usual in our embodied lives, which are entangled with the surrounding world. We also wanted to move away from binary categories, such as the personal and the singular experience or the public and the collective experience, by giving writing new meaning through the subject, the body, and memory. (Davies & Gannon 2006; see Haug et al. 1987) The process of writing, as with any research method that involves "rewriting" the past, can bring recollections and affects into the present. The process therefore requires building mutual trust and finding a subtle way of working with the data (Denzin 1989). These issues are especially highlighted in an examination of religion, gender, and growing-up processes, which are usually viewed as private areas in a secular and societal context. (Kuusisto 2011).

DISCUSSION

Our purpose has been to develop more subtle ways of describing a growing-up process that is engaged with gender, religion, and religiousness in diverse groups and places in the Finnish society. Studying the growing-up processes within religious communities using a feminist approach gives special meaning to particularity and difference. As we have pointed out, each subject has a unique connection to community and to belief, so the differences are not to be taken as distinctive features of religions, religious groups, or communities; neither are such features

the characteristics of minorities or otherness, but rather they represent the various ways that people experience their growing-up processes in connection to gender and religion. Thus, the differences are subtle and can be partially seen through particularities and multiplicities. Examining faith and gender as part of a growing-up process is also an attempt to make sensitive matters clear and accessible to inquiry.

The validity as well as the objectivity of the research are discussed and argued in a feminist inquiry, especially wherein experience is used as the basis for scientifically-valid knowledge. As pointed out above, experience and knowledge, while linked to the researcher's position and to the nomadic nature of experience, also bring fresh and valuable perspectives to educational research when used to examine growing-up processes in various domains. Bringing the struggles and challenges of locating the researcher into the research process and keeping the process open for inquiry are parts of a methodologically transparent study. After all, each researcher comes to the field not only with a particular history, but also with certain characteristics, such as gender, ethnicity, and age, which are of significance in the social encounters involved in carrying out the inquiry. The particular situation of an inquiry, with its people, place, and time, has an influence on the participants and through this affects the way the data are constructed and the research is made possible. All of these elements can be seen as equally dependent on how the participants regard the researcher's position and whether they assume that mutually "shared" trust and understanding is possible in the encounter.

In studying growing-up and subjectification processes in religious communities, sensitivity and openness are essential. Thus, in this part of the research process, the insider perspective is questioned; experience and knowledge are brought to the study in the form of particular values and presuppositions—in order to raise ethical questions about the researcher's position and the possibility of knowing. As we have seen, knowledge formation is also of a collective nature, constituted in the moment of study in an entanglement with the multitude of different agents, milieus, and times. The concept of interaction in this research can also be understood as an entangled collection of processes in which the researcher's ontological and epistemological assumptions are bound together. Here knowledge of the subject appears to evolve from the lived and embodied reality of the subject at the time. The knowing is always located there where we know and what we know and is influenced by the methods and theories used; therefore, questioning the foundations of epistemology becomes relevant. (Davies 2000; Ramazanoglu & Holland 2002; Skeggs 1997)

Because we do not view the researched domain and its processes specifically from either within or outside, but to some extent both, we intend to examine these issues to the fullest through our different encounters and depict their present details from our altering locations and routes in the course of the study. The "communities" of research being pluralistic, and changing—rather than a fixed and static known quantity with certain characteristics—make the researchers' position equally

multifaceted. This multiplicity also emphasizes the necessity of understanding the research process in various ways, i.e., the process of writing the study, which could be viewed as an attempt to bring clips of that fluid "living entanglement" into the public sphere for discussion (see Barad 2007).

In that sense, the question of legitimizing the knowledge that emerged in the study is not a question of the validity of an objective investigation as much as it is a question of our ability to bring out a detailed, subtle, and ethical understanding of the studied processes as they momentarily surfaced. As in writing, this effort demands that the researcher seizes and captures moments, people, and time as an act of holding them in place and time for the sake of "preserving" them for description. The researcher is obliged to seize "life" and the "living" in words, while including or abandoning precious details as part of the process of investigation (Cixous 1993).

This chapter has been written in a process of interaction between two researchers, both of whom share an interest in studying religion as an important part of growing up and of subjectification processes. Despite the differences in methodologies and in the ontological and epistemological standpoints, we have endeavoured to see the growing-up process as specific, diverse, and universal, dependent on multiple circumstances, specific times, and individual encounters. We have thus conceived our positions as researchers as fluid, ambiguous, and open to multiple interpretations. After all, when we are located, dislocated, and continuously relocated in different ways, we may find an aspect of interplay among these changing positions, including the changing history of "others" and ourselves, as well as the common ground we share, which too is ever changing.

In closing, we hope that this chapter has offered some perspective and posed some new questions on different levels. From the methodological and ethical perspectives, we have wanted to enrich the understanding of the interplay between the researcher's position—one that is fluid and continuously changing—and a multitude of other elements in the research process. In terms of educational research, we wanted to illustrate the density and distinctiveness of the growing-up process as something that is shaped in the interplay of faith, gender, and subjectivity. Because we see these structures as being interwoven, we as researchers need to be aware of our own assumptions related to ontological and epistemological positions and questions. Furthermore, our research makes an important contribution to the very limited research literature on religion and gender as part of growing-up in western societies by giving particular weight to the intertwined structure of religiousness, faith, and gender (Kuusisto 2011; Rantala 2013). Finally, we wanted to make a contribution to feminist research through our educational research, in particular with a study that combines perspective of gender with perspectives on religious belonging and faith as important parts of growing up and subjectification. Through these viewpoints, we have posed some questions and have endeavoured to increase understanding for those, both researchers and professionals alike, engaged in issues of diversity in different multicultural educational domains.

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PART II

EMPIRICAL STUDIES OF EDUCATIONAL INTERACTION

HEIDI HARJU-LUUKKAINEN & JOUNI VETTENRANTA

5. THE INFLUENCE OF LOCAL CULTURE ON STUDENTS' EDUCATIONAL OUTCOMES

INTRODUCTION

All adolescents are closely connected with their living environment, which influences their lives and learning in many ways. For example, individuals' mental functions develop in interaction within different social, historical, cultural, and institutional contexts. In these environments, we can find different cultural features that have an impact on students' educational outcomes. For example, in the PISA 2009 assessment for the Swedish-language schools in Finland, 10 percent of the variance among students in reading literacy scores could be explained by the index of parents' economic, social, and cultural status (ESCS) (Harju-Luukkainen & Nissinen 2011). There are also many other studies in which educational outcomes are associated with cultural factors (see e.g., Carbonaro 1998; Israel et al. 2001; Schlee et al. 2009; Castillo et al. 2011; Sun 1999; OECD 2010a; Bernelius & Kauppinen 2011).

In this paper we take a meso-level perspective on education and learning and focus on the wider social contexts in which people interact and live. We believe that this interaction in the cultural contexts of different areas localizes, to some extent, the learning outcomes of individuals (see e.g., Coleman 1988; Bernelius & Kauppinen 2011). Our aim in this paper is to find and identify, if possible, areal accumulation of learning outcomes in Finland and look for similar areal patterns in different assessments. We will focus on the educational outcomes of Swedish-language schools and take a closer look at three different areas in Finland.

We examine the Swedish-language schools that participated both in the PISA 2009 assessment and in the School Health Promotion Study (SHPS) during the years 2008–2009. Concentration on the same schools makes the results more comparable. As regards PISA, we examine the data pertaining to reading literacy. As for SHPS, we focus on data related to students' knowledge of intoxicants and issues of sexual health. The areal variation and the performance groupings, as well as the SHPS factors are studied by means of a spatial statistical method called "kriging" (e.g., Isaaks & Srivastava, 1989), discussed below.

A CULTURAL APPROACH TO EDUCATIONAL OUTCOMES

Social capital can be defined as the collective benefits that individuals achieve when they interact. Even though different researchers view social capital from different

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 77–90.

perspectives, the main idea is that social networks have an impact on those involved. On the one hand, the culture we live in is connected with our social capital. On the other hand, different networks have different cultures, which produce different types of social capital. This in turn influences students' learning situations, for example.

The term "social capital" can be traced back to John Dewey's writings, but his definition has been reshaped during the course of its long history. Nevertheless, social capital can still be seen as a major concept in many different types of research conducted in economics, sociology, political science, and education (see Ferguson 2006). In much of this research we can see social capital viewed from either of two perspectives or from both: a family's influence on an individual's social capital and/or the community's influence on the individual's social capital. Even though these two interrelated areas are often distinguished, both affect individuals to some extent.

Defining social capital and its relationship to educational outcomes is problematic, owing to the complexity of the phenomenon. It is difficult to define what culture is, how the culture influences individuals, and how big an impact culture has on educational outcomes. Rothon and Goodwin (2011, 698) have attempted to outline the definition and complexity of measuring social capital using four qualities and how these relate to individuals' educational outcomes. These authors believe that:

– Social capital is about relationships
– Social capital is best seen as the property of individuals
– Social capital is not a universal good and can have both positive and negative outcomes
– A strong theoretical grounding is needed to test social capital empirically.

An individual's networks therefore, whether seen from a micro- or a meso-perspective, are of importance for developing his or her social capital. Plagens (2011, 40) argues further that, in today's terms, social capital is an intangible resource that emerges – or fails to emerge – from social relations and social structure. He also thinks, as do Rothon and Goodwin (2011), that not all networks provide the same benefits, and not all norms are equally influential in individuals' decision-making. Therefore, within these networks one can find different school performances, but at the same time measuring the social capital is highly problematic, basically because of the complexity of the phenomenon:

> Within communities, social capital refers to both individual and group variables. The presence of these variables to a greater degree positively influences levels of social capital, which in turn can facilitate formal and informal modes of collective action, as well as forms of spontaneous individual action. One outcome of collective and spontaneous individual action can be higher levels of student and school performance. In this sense social capital is a mediating variable that lies between the actions of individuals and outcomes. (Plagens 2011, 52)

There are many studies in which the educational outcome is associated with cultural factors (Carbonaro 1998; Israel et al. 2001; Sun 1999; Schlee et al. 2009;

Bernelius & Kauppinen 2011). The focus of these studies has mostly been on the family's influence on the child or adolescent. By contrast, how or to what extent the community's social capital influences individuals has received less attention. According to Morrow (1999), the impact of friends, social networks, and activities in the community should be taken into account in youth research. This was the case, for example, in a longitudinal study conducted by Israel et al. (2001). The authors found that both process and structural attributes of a family's social capital are key factors affecting high-school students' educational achievements. In addition, a community's social capital helped youths to excel, but here the connection was not as strong. Similar results were also found by Sun (1999), who determined that a community's social capital is consistently associated with performance, even after controlling for a family's social capital and demographic factors. Even though some contextual effects were modest in scope, they were highly consistent in pattern and associated with the performance of students in the community.

Family naturally plays a central role, especially in the educational outcomes of young children (Schlee et al. 2009), yet this is also the case with older students. Castillo et al. (2011) found a strong connection between parental educational/occupational level and the cognitive performance of Spanish adolescents. In Finland, the Swedish-language schools have shown poorer educational outcomes in both national and international assessments by comparison with the Finnish–language schools (Harju-Luukkainen & Hellgren 2013; Harju-Luukkainen & Nissinen 2011). The reasons for these poorer results have not been fully explained, but researchers have drawn attention to several reasons. For example, the cultural context and especially family-related variables have been pointed out as possible explanatory causes (Brunell 2005; Dall 2012; Harju-Luukkainen & Hellgren 2013). On the PISA 2009 assessment of Swedish-speaking students, several factors were found to explain differences in their reading performance, and some of these were related to students' social capital. Not surprisingly, the factors explaining most of the between-student variance had to do with reading activities: enjoyment of reading, awareness of the most effective strategies to understand and remember a text, diversity of students' reading materials, and usage of different reading-related strategies. All of these were naturally bound to a student's cultural environment in one way or another, but the economic, social, and cultural status (ESCS) of students played a central role. Approximately 10 percent of the variance in students' reading performance could be explained by this index, which comprised information from items dealing with students' wealth, cultural position, home educational resources, as well as books at home, together with parents' occupational status and educational level. Altogether the above-mentioned factors explained approximately 55 percent of the variance in the Swedish-speaking students' reading literacy scores (see Harju-Luukkainen & Nissinen 2011). Also Bernelius and Kauppinen (2011) have pointed out that students' socio-economic status in their living area can have an effect on educational outcomes.

We can often find connections between variables, but exactly how they are connected to each other or to an individual's social capital and educational outcomes is more

difficult to define, especially when the phenomenon is complex. In some contexts, social capital can have a positive influence on learning outcomes, while in another context the influence can be negative. Therefore, instead of looking at nation-wide results, a meso-perspective on educational outcomes could be preferable. Moss, Girard, and Haniford (2006) described educational measurement as a cultural tool situated in a larger institutional, social and national context. They pointed out that interpretations of student performance on these tests must be made with attention to local context.

THE SWEDISH-SPEAKING MINORITY IN FINLAND

There are two official languages in Finland: Swedish and Finnish. The majority of inhabitants (90 percent) are Finnish-speaking, and the minority (5.4 percent) are Swedish-speaking (SVT 2013). Most of the Swedish-speakers live in Finland's coastal areas, some of which are close to the influence of Sweden (see Figure 1e). Geographically, the Swedish-speaking population forms a fairly united group among the Finnish-speaking population. There are also so-called linguistic pockets in Finland, where the Swedish-speaking population lives virtually in isolation within officially monolingual Finnish-speaking cities.

According to the Finnish Constitution (Ministry of Justice 1999), citizens have the right to use their own language (Finnish or Swedish) in official matters with authorities. Moreover, the government shall provide for the cultural and societal needs of the Finnish-speaking and Swedish-speaking populations of the country on an equal basis. This has led into two parallel educational systems in Finland: the Swedish-language system and the Finnish-language system, with similar resources and guidelines that form the basis for the teaching in both school systems. The schools also have equal governmental or municipal organizations. Essentially, the only practical difference is that, in the Swedish-language schools, the instruction is given in Swedish and the teachers are native speakers of the Swedish language.

Apart from the language of instruction, the Swedish-language schools differ culturally from the Finnish-language ones. For a minority group, the schools are of crucial importance in the formation of students' cultural identity in Swedish-speaking Finland. But how do these cultural aspects differ in these parallel educational systems? Mansikka, Holm, and Londen (2013) interviewed 26 Swedish-speaking teachers and came up with four distinctions characterizing the Swedish-language schools and their culture. Along with the use of the Swedish language at school and at home, they found Swedish speakers to be more social and more communal. They also found that the Swedish-speaking minority had historical and traditional common ground in which schools played an important role.

The linguistic landscape of the Swedish-speaking population differs from that of Finnish speakers. According to Folktinget (2007), the language landscape of Swedish-speaking families has changed dramatically in the last several decades. Previously, the majority of the Swedish-speaking families in Finland were monolingual. Today there are many bilingual families in which the parents speak Finnish and Swedish

to their children. According to Herberts (2009), two-thirds of Swedish-speaking Finns in the Helsinki metropolitan area reported that they speak Finnish perfectly or almost perfectly. Further, according to Kumpulainen (2010, 23), in the year 2009 approximately 3,500 children attended the first grade in a Swedish-language school, but only 3,200 of them were registered as Swedish speakers. The linguistic landscape of the Swedish-speaking population can also vary dramatically from one part of Finland to another (Eriksson et al. 2011; Kovero 2011). This means that the Finnish- and Swedish-language cultures are not only interacting, but also intertwining in many bilingual or even monolingual Swedish-speaking families in Finland.

There is also one, perhaps surprising, differential factor between the Finnish- and Swedish-speaking populations in Finland, which has an effect on educational outcomes. Minority groups often have a lower socio-economic status compared to the majority group (OECD 2010b). In Finland, the Swedish-speaking minority has a somewhat higher economic, social, and cultural status than the Finnish-speaking population (Harju-Luukkainen & Nissinen 2011). This may well be one of the many reasons why so many Finnish-speaking families choose a Swedish-language school for their children in Finland.

THE PISA 2009 ASSESSMENT AND THE SCHOOL HEALTH PROMOTION STUDY (SHPS)

In this section we take a closer look at two assessments: the PISA 2009 and the School Health Promotion Study (SHPS) in the years 2008 and 2009. PISA measures the proficiency of 15-year-old students in three domains – reading, mathematics, and science – in three-year cycles with alternating main domains. A total of 65 countries participated in the PISA 2009 assessment.

Usually the Swedish-language schools in Finland are assessed with their own weight in both national and international assessments, which makes the samples too small for further analysis. In PISA 2009, the Swedish-language schools participated with a larger sample, with a total of 1,407 students. This larger sample allows a more precise examination of the results for Swedish-speaking students and regions in Finland.

The main domain in PISA 2000 was reading literacy, in PISA 2003, mathematical literacy, and in PISA 2006, science. Reading literacy was again the main domain in PISA 2009, and two-thirds of the testing time was devoted to this assessment area. For that reason, the focus in this paper will be on reading literacy.

OECD (2010a, 23) defines reading literacy as a broad set of cognitive competences, from basic decoding to knowledge of words, grammar, and linguistic and textual structures and features to knowledge about the world. It also includes meta-cognitive competencies: the awareness of and ability to use a variety of appropriate strategies when processing texts. PISA 2009 outlined reading literacy as:

> Understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society. (OECD 2010a, 23)

Reading literacy is seen here as a multidimensional domain and not all of its aspects can be covered in assessments such as PISA.

SHPS is a classroom survey of students' health, health-related behavior, living conditions, and student welfare services; it has been carried out in Finland every spring since 1996. Half of the country's schools are supposed to participate in the study annually. In SHPS, responses are given anonymously and cannot be traced to individual students; SHPS and PISA data cannot therefore be connected at the student level. At the school level, however, these data can be connected (see Luopa et al. 2010). Thus, to begin our study, we selected from the 2008–2009 SHPS data the schools that participated in the PISA 2009 assessment.

The previously selected SHPS sample consisted of answers from 176 schools and 16,401 students in 2008–2009. Of these, 46 schools were Swedish-language schools, which, with 3,280 Swedish-speaking students, made up our final sample for this paper. These data had not previously been examined from the perspective of Swedish-language schools or regions. In our assessment, we focussed on students' knowledge or awareness of intoxicants and sexual health. These indicators are each composed of six dichotomic claims (true/false or I don't know):

Statements measuring knowledge about sexual health:

– Getting her period is a sign that a girl can become pregnant.
– Of all contraceptives, only a condom protects against sexually transmitted diseases.
– Sexually transmitted diseases can sometimes be asymptomatic.
– A woman cannot become pregnant on her first intercourse.
– Ejaculation is a sign that a boy is sexually mature and can conceive children.
– Inflammation caused by chlamydia can lead to infertility.

Statements measuring knowledge about intoxicants were the following:

– Smoking makes the skeletal system more fragile.
– So-called light cigarettes are less harmful to health than other cigarettes.
– Taking snuff improves physical performance.
– If young people get drunk regularly, it hampers their memory and hinders learning.
– Possession of alcoholic beverages is forbidden for youths under 18.
– The same amount of alcohol raises the blood alcohol level equally for a man and a woman of the same weight.

If the student answered incorrectly or did not know the answer to three or more claims, the student was categorized as poorly informed or having poor knowledge about the content area. This proportion of students was then used as a school-specific index for each content area. This is also the reason why, in this paper, only percentage values are presented for SHPS results.

Applying the Kriging Method to the Data

For perceiving possible regional or areal variation among school observations, we used the kriging method. Kriging is a geostatistical interpolation method based on the

statistical relationship among the measured points' spatial autocorrelation. Kriging weights the surrounding measured values to derive predictions for unmeasured locations according to the distance between measured points, the prediction location, and the overall spatial arrangement among measurements (McCoy & Johnston 2001).

In this study, plausible values from the PISA 2009 data for reading literacy, SHPS indices, and their standard errors were estimated at the nodes of a square grid of 10 kilometers × 10 kilometers over the entire area of Swedish-speaking Finland. The estimation is done by kriging, based on the five nearest neighbours (the schools that participated in the PISA study) weighted by distance. School averages and school-specific indices were used in that estimation. Predictions were weighted by distance only, not by any student or school value. Corresponding contour maps were produced for visual observation. This method allowed us to remove the effect of individual students and single schools, as well as any possible variation among background factors among them from the spatial variation. Thus, we could observe the purely regional variation. The final results are surfaces that indicate the randomly located school's randomly chosen student's expectation value of the observed factors; i.e., "If there were a school in that location, what would be the expectation value of a student in that school?" It is also important to note that the color of the different areas or raster cells does not tell us anything about the significance of the different areas. The statistical significance of the difference between predictions can be estimated by the prediction standard errors calculated during the kriging process. For each 10 by 10 kilometer raster cell, a prediction and prediction standard error were estimated.

RESULTS

Contour Maps of Swedish-Speaking Areas in Finland

In this paper the primary results are presented using contour maps. Figure 1e shows the whole of Finland with the Swedish-speaking coastal areas shaded in gray. This Swedish-speaking part of Finland is the target area of this paper. Figure 1a presents the results of a spatial distribution analysis of an ESCS index, while Figure 1b presents the score points of reading literacy on the PISA 2009 assessment. Figures 1c and 1d focus on the results of a spatial distribution analysis of SHPS. Figure 1c shows the percentage of students with poor knowledge about intoxicants, and Figure 1d shows the percentage of students with poor knowledge about sexual health-related questions in the Swedish-language schools.

In this paper, we look closely at three different areas. These areas are shown in circles in each of the figures 1a –1d. These areas were chosen after the contour maps were drawn on the basis of the spatial distribution analysis. Below, we present the more detailed results of these three areas on the basis of the contour maps in Figures 1a–1d.

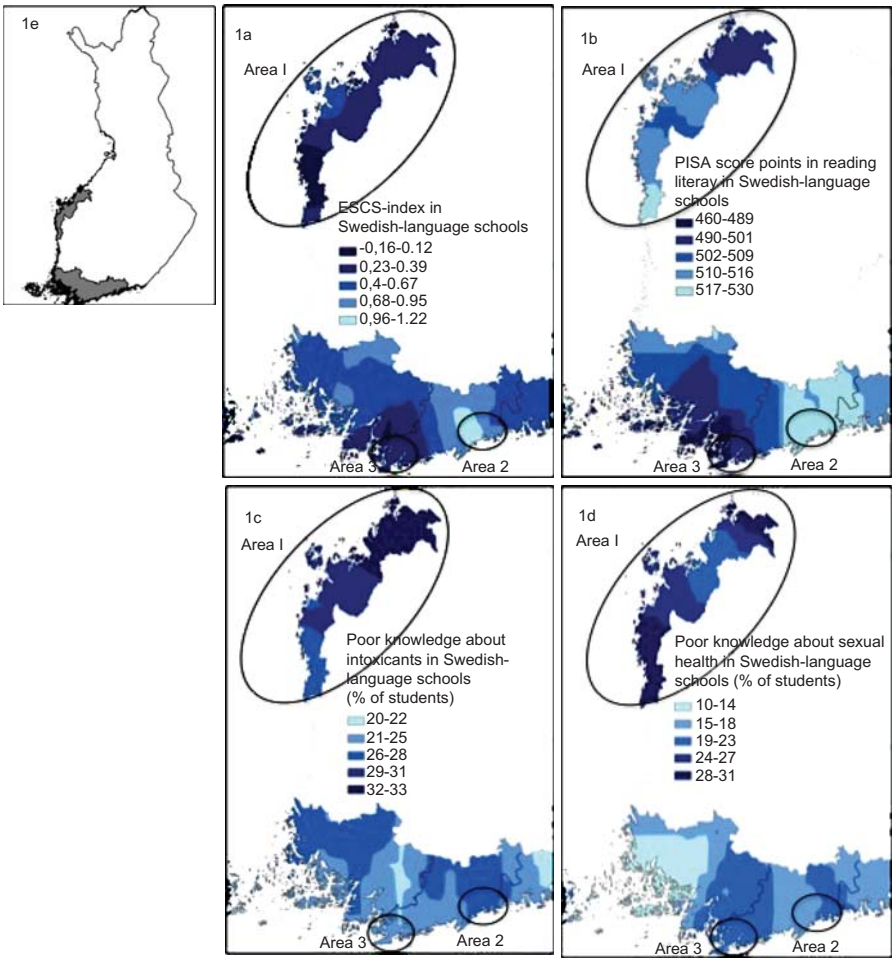

Figure 1. Results of the spatial distribution analysis of the ESCS index (1a) and the reading literacy score points (1b) on the PISA 2009 assessment. Results of spatial distribution analysis of students' poor knowledge about intoxicants (1c) and sexual health-related questions (1d) in a school health promotion study in Swedish-language schools in Finland (1e).

Observations from the Contour Maps

The three regions selected differ from each other in the density of the Swedish-speaking population, the geographical position in Finland, students' economic, social, and cultural status (the ESCS index in the PISA 2009 data), and the proximity of a large city.

Table 1. Summary of ESCS index and reading literacy score points on the PISA 2009 assessment as well as percentages of students' poor knowledge about intoxicants and sexual health-related questions in SHPS in Finland.

Assessed area	*PISA 2009 ESCS index*	*PISA 2009 Reading literacy*		*SHPS 2008–2009 Intoxicants % of poorly informed*	*SHPS 2008–2009 Sexual health % of poorly informed*	
	Mean	*Average*	*N*	*%*	*%*	*N*
OECD countries	0	493				
Finland	0.30	536	6415	19.3	16.6	16401
Finnish Finland	0.29	538	5008	17.9	15.6	13121
Swedish Finland	0.52	511	1407	26.9	19.3	3280
Area 1 Ostrobothnia	–0.16–0.19	460–530	400	26–33	19–31	1361
Area 2 Metropolitan	0.95–1.22	510–530	286	26–28	10–23	759
Area 3 Raseborg	0.13–0.39	460–501	121	20–25	19–23	388

The first region observed was Ostrobothnia (Pohjanmaa in Finnish), the northernmost region of Swedish-speaking Finland. About 50.4 percent of the inhabitants in Ostrobothnia have officially registered Swedish as their mother tongue (SVT 2013). This fact makes the area predominantly Swedish-speaking. The area is also the largest of those observed for this paper and includes roughly 30 percent of all Swedish-speaking Finns in the country. The ESCS index in this area is high in the city region of Vaasa, but decreases the further one goes from the city region (Figures 1a and 2a). On the ESCS index, the OECD average is 0 and the standard deviation is 1.

The second region observed was the metropolitan area, which encompasses four cities: Helsinki, Espoo, Vantaa, and Kauniainen. In this area approximately 6.1 percent of the inhabitants are registered as Swedish-speaking Finns (SVT 2013). This accounts for about 20 percent of the Swedish-speaking Finns in Finland. In the metropolitan area, there is also a relatively high ESCS index (Figures 1a and 2a).

The third region observed is called Raseborg (in Finnish, Raasepori), and it is fairly close to the influence of the metropolitan area. In Raseborg approximately 65.6 percent of the inhabitants are registered as Swedish-speaking Finns, which makes this area also predominantly Swedish-speaking (SVT 2013). The area includes about 6 percent of the Swedish-speaking population in Finland. Here the ESCS index is low compared to many other Swedish-speaking areas (Figures 1a and 2a).

According to the results of the School Health Promotion Study in Ostrobothnia (area 1), there were more students with poor knowledge about intoxicants as well as about sexual health-related questions than in other Swedish- language schools in Finland (Table 1, Figures 2c-d). On the PISA 2009 assessment, the average scores for these schools on the reading literacy scale overall varied between 460 and 530

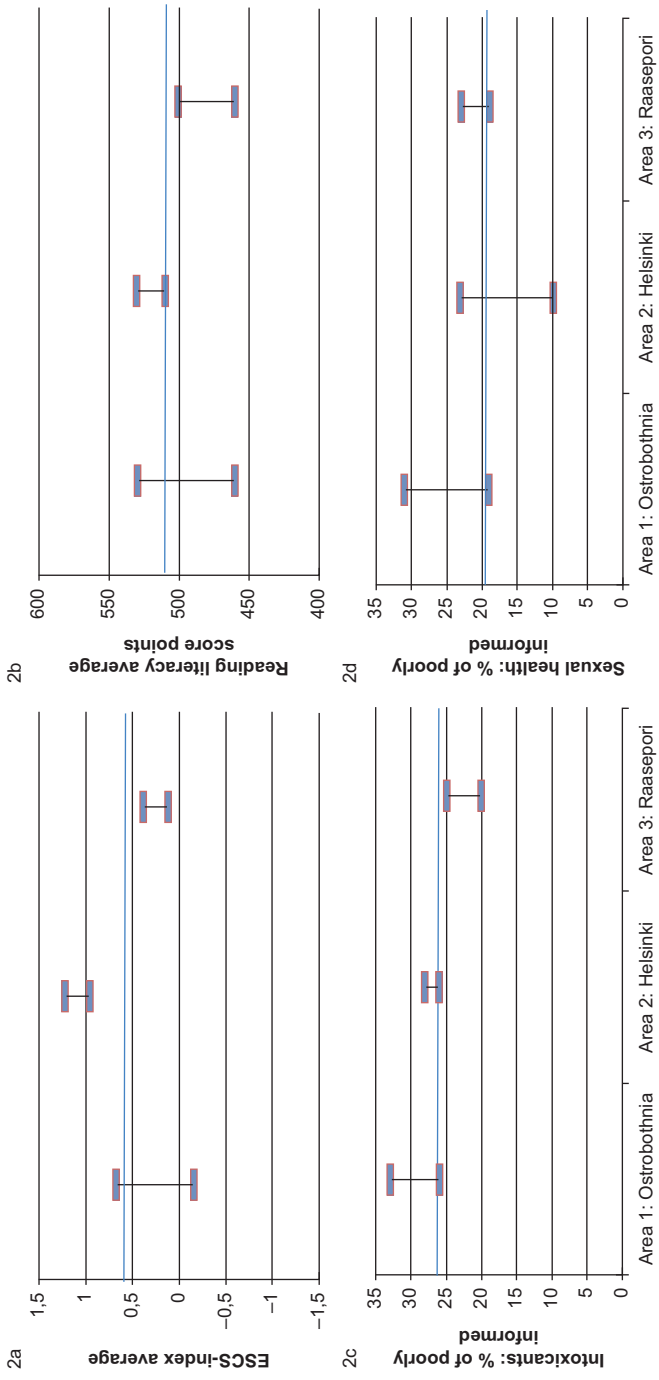

Figure 2. Range in the three observed areas and the average of Swedish-language schools. Figure 2a presents ESCS index, 2b reading literacy score points, 2c percentage of poorly informed students about intoxicants and 2d percentage of poorly informed students about sexual health-related questions.

score points, with the most being between 460 and 516 points (Table 1). This means that, although internationally above average, the students in this area were mostly below the average of the Swedish-language schools in Finland (Table 1 and Figure 2c). The reading literacy average score also differed appreciably in different parts of Ostrobothnia (Figure 1b). Likewise, the ESCS index in this area was lower than the average (Figure 2a). In sum, the results of the whole of Ostrobothnia can be considered mostly lower than the average in Swedish-language schools for all studies (Figure 2a-d).

In Region 2, the metropolitan area of Finland, the results of students' knowledge about intoxicants and sexual health-related questions varied (Figure 2c-d). The students' knowledge of intoxicants was close to the average in Swedish-language schools. In turn, there were fewer students with poor knowledge about sexual health-related questions. In the PISA 2009 assessment, students in the metropolitan area nearly exceeded the average in Finnish language schools on the reading literacy scale overall (Table 1). This can be considered a relatively high reading literacy outcome, both nationally and especially internationally. The ESCS index in this area was also higher than the average (Figure 2a). In sum, the results in the metropolitan area can be considered in general high or average in all studies (Table 1, Figures 2a-d).

In the third region, Raseborg, there were fewer students with poor knowledge about intoxicants than average (Table 1, Figure 2c). As for knowledge about sexual health-related questions, more students could be found above the average (Figure 2d). This means that the students were better informed about intoxicants, but more poorly informed about issues related to sexual health than an average student in a Swedish- language school. On the PISA 2009 assessment, the points scored in this area in reading literacy overall were lower than the average (Table 1, Figure 2b). This is far below the national average, yet fairly good in comparison to the international norm. Students' ESCS index measures, however, were lower than the average (Figure 2a). In sum, in the Raseborg region, the results varied to some extent in the different assessments, but were on the lower side (see Table 1 and Figures 2a-c).

In sum, all three regions had distinct profiles in terms of their educational outcomes: one was rather strong in all studies (region 2, the metropolitan area), one was relatively poor in all studies (region 1, Ostrobothnia), and in one the connection between the different outcomes was not that evident (region 3, Raseborg). The results from the three regions also differed significantly statistically speaking. In reading literacy, all results differed statistically significantly ($p = .05$). In SHPS, the first region (Ostrobothnia) differed significantly from the third (Raseborg) in both SHPS indices ($p =. 05$). The metropolitan region, in turn, differed significantly from the first region (Ostrobothnia, $p = .05$) only in students' poor knowledge of intoxicants. Nevertheless, there appeared to be a connection between the educational outcomes assessed and the regions in which the students lived. How strong this connection is is difficult to say on the basis of this analysis. Further analyses are therefore needed in which a wider array of variables is compared.

DISCUSSION

We can assume that the social environment in which people live and interact, viewed from a meso-perspective, plays a role in students' educational outcomes. The results of our analysis suggest that there is a connection between student achievement in the two assessments (PISA 2009 and SHPS) and the region, i.e., students' living environments. In our analysis, we took a closer look at three different Swedish-speaking regions in Finland. Each had a distinct profile in educational outcomes on both assessments. One region did well in all studies, one did rather poorly, and in the third, the results were somewhat varied. This type of connection between educational outcome and living area, but from a socio-economic perspective has been reported in Finland previously by Bernelius and Kauppinen (2011) and Himola (2013).

These results naturally raise questions about cultural context and people's interaction in these contexts. Further, they raise questions about the impact on students' educational outcomes. What could be done to improve educational outcomes in low-achieving areas, for example, and what is being done differently in the high-performance areas? Are there underlying cultural factors, such as local attitudes to education or socio-economic features, that influence educational outcomes, and if so, can we shape these factors using support measures? According to Rothon and Goodwin (2011), building social capital in deprived communities may be one way to improve educational outcomes. These authors believe that there should be more focus on the family as a provider of support for the student. Furthermore, McBride (2011, 7) suggests that in development work, the study of culture can help identify problems, the reasons why they exist, and solutions to them. In evaluation, the inclusion of culture is conducive to the full comprehension of what is evaluated. Today support measures in Finland are often directed to individuals, and we ask whether this is enough. Should there also be local or area support for the low performing regions in Finland and in a new way?

By connecting several assessments, we can better identify special regional characteristics. By studying local culture and people's interactions in it, we can also obtain significant local information. This knowledge in turn can be useful for local educators and administrators. In light of the results presented in this paper, we believe that it is crucial to identify special local characteristics before taking any major reconstructive action. At the same time, local or regional information can be useful for national education policymakers as well. In regard to nationwide educational policy, it is important to consider whether regional interventions are needed.

On the basis of these results, we suggest first that in studying educational outcomes, perhaps more attention should be paid to the regional and local characteristics. Second, connecting several assessments opens up broader perspectives on the different regional populations and their needs. Finally, people's interaction and the cultural knowledge of their regions can help to explain the results of larger assessments and guide possible reconstructive actions.

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ANTTI HILMOLA

6. REGIONAL AND GENDER VARIATION IN THE RESULTS OF LEARNING OUTCOMES IN CRAFTS ASSESSMENT

INTRODUCTION

The main purpose of this chapter is to re-analyze data from the national assessment of arts and crafts carried out by the Finnish National Board of Education during the spring of 2010. On an international level, this was the first assessment of all school-age children related to basic education in which the learning outcomes for arts and crafts subjects were evaluated on such a scale. In this context, the re-analysis is restricted to data on crafts. Its purpose is to answer the research question: how much national variation is there in the learning outcomes for crafts by comparison with theoretical subjects?

In this chapter, I first describe previous learning outcomes related to Finnish national assessments in basic education over the last few years. These descriptions are based on the reports for theoretical subjects, because these subjects have been the main targets of assessment. Thereafter, I will consider reasons for the differences perceived in the learning outcomes. It has been believed that the differences are connected to the pupils' family background, a question of the interaction between children and their parents. In effect, is school success hereditary? This chapter is thus linked to the theme of interaction by considering how educational outcomes are related to pupils' family background. I close by discussing the significance of national assessments when a school system is being developed. The curriculum reforms are based on information collected through national assessment projects. I hope that this chapter will furnish knowledge of the regional and gender variations in learning outcomes in Finland and will benefit the next curriculum reform.

REGIONAL AND GENDER DIFFERENCES IN PREVIOUS LEARNING OUTCOMES

Since 1998, teaching quality has been assessed by means of research and assessment projects. Generally speaking, girls have succeeded in national assessments of basic education better than boys. There are also differences between geographical areas in how pupils have placed in the brim quartiles (Jakku-Sihvonen 2009, 33).

In their article, Jakku-Sihvonen and Komulainen (2004) examine the assessment data collected over a four-year period, 1998–2002. The data are connected to the

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 91–101.

national assessments of mathematics, the pupils' mother tongue (Finnish), foreign languages, natural sciences, and religion. According to this study, the proportion of girls who performed well on these assessments was considerably larger than the proportion of boys. It was also noteworthy that the proportion of girls who performed poorly was distinctly smaller than the proportion of boys who performed poorly (Jakku-Sihvonen & Komulainen 2004, 275–76).

Jakku-Sihvonen and Komulainen (2004) continued their analysis of the assessment results based on the types of participating municipalities. Their analysis highlights the regional inequality found in education. The relative number of girls, who performed well, both in the metropolitan area and in northern Finland, was distinctly greater than the number of boys who performed well. Likewise, the relative number of boys who performed poorly in these areas was considerably greater than the number of girls who performed poorly (Jakku-Sihvonen & Komulainen 2004, 277).

Based on the success of the schools, the clear majority of schools that performed well were located in townships; a distinctly perceptible minority of schools that performed well was found in densely populated areas. Likewise, a majority of the schools that performed poorly were in rural areas, with a minority found in townships (Jakku-Sihvonen & Komulainen 2004, 278).

Kuusela (2006) has studied the same question and found that the learning outcomes were better in townships and weaker in rural areas. Furthermore, in schools in northern Finland, the learning outcomes were weaker than in other areas (Kuusela 2006, 6, 65). This phenomenon has been studied earlier. According to Pasanen (1996), a girl who attends school in a large town in southern Finland is more likely to succeed than a boy who goes to a small school in a rural locality in eastern or northern Finland (Pasanen 1996, 362).

Differences both between girls and boys and between geographical areas in learning outcomes have also attracted attention in connection with the PISA assessment tests. According to the PISA study of 2000, nearly 26 percent of Finnish girls and only 11 percent of Finnish boys scored at the top level of the ability to read. However, differences between pupils in township schools and those in schools in rural areas were not generally so great; nevertheless, the success of boys attending school in rural areas was distinctly below average for the country as a whole (Välijärvi et al. 2001, 13, 89–91).

According to a few recent national assessments of learning outcomes in Finnish basic education, girls succeeded in Finnish (their mother tongue) considerably better than boys, almost without exception (Lappalainen 2011, 33; Lappalainen 2008, 41). Boys outperformed girls only in physics (Kärnä et al. 2012, 90). Boys have been as successful as girls in mathematics, chemistry, history, and crafts (Hirvonen 2012, 46; Kärnä et al. 2012, 90; Ouakrim–Soivio & Kuusela 2012, 49; Hilmola 2011, 182). Generally, in southern Finland and in the townships, the results of learning outcomes have been better than in other areas of Finland. Based on the above-mentioned research, it could be hypothetically supposed that there is an apparent inequality between Finnish girls and Finnish boys in basic education.

According to the national assessment in arts and crafts, girls are better than boys in music and the visual arts. The regional differences were minor. The success in both subjects was a little better in the densely populated areas than elsewhere (Juntunen 2011, 71–72; Laitinen 2011, 126). The national assessment of crafts was at a satisfactory level. It must be remembered that in Finnish basic education, the subject of crafts includes two different tracks, technical work and textile work. When assessed according to craft materials, girls were better at textile work and boys were better at technical work (Hilmola 2011, 181–82). The assessment test contained tasks from both areas, which the pupils had to complete. It appears that crafts is one of the few subjects in which girls' and boys' success does not follow a dominant trend. At a general level, the results of crafts performance were equally good for girls and boys. However, boys in eastern Finland, the area of Oulu, as well as in rural areas succeeded better than girls (Hilmola 2011, 182, 190). It is therefore interesting to re-examine and re-analyze the national assessment data for the subject of crafts.

SOCIO-ECONOMIC BACKGROUND AS AN EXPLANATION FOR DIFFERENCES IN LEARNING OUTCOMES

According to Kalalahti (2012), a high level of parental education strongly supports the school success of children. Almost half (48%) of the children of highly-educated parents succeed well in school. Likewise, only a fifth (21%) of the children of parents with low levels of education attain the same level. In addition to the parents' education, the interaction between teacher and pupil supports pupils' school success. Girls with highly-educated parents succeed better in school than boys (Kalalahti 2012, 381). According to Välijärvi (2007), a school's status has no connection with the quality of teaching. It is mainly family background that affects children's success in school (Välijärvi 2007, 361–62).

The situation of girls' and boys' school success is not new as a research subject. More than fifty years ago, early studies showed that poor school performance in poor areas was connected to social and economic factors, which hampered the learning of pupils (e.g., Floud et al. 1956; Douglas 1964). It has been noted that learning outcomes in different schools will be strongly connected to differences in pupils' social backgrounds (e.g., Coleman 1966; Jencks 1972). According to Gordon and Monastiriotis (2006), the population structure in the location of a school can also be connected with the school's learning outcomes. The differences between schools are accentuated in urban areas (Gordon & Monastiriotis 2006, 213–36). A negative variation between locations and schools is found more often in the United States than in Europe (Jost 2007, 745–68; Reese 2005, 355).

Nearly twenty years ago, it was observed in European studies that the risk of marginal groups being sidelined in education had increased. The risk still exists and is emphasized by socio-economic background (Furlong & Cartmel 1997, 109–12). More recently, it has been observed in Sweden, Denmark, and Norway that the difference between the structure of a regional population and a school's

pupils is strongly connected to learning outcomes (e.g., Andersson 2004; Andersson & Subramanian 2006; Fekjaer & Birkelund 2007; Rangvid 2007; Andersson et al. 2010). Also in other Nordic countries the heritability of education has been explained by the following factors: the parents' knowledge, the parents' educational expectations, and the parents' cultural awareness (Andres et al. 2007, 154–57). The PISA studies, among other things, have shown that pupils' learning outcomes are connected with their family background. The connection is tied up with the cultural environment of the home and with the interaction between parents and children. (Linnakylä & Välijärvi 2005, 196–97). Moreover, according to Bernelius (2011, 491), the educational background of parents affects the pupils' results, irrespective of their starting points. These observations have been made elsewhere; Harju-Luukkainen & Vettenranta (2013) also suppose that the social environment in which people live and interact plays a role in students' educational outcomes.

According to Kalalahti (2012), the interaction, attitudes, and expectations of the family affect children's school success. Girls succeed in school better than boys. The support obtained from parents facilitates girls' school success. Furthermore, the support promotes girls' positive attitude towards school. The support of parents does not have an effect on boys' school success (Kalalahti 2012, 377–84). According to Lahelma (2004, 55–56), she suppose that girls will succeed well in school and that they will also like school.

DATA AND METHODS

The empirical information is based on data collected in the national assessment, which the Finnish National Board of Education (FNBE) carried out during the spring of 2010. The main purpose of the assessment was to evaluate the learning outcomes in crafts, the visual arts, and music in the ninth and final grade of basic education. The data were collected through a stratified sampling from 152 comprehensive schools (N = 4,792), which represented a wide cross-section of provinces and groups of municipalities. The subject-specific sample in crafts assessed 49 schools (n = 1,548).

Pupils from all 152 schools completed the test in the arts and crafts in which they were assigned ten tasks for each subject: ten in crafts, ten in the arts, and ten in music. In addition, the subject-specific sample assessed for crafts alone in 49 schools required the pupils to complete 24 tasks. This means that pupils participating in the crafts assessment completed a total of 34 tasks pertaining to crafts.

The types of assessment tasks included choice tasks, connecting tasks, and true or false tasks. The tasks contained pictures. On the basis of the pictures, the pupils had to determine which matters were related to crafts. The tasks were also connected to tools and materials, the planning and making of crafts products, the methods of making the crafts, sustainable development, working safely, and understanding the technology of crafts. Furthermore, a small sample of pupils (n = 661) participated in the production task in which an entire crafts process was carried out. The process was comprised of brainstorming, planning, making, and self-assessment in practice.

Below, the learning outcomes of the subject of crafts are examined by describing differences between both the geographical areas and the municipality types. School quartiles and pupil quartiles are used as a methodological solution. In the pupil quartiles, attention is given to differences between girls and boys. On the basis of earlier national assessments of basic education and the original results of the national crafts assessment, girls and boys have been defined here according to the following groups: Groups identified by geographical location consist of boys from eastern Finland, boys in the area of Oulu, boys in other areas, and girls in all areas. Groups of the municipality type include boys in rural areas, boys in other areas, and girls in all areas. Especially the differences between the Brim quartiles are compared. The study targets the crafts results of the boys in those groups where boys' success in other subjects has been weak. The statistical differences were tested with the analysis of variance (One-Way ANOVA). The Cohen's effect size index was also used as an analytical method.

RESULTS

In the results part of this chapter, I describe how the *schools* have been placed in quartiles based on the entire sample and then based on the crafts sample. Then I explain how the *pupils* have been placed in the quartiles based on the entire sample and according to the crafts sample. The main research results are given in Table 1, which shows how the schools and the pupils were placed in quartiles.

Examining the arts and crafts data using the entire sample showed that differences in the placement of schools in all quartiles, both by groups and by geographical locations, were statistically significant ($p = .030$) and also statistically significant by municipality type ($p = .001$). Compared to the expectation value, a large group (48%) of schools in eastern Finland placed in the upper quartile; there was also a small group (10%) of schools that placed in the lower quartile. Compared to the expectation value, southern Finland nevertheless had a large group of schools (35%) that placed in the lower quartile, and a small group of schools (17%) that placed in the upper quartile. The difference between schools in eastern Finland and those in southern Finland was statistically significant ($p = .025$). Despite the expectation value in rural areas, a large group of schools (47%) nevertheless placed in the upper quartile, and a small group of schools (13%) placed in the lower quartile. If students' learning outcomes were similar in all areas, then the results would be in line with national quartiles, which is the expectancy value (25%). The difference between the rural areas and the townships was extremely significant statistically ($p < .001$).

Based on the crafts sample, the data from the schools showed no statistically significant differences in the placing of schools in all the quartiles, whether by groups, geographical locations, or municipality types, because the number of schools ($n = 49$) in the sample was too small. This is why the differences between the school groups were estimated on the basis of Cohen's effect size index. If the Cohen's effect size index is .20 or less, the effect is small. If the index is .50, the

Table 1. How the schools and the pupils were placed in quartiles in this study.

		Schools in the Quartiles in the whole sample of Arts and Crafts				*Schools in the Quartiles in the Crafts sample*			
According to geographical location:									
		1	2	3	4	1	2	3	4
Southern Finland	(52/16)*	35%	19%	29%	17%	25%	38%	6%	31%
Western Finland	(56/18)*	25%	30%	24%	21%	28%	22%	39%	11%
Eastern Finland	(21/7)*	10%	13%	29%	48%	0%	28%	29%	43%
Area of Oulu	(15/5)*	13%	27%	27%	33%	20%	20%	40%	20%
Area of Lapland	(8/3)*	25%	50%	0%	25%	67%	0%	0%	33%
Between Groups: F = 2.77, df= 4, p = .030						Between Groups: F = 0.84, df = 4, p = .510			
According to municipality type:									
		1	2	3	4	1	2	3	4
Township	(80/25)*	34%	25%	26%	15%	32%	28%	20%	20%
Densely populated area	(25/9)*	20%	32%	32%	16%	22%	44%	23%	11%
Rural areas	(47/15)*	13%	21%	19%	47%	13%	13%	34%	40%
Between Groups: F = 7.74, df= 2, p = .001						Between Groups: F = 2.38, df = 4, p = .104			
		Pupils in the Quartiles in the whole sample of Arts and Crafts				*Pupils in the Quartiles in the Crafts sample*			
According to geographical location:									
		1	2	3	4	1	2	3	4
Boys in other areas	(1834/603)**	36%	22%	21%	21%	34%	21%	22%	23%
Girls in all areas	(2412/767)**	32%	26%	22%	20%	26%	28%	22%	24%
Boys from eastern Finland	(307/105)**	24%	23%	25%	28%	14%	28%	21%	37%
Boys from Oulu	(239/73)**	26%	22%	26%	26%	29%	16%	25%	30%
Between Groups: F = 9.07, df = 3, p < .001						Between Groups: F = 5.46, df = 3, p = .001			
According to municipality type:									
		1	2	3	4	1	2	3	4
Boys in other areas	(1716/554)**	37%	22%	21%	20%	34%	20%	21%	25%
Girls in all areas	(2412/767)**	32%	26%	22%	20%	26%	28%	22%	24%
Boys from rural areas	(664/227)**	25%	21%	25%	29%	23%	24%	24%	29%
Between Groups: F = 21.01, df = 2, p < .001						Between Groups: F = 3.09, df = 2, p = .046			

1 = Lower Quartile, 2 = Lower Middle Quartile, 3 = Higher Middle Quartile, 4 = Upper Quartile

* = The number of the schools (the whole sample/the Crafts sample)

** = The number of the pupils (the whole sample/the Crafts sample)

effect is moderate, and if the index is .80 or more, the effect is large. The indicative limit values should not be interpreted too literally (Metsämuuronen 2009, 1238). In eastern Finland, three schools out of seven placed in the upper quartile, and there were no schools placed in the lower quartile. In addition, only two schools (11%) placed in the upper quartile in western Finland. However, on the basis of Cohen's effect size index, the difference in the placing of schools in the quartiles between eastern and western Finland was large ($d = -.847$). In the rural areas, a large group of schools (40%) placed in the upper quartile and also a small group (13%) placed in the lower quartile. Similarly, a small group of schools in densely populated areas (11%) placed in the upper quartile. The difference placements of schools in the quartiles between rural areas and densely populated areas was moderate or close to large on the basis of Cohen's effect size index ($d = -.785$).

Turning now to the pupils' data, based on the whole arts and crafts sample, the differences in placement of pupils in all quartiles by geographical locations were extremely significant statistically ($p < .001$). It is striking that in the group of boys in other areas, only 21percent placed in the upper quartile, while 36 percent placed in the lower quartile. Thus, the difference between boys in other areas and boys in eastern Finland was extremely significant statistically ($p < .001$). It is also noteworthy that among the girls in all the areas, only 20 percent placed in the upper quartile, and 32 percent placed in the lower quartile. Thus, the difference between girls in all areas and boys in eastern Finland was extremely significant statistically ($p < .001$). In addition, the difference between boys from the Oulu area and boys in other areas was significant statistically ($p = .006$); the difference with regard to girls in all areas was significant statistically ($p = .013$). The pupils have been divided into quartiles almost in conformance with the expectation value in groups of boys from eastern Finland and boys from the Oulu area. However, in the group of boys from eastern Finland, there were a few more boys (28%) in the upper quartile than in other quartiles. The differences in the placing of pupils in all quartiles between groups by municipality types were extremely significant statistically ($p < .001$). A large group of pupils (29%) placed in the upper quartile in the group of the boys from rural areas. In the group of boys from other areas, 20 percent placed in the upper quartile and 37 percent placed in the lower quartile. Among the girls in all areas, 20 percent were placed in the upper quartile and 32 percent in the lower quartile. The differences between the group of boys in rural areas and all other groups were extremely significant statistically ($p < .001$) by municipality types.

An examination of the crafts sample of the pupils' data showed that differences in pupils' placement in all quartiles by geographical locations were significant statistically ($p = .001$). In the upper quartile, there were more pupils than in other quartiles among the boys from eastern Finland (37%). Compared to the expectation value, a large group of pupils placed in the lower quartile among the boys in other areas (34%). The difference between boys in eastern Finland and boys in other areas was statistically significant ($p = .001$). In addition, the difference between boys in eastern Finland and girls in all areas was statistically significant ($p = .014$). However,

it is noteworthy that the pupils are divided into the upper quartile nearly according to the expectation value for girls in all areas and boys in other areas. The differences in the placing of pupils in all quartiles by municipality types were also statistically significant ($p = .046$). The pupils have been divided into Brim quartiles nearly according to the expectation value for all groups. Compared to the expectation value in the upper quartile, there were more boys from rural areas (29%) than in other quartiles; in the lower quartile, there were more boys in other areas (34%) than in other quartiles. The differences between the boys in the countryside and the boys in other areas were statistically significant ($p = .039$).

The regional and gender variations, which are linked to the assessment results in crafts, are the reverse of one another, as in the earlier assessment results of theoretical subjects. In the schools in eastern Finland, in the area of Oulu, and in rural areas, boys were better than girls in crafts. This result is significant because boys from eastern Finland, northern Finland, and rural areas performed poorly in theoretical subjects over all. Girls performed better than boys in nearly all theoretical subjects. The differences are emphasized in the townships of southern Finland (e.g., Jakku-Sihvonen & Komulainen 2004; Kuusela 2006).

DISCUSSION

The theoretical starting points for this chapter show a negative systematic variation in the learning outcomes of theoretical subjects in Finland. The regional variation is repeated in all the national assessments. The regional variation is also an international phenomenon and has been explained as being caused by the pupils' family background, a question of the interaction between children and parents. According to earlier studies, the interaction within families is connected with the socio-economic background of the parents. It may be that in the areas of eastern Finland, northern Finland, and rural areas there are more families with low socio-economic backgrounds than in other areas. This is especially reflected in boys' learning outcomes (cf. Jakku-Sihvonen & Komulainen 2004; Kuusela 2006).

As for the research question posed in this chapter, differences in learning outcomes for crafts can be perceived as being similar to those for other subjects, yet from a regional viewpoint, the results are the opposite of those for theoretical subjects. With regard to the quartile analysis, more schools have succeeded well in crafts in eastern Finland and in rural areas than in southern and western Finland or in townships and densely populated areas. The difference is clear enough to support the claim that boys in eastern Finland, the area of Oulu, and in rural areas succeeded in crafts better than pupils elsewhere in Finland. The central observation of this chapter is that schools and pupils succeed in crafts in areas where educational learning outcomes are otherwise weak. The difference is systematic and is especially clear in the differences between the brim quartiles. The occurrence of such regional differences goes against the grain of national education policy (cf. Jakku-Sihvonen & Komulainen 2004; Kuusela 2006).

It appears that, until now, Finnish pupils' learning outcomes have been too narrowly evaluated, by theoretical subjects only. It also appears that in the families with lower socio-economic backgrounds, manual skills and learning by doing is appreciated. The children are encouraged to do well in these areas, a finding that applies especially to boys. Similarly, in families with a higher socio-economic background, academic skills are appreciated. The current assessment culture has given too one-sided a view of the knowledge and skills of pupils because only theoretical subjects have been evaluated. One must remember that know-how which is based on knowledge and know-how based on skill exist separately. Among pupils, there are different kinds of learners, and in pupils' homes, there are different cultures of familial interaction (cf. Jakku-Sihvonen & Komulainen 2004; Kuusela 2006; Kalalahti 2012).

There needs to be a balance between theoretical and practical subjects in the curriculum, a balance that makes different kinds of learning possible and that evens out differences in learning outcomes. After such a curriculum reform, the different know-how would be emphasized only in the different socio-economic groups. Could this kind of result be a starting point for making changes in the curricula of the future? Could subjects like crafts, which are based on problem-solving in practice, be added to the curricula in Finland, as they are abroad? In Finland today, the trend, however, appears to be different.

According to the time allocated for lessons in basic education (Finnish Government 2012), the number of classroom hours devoted to crafts will decrease in the upper grades beginning in 2016. The change is questionable from the viewpoint of educational policy and, in my view, poses a high risk. Research has shown that most Finnish pupils appear to succeed in theoretical subjects, while a minority succeeds in practical subjects. Yet lessons in which the minority now succeeds are in the process of being taken away from pupils who learn in a practical manner. Why are learning outcomes evaluated if the results are not widely used to advantage in making curriculum reforms? The Ministry of Education and Culture and the Finnish National Board of Education should react to this policy change and begin a new interaction in the field of educational policy.

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7. HOW ARE SITUATIONAL ACADEMIC EMOTIONS RELATED TO TEACHER STUDENTS' GENERAL LEARNING PROFILES?

INTRODUCTION

When students enter lecture halls and seminars, they enter with various dispositions and may entertain a range of beliefs. Such beliefs may also be socially shared by their discipline or academic community (Lonka & Lindblom-Ylänne 1996; Mäkinen, Olkinuora, & Lonka 2004). These dispositions may contribute to engaging or disengaging interaction with the academic environment in question. Contexts may vary in terms of how engaging and student-activating they are (Lonka & Ketonen 2012). The interaction between the student and the learning environment can lead to either *constructive* or *destructive friction*, depending on how students' individual study habits correspond to the demands of the learning environment (Vermunt & Verloop 1999). The learning environment and the instruction trigger either positive or negative situational emotions. Research on emotions has shown that students experience a rich variety of emotions in academic settings (Pekrun, Goetz, Titz, & Perry 2002).

The purpose of this chapter is to discuss the role of academic emotions in the process of studying and learning. We wanted to investigate how university students who varied in terms of their study profiles experience an interactive lecture, and specifically, what kinds of academic emotions they express. Our focus is on the relation between students' dispositions and their experience of a specific form of interaction, namely, an activating mass lecture.

Below, after the introduction, current theories and research on student learning, motivation, and academic emotions, as well as the aims of this study are presented. Then the methods and results of the empirical investigation are given. Finally, some proposals for future studies are discussed.

LEARNING RESEARCH TRADITIONS IN HIGHER EDUCATION

There is a long history of research on student learning in higher education (Lonka, Olkinuora, & Mäkinen 2004). In previous research, a number of frameworks have been applied to the question of university study. Student Approaches to Learning (SAL) is probably the best-known. It differentiates between surface and deep

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approaches and introduces as well a strategic approach (e.g., Biggs 1987; Entwistle & Ramsden 1983; Lonka & Lindblom-Ylänne 1996; Marton & Säljö 1976).

The other main tradition is Self-Regulated Learning (SRL) (e.g., Boekaerts 1997; Pintrich 2000; Vermunt 1998). Students may be able to regulate their own learning or rely on external regulation (e.g., by the teacher). Vermunt (1998) pointed out that in the most problematic cases, students lacked the readiness to regulate their own learning. Lonka & Lindblom-Ylänne (1996) showed that such regulatory problems were harmful, even among highly selected students in medicine and psychology.

A somewhat different tradition relies on Cognitive and Attributional Strategies (e.g., Cantor 1990; Eronen, Nurmi, & Salmela-Aro 1998; Jones & Berglas 1978; Martin, Marsh, & Debus 2001; Norem 1989; Nurmi, Aunola, Salmela-Aro, & Lindroos 2003). Some students will deliberately avoid challenging goals rather than make an effort to deal with the challenges. Such thinking strategies have been described in terms of task avoidance. On the other hand, some students use active, task-focused strategies, such as optimism, when faced with challenging goals. While task avoidance predicts low academic achievement and dissatisfaction, optimism predicts positive achievement and satisfaction (Nurmi et al. 2003).

Heikkilä and Lonka (2006) were the first to look at the relations among the three traditions and show that the surface approach to learning, a lack of regulation, and task avoidance were mutually related, and that deep approach, self-regulation, and optimism were also related to each other. Such dispositions are related not only to learning outcomes, but also to the general well-being of university students (Heikkilä, Lonka, Nieminen, & Niemivirta 2012): optimistic and self-regulated students did better than those who suffered regulatory problems and task avoidance.

Even in highly selected student populations, there are problematic approaches to studying. Universities may pose the danger of distress for the students (Robotham & Julian 2006). Students may feel stressed, anxious, or exhausted when the demands and study pace are felt to be too high (Lonka et al. 2008). In addition, lack of interest has to do with an individual's experience of how meaningful and important they consider their studies to be. Mäkinen et al. (2004) showed that lack of interest especially (i.e., cynicism and lack of meaning) was a significant risk for drop-outs in all faculties. *Dysfunctional orientation* was identified by Lonka et al. (2008), in which exhaustion, lack of regulation, lack of interest, and task avoidance were all related.

Linking approaches to learning, self-regulated learning, and cognitive and attributional strategies has been shown to be a fruitful way of examining teacher students' learning (Heikkilä et al. 2012). Research, however, indicates that *academic emotions* are significantly related to student motivation, learning strategies, cognitive processes, self-regulation, and academic achievement. Pekrun et al. (2002) defined academic emotion as an emotion experienced in academic settings and related to studying, learning, or instruction. Such emotions, for example, are the enjoyment of learning, pride in success, or test-related anxiety. In addition to the general profiles, we wanted to investigate the role of academic emotions in the study and learning

processes. Our previous research showed that situational academic emotions were related to learning outcomes in a student-activating lecture course (Ketonen & Lonka 2012; Lonka & Ketonen 2012). Interest and exhaustion were positively related, whereas anxiety was negatively related to the grade for the course.

The question remains: what is the interaction between general learning profiles and situational academic emotions? These subjects have been investigated separately, but to our knowledge not much is known about the relationships between general and situational aspects of studying and learning among university students. The only exception is Trigwell, Ellis, & Han's (2012) study in which a relationship was found between the ways first-year university students experienced their courses emotionally and the approach they took to learning. The students who experienced more positive emotions and fewer negative emotions were likely to adopt a deeper approach to learning. By contrast, students who described more of a surface approach to learning were more likely to report fewer positive emotions and more negative emotions (Trigwell et al. 2012).

We wanted to explore the relationships between general learning profiles and situational academic emotions in a student-activating lecture course. We examined the kinds of learning profiles that could be found to classify the participants according to the general levels of exhaustion, problems in regulation of learning, lack of interest, task avoidance, and optimism expressed, and we studied how these profiles differed in terms of situational academic emotions, the degree of challenge experienced in a task, a sense of competence, self-study time, and learning outcomes. We hypothesized that general learning profiles would predict the kinds of situational emotions that would be triggered in a lecture context.

DATA AND METHODS

Participants

The participants were 107 Finnish first-year elementary and kindergarten teacher students from the University of Helsinki. In Finland, the teaching profession is very popular, and many apply to study. Only about seven percent of applicants are accepted to the five-year Master of Education program for elementary school teachers. Even though it is somewhat easier to get into the three-year kindergarten teacher education program (a Bachelor of Education degree), it is reasonable to argue that the students who participated in the present study formed a highly select group.

In their first semester, the participants attended a student-activating introductory course in educational psychology (the context is described in more detail in Lonka & Ketonen 2012). Overall, 77% of those who attended filled in the questionnaire used in our study. The participants' ages ranged from 19 to 51 (mean 23.6, standard deviation 5.4). Women (85%) were overrepresented compared to men (15%), a difference that reflects the gender distribution in teacher education at the University of Helsinki.

Procedures

The data were collected in December of 2009. The purpose of the study was explained to all participants. It was emphasized that participation was voluntary and that, at any time, the participants could decide not to complete the questionnaire. All participants signed an informed consent form, including consent to collect the course grades as part of the data. The participants filled in the questionnaire during the last lecture of the course, five days before the course examination. Of the 107 participants, 92 filled in the questionnaire and took the course examination. In the statistical analyses, the largest possible number of participants was included in each analysis.

Materials

The self-reported questionnaire consisted of Likert-type questions to assess general factors in studying, such as emotional and motivational problems, along with cognitive and attributional strategies, as well as situational factors, including academic emotions, the challenge experienced, and the students' sense of competence. The last three, unlike the general factors, were each measured situationally in the context of the course.

General learning profiles were assessed using items based on the MED NORD instrument (Lonka et al. 2008), which is a collection of scales measuring a variety of aspects of student learning. The structural validity of the scales was tested by means of a series of factor analyses.

Three separate scales were used for assessing students' emotional and motivational study problems. For assessing exhaustion in relation to studying, a modified four-item version of the Maslach and Jackson (1981) Exhaustion Scale was adopted (e.g., ''I feel totally exhausted''). Students' experienced lack of interest (e.g., "The contents of my studies do not motivate me'') was assessed with two items from the Inventory of General Study Orientations (IGSO) (Mäkinen et al. 2004). Items concerning problems with regulation of learning were adopted from the Inventory of Learning Styles (Vermunt & Van Rijswijk 1988). Three items from the original five-item Lack of Regulation scale were used (e.g., ''I notice that I have trouble processing a large amount of subject matter''). A Likert scale ranging from (1) totally disagree to (5) totally agree was used to rate each item.

A shortened version of the Strategy and Attribution Questionnaire (SAQ) (Nurmi, Salmela-Aro, & Haavisto 1995) was used to assess students' cognitive and attributional strategies. We used eight items from the inventory to reflect two types of strategies: optimism (e.g., "When I get ready to start a task, I am usually certain that I will succeed in it") and task avoidance (e.g., "What often occurs is that I find something else to do when I have a difficult task in front of me"). The Likert scale ranged from (1) totally disagree to (5) totally agree.

Based on the MED NORD instrument (Lonka et al. 2008), we constructed sum variables for each scale: (1) exhaustion, (2) lack of interest, (3) lack of self-regulation,

(4) optimism, and (5) task avoidance. Cronbach's alphas for each variable were .78, .76, .70, .77, .72, respectively.

Academic emotions were assessed using a modified PANAS scale (Watson, Clark, & Tellegen 1988; see also Litmanen, Lonka, Inkinen, Lipponen, & Hakkarainen 2012; Tolvanen et al. 2011), consisting of four positive affects (interest, enthusiasm, determination, energy) and four negative affects (exhaustion, anxiety, nervousness, irritation). The questionnaire also addressed two single-item measures relating to the challenge of the task ("How challenging is this course?") and a sense of competence ("How competent do you feel in this course?"). All items were answered using a Likert scale ranging from (1) not at all to (7) very much.

Stress was measured with a single-item measure of stress symptoms (Elo, Leppänen, & Jahkola 2003). This measure first gives a definition of stress followed by a question and a rating scale: "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?"The response was reported on a 5-point scale, varying from 1 (not at all) to 5 (very much). In addition, the participants were asked to evaluate how many hours they had spent on self-study by the time they filled in the questionnaire.

Learning outcomes were measured by using the grades obtained from the course from which the data were collected. The course exam was arranged five days after the last lecture and called for understanding and applying knowledge; thus, learning details by heart was not rewarded. The final grade was given on the European Credit Transfer and Accumulation System (ECTS) scale of 1 (no understanding) to 5 (deep understanding).

RESULTS

Correlations

Our first question concerned the relationships between emotional and motivational study problems and cognitive and attributional strategies (variables measuring general learning profiles). In order to explore these relations, bivariate correlations were computed (Table 1). Lack of regulation correlated positively with all the other study problems: exhaustion, lack of interest, and task avoidance, and negatively with optimism. In addition, there was a positive correlation between lack of interest and task avoidance.

General Learning Profiles

In order to examine the kinds of learning profiles that could be found, we used a cluster analysis to classify the participants according to their responses to exhaustion, lack of regulation, lack of interest, task avoidance, and optimism. A hierarchical cluster analysis, selecting the squared Euclidean distance as a similarity measure,

Table 1. Pearson product-moment correlations between exhaustion, lack of regulation, lack of interest, task avoidance, and optimism.

	1	*2*	*3*	*4*
1 Exhaustion				
2 Lack of regulation	.514**			
3 Lack of interest	.209*	.319**		
4 Task avoidance	.152	.452**	.322**	
5 Optimism	−.219*	−.301**	−.180	−.054

**p < .05, ** p < .01*

Table 2. Means, standard deviations, and ANOVA results for profile differences on exhaustion, lack of regulation, lack of interest, task avoidance, and optimism.

	Dysfunctional n = 34		*Committed n = 30*		*Unstressed n = 39*				
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F(2,100)*	*p*	η_p^2
Exhaustion	3.41_a	.61	3.20_a	.58	2.08	.55	21.04	.000	.53
Lack of regulation	3.93	.57	3.19	.68	2.53	.67	38.35	.000	.47
Lack of interest*	2.78	.88	1.32	.44	1.94	.73	19.21	.000	.40
Task avoidance	3.07	.57	2.16_a	.62	2.50_a	.56	48.10	.000	.29
Optimism	3.05	.61	3.43_a	.70	3.58_a	.51	22.48	.001	.13

*Note. Means within a row sharing the same subscripts are not significantly different at the p < .05 level. Owing to unequal variances, the Games-Howell correction instead of Bonferroni was applied to the variables with an *.*

was carried out in order to determine the number of clusters. Ward's method was used to form the initial clusters without restricting their number. On the basis of the dendrogram, a three-cluster solution was selected. After deciding on the number of clusters, we used a Quick Cluster Analysis with a K-means algorithm to form the final clusters.

The students were distributed among three profiles in the following manner: 33% of the students were in the first profile (n = 34), 29% in the second (n = 30), and 38% in the third (n = 39). The profiles differed statistically significantly on all clustering variables, with effect sizes (η_p^2) ranging from .13 to .53 (see Table 2). Pairwise comparisons, however, suggested variation in the patterns of differences across the profiles. All profiles differed significantly from each other in lack of regulation and lack of interest, while pairwise differences were detected in all the other variables. The three profiles were labelled according to the score means as (1) *dysfunctional*, (2) *committed*, and (3) *unstressed students*.

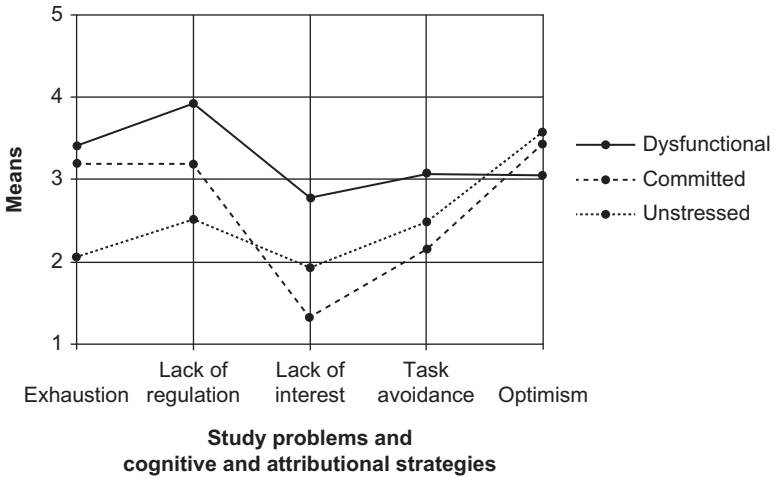

Figure 1. General learning profiles (mean scores of the groups).

Dysfunctional students made the highest scores on all the study problems and the lowest scores on optimism. *Committed students* scored lowest on lack of interest and task avoidance and average on optimism. Nevertheless, *committed students* expressed some exhaustion and lack of regulation. *Unstressed students* scored second highest on lack of interest and task avoidance, but still had the highest score on optimism and the lowest scores on exhaustion and lack of regulation. Figure 1, which shows the mean score profiles, illustrates the relative differences among the three learning profiles.

The Relation of General Learning Profiles to Situational Factors and Learning Outcomes

Finally, two MANOVAs were conducted to examine between-group differences across the criterion variables of academic emotions, stress, the challenge experienced, sense of competence, self-study time, and learning outcomes (see Table 3 for a summary of the results). First, we examined group differences in relation to situational academic emotions and stress. The main effects were significant for all variables, with effect sizes ranging from .08 to .25. Pairwise comparisons revealed that *dysfunctional students* displayed lower levels of all the positive emotions than either the *committed* or the *unstressed students*, who, in turn, did not differ from each other on positive academic emotions. Similarly, *dysfunctional students* reported exhaustion and irritation significantly more than the other two groups. By contrast, *unstressed students* reported the lowest levels of anxiety, nervousness, and stress, lower than either *dysfunctional* or *committed students*, which interestingly did not differ from each other in terms of these emotions.

Table 3. Means, standard deviations, and MANOVA results on academic emotions, stress, experienced challenge, and sense of competence.

	Dysfunctional n=34		*Committed n=30*		*Unstressed n=39*				
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F(2,97)*	*p*	η_p^2
Interest	4.85_a	1.30	5.68_b	1.09	5.33_{ab}	1.11	3.98	.022	.08
Enthusiasm	4.00	1.15	4.89_a	1.26	4.74_a	1.27	4.89	.009	.09
Determination	3.58	1.06	4.61_a	.96	4.41_a	1.25	7.76	.001	.14
Energy	2.79	1.02	3.96_a	1.20	3.85_a	1.20	10.40	.000	.18
Exhaustion	4.55	1.39	3.68_a	1.12	3.05_a	1.49	10.76	.000	.18
Anxiety	4.64_a	1.67	4.00_a	1.85	2.56	1.29	16.12	.000	.25
Nervousness	4.33_a	1.58	3.89_a	1.50	2.85	1.41	9.52	.000	.16
Irritation	3.55	1.62	2.39_a	1.20	2.28_a	1.23	7.27	.001	.13
Stress	3.70_a	.98	3.50_a	.88	2.62	1.09	11.96	.000	.20
Challenge	5.39_a	.86	5.29_a	1.05	4.85_a	1.07	3.05	.052	.06
Competence*	3.15	.91	3.96_a	.88	4.36_a	1.23	12.14	.000	.20

*Note. Means within a row sharing the same subscripts are not significantly different at the $p < .05$ level. Owing to unequal variances, the Games-Howell correction instead of Bonferroni was applied to the variables with an *.*

Next, we investigated whether there were differences between the groups in the situational sense of competence or the challenge experienced. The main effect was significant for a sense of competence, but not for the challenge experienced. As expected, both *committed students* and *unstressed students* scored higher on the sense of competence than *dysfunctional students*, but the two groups did not differ from each other. All three student groups experienced the course as highly challenging; *dysfunctional students* had the highest scores and *unstressed students* the lowest, but none of the pairwise differences showed statistical significance.

Our last aim was to examine whether there were differences between the profiles in self-study time or learning outcomes. The participants were asked to evaluate how many hours they had spent in self-study by the time they filled in the questionnaire. The main effect was significant for self-study time, $F(2, 84) = 8.58$, $p = .000$, $\eta_p^2 = .17$. Pairwise comparison with Bonferroni´s correction revealed that *committed students* had spent more hours in self-study (M = 20.12, SD = 15.09) than either the *dysfunctional students* (M = 10.23, SD = 8.49) or the *unstressed students* (M = 9.55, SD = 7.58). The latter two groups did not differ from each other in terms of self-study time. Learning outcomes were assessed by means of the grade on the final examination in the course. Interestingly, the main effect was not significant for the course grade: $F(2, 84) = 2.09$, $p = 0.130$, $\eta_p^2 = .05$. Regarding

learning outcomes, *committed students* had the highest scores (M = 3.77, SD = .65) compared to *unstressed students* (M = 3.64, SD = .78) or *dysfunctional students* (M = 3.36, SD = .83), but none of the pairwise differences achieved statistical significance based on pairwise comparison using Bonferroni's correction.

DISCUSSION

Our research showed that general study profiles were related to situational academic emotions, a sense of competence, and self-study time, but there appeared to be no direct association between general profiles and academic achievement in the specific course we examined. Unlike our results, a study by Heikkilä et al. (2012) showed that teacher students' general cognitive-motivational profiles were related to course grades. In our research, student profiles were based on emotional and motivational factors instead of on cognitive approaches, such as *deep understanding*, *critical evaluation*, and *surface approach* (Heikkilä et al. 2012), which could explain the missing interrelation. The general learning profiles found in our study would likely be related to students' grade point average (GPA) and accumulation of credits, which measure long-term performance instead of success in a specific course. In our previous research, however, situational academic emotions measured during this same student-activating lecture course were related to learning outcomes (Ketonen & Lonka 2012; Lonka & Ketonen 2012). Thus, the relationship between general learning profiles and learning outcomes may be mediated by situational academic emotions. This hypothesis will be tested in future research by path analysis using a larger sample size.

Since the first-year students were involved and the course content was demanding, it was not surprising that the experienced level of challenge was generally high. A strong sense of competence, however, was reported by *committed* and *unstressed students*, who also expressed positive academic emotions more often than the *dysfunctional students.* The weakest sense of competence was reported by the *dysfunctional students*, who also expressed the least positive emotions and more exhaustion and irritation. This supports the idea of constructive and destructive friction (Vermunt & Verloop 1999), whereby different groups of students reacted in various ways.

Interestingly, *committed students* also experienced some negative emotions: while *unstressed students* expressed the least anxiety, nervousness, and stress, *dysfunctional* and *committed students* did not differ from each other in terms of these emotions. It is possible that *committed students* experienced a constructive friction, forcing them to struggle somewhat at the upper limits of their competence. Such experience may eventually lead to a flow experience (Csíkszentmihályi 1990). Further, it seems that engaged and committed students may also feel concern about their performance, which is revealed, for example, in stress and nervousness, while unstressed or carefree students seem to be lacking in all negative emotions. One reason for rather high positive emotions and rather low anxiety, nervousness, and

stress could be that *unstressed students* had more knowledge of the course content to begin with. The highest competence and lowest challenge reported by *unstressed students* also speaks for this hypothesis. However, regardless of an otherwise rather good profile, *unstressed students* expressed a lack of interest more than *committed students*, an emotion that can be detrimental to motivation and even a reason for dropping out (Mäkinen et al. 2004). Thus, it would be interesting to follow these students to see which group succeeds best in the long run.

One limitation of the present research was that general study profiles and situational emotions were measured at the same point in time. In our later data collections, we corrected this and used a design that allowed us to measure general profiles before the course began. We also increased the number of participants by investigating students from other faculties and disciplines in addition to those in teacher education. In the future, we plan to report results from more and less student-activating courses and from students in different faculties in order to see how generalizable our results may be.

In the future, we will also look at the *expectancy value* (Eccles et al. 1983; Eccles 2005) before and after the lecture courses. It would be interesting to see how the expected value of the task, the general study profiles, and the situational emotions interact. It is important to look at what makes students invest their time in self-study and what factors predict university success. Such studies will provide valuable information about how to make mass lectures more engaging and productive learning experiences.

General study orientations seem to reflect a disposition that predicts the kinds of emotions that will be triggered during a course. That some students (even from a highly selective group) were not quite functional calls for further reflection: how can we better support their learning and study? Previous research indicates that well-being during the study years predicts future well-being at work (Salmela-Aro, Tolvanen, & Nurmi 2009). We want to promote meaningful learning and positive emotions in higher education, since we believe that these are the keys to our students' well-being and future success in life.

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8. CULTURAL ASPECTS IN UNDERSTANDING THE VISUAL ARTS

Pedagogical Perspectives in (Multi)cultural Interaction

INTRODUCTION

The purpose of this chapter is to examine how multicultural students interpret classical Finnish paintings of Finland's golden age. The chapter focuses on classroom interaction in the visual arts. Visual culture seems to be taking an increasingly large role in every pupil's life. Even in early childhood, pupils are surrounded by masses of different images and visual types of communication. In addition, today's schools, with their various digital learning environments, emphasize skills in reading visual information. Thus, understanding the meaning of visual literacy is a pedagogically valuable challenge for today's teachers, especially in the context of visual arts as part of basic education. In this chapter, the term visual arts refers to art forms that are primarily visual in nature, such as painting, sculpture, and photography.

In Finland, the number of pupils with multicultural backgrounds is increasing, especially in the southern parts of the country. This development means that the cultural heritage that pupils bring to the classroom is becoming more heterogeneous in basic education settings. From this perspective, the process of understanding the visual arts as a means of constructing cultural identity needs to be reconsidered pedagogically. For example, it is a great responsibility to guide pupils' understanding of so-called "national masterpieces." In Finland's current National Core Curriculum for basic education, every pupil is expected to study masterpieces from the Finnish golden age, a time when many artists were involved in the political movement beginning in the late nineteenth century to construct a distinct cultural identity for the Finns. How should teachers support the construction of pupils' cultural identities in a pedagogically astute way vis-à-vis these works of art, taking into account all the diversity in today's classrooms?

The golden age paintings represent an ideal of Finnish cultural identity by virtue of their connection to the national epic, the *Kalevala*, and the aspiration to find a core of true "Finnishness" (see e.g., Valkonen 2004). The works were manifestations of a movement that gained momentum at the end of the nineteenth century, which was intended to unify Finns from diverse linguistic and cultural backgrounds by constructing a uniform cultural identity. It was a time when Finland was an autonomous Grand Duchy of the Russian Empire, during which a spirit of nationalism developed in the country. In the visual arts, Finland's artists endeavoured to create

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a visual cultural identity that was unique to Finns. They sought to replace Finns' feelings of inferiority and idealization of other peoples, such as the ancient Greeks, with original and genuine Finnish prowess, as found in the stories and characters in the *Kalevala* and in landscapes that were given national meaning, especially Karelia, where the *Kalevala* verses had been collected. In Finnish paintings, the stigmas that came with being Finnish, such as poverty and barren circumstances, were transformed into assets.

At the same time, these works of art have been widely interpreted as if the national cultural identity was a continuous or uniform phenomenon, which was not the case (see Kairavuori 2012, 141; Lehtonen 2009; Hall 2002). Nevertheless, these paintings represent the kind of "cultural inheritance" to which the national curriculum refers. We were interested in the meanings that pupils from diverse backgrounds (the new Finnish generation) give these visual messages.

The golden age paintings are seen as part of Finnish cultural identity. Karjalainen (2009), for example, views these images as being very important and personally significant to Finns. The pictures may generate strong feelings, even in the contemporary world with its abundance of visual data. W. J. Mitchell divides images into categories of saintly pictures, which are worshipped, personal fetish-like images, and communal totem images, which are symbols of unity, for example, of a family, a tribe, or a nation. The golden age paintings could be seen as totem images for Finns. The paintings are still meaningful today, despite the radical changes over time, in values, and in historical circumstances. They are a part of our national family photo album. (Karjalainen 2009, 13–22)

In this chapter we examine the golden age paintings in the context of cultural codes. The paintings are seen as an essential part of the Finnish cultural heritage and cultural identity. We are interested in finding out how pupils of today unlock these visual cultural messages, a question we also discuss in the context of the national educational curriculum. From this point of departure, we are interested in what pupils attending multicultural schools see in the "Finnish national masterpieces," the paintings of the Finnish golden age. The imagery in today's media is already relatively international. Nevertheless, the visual arts may still have a strong cultural and ethnic background, which may require special contextual codes for interpretation. We also discuss what teachers should take into consideration when implementing their curriculum aims for the visual arts in a multicultural classroom. Our purpose is to identify the main things the teacher of a multicultural class needs to take into consideration when teaching the golden age paintings. We will also discuss the current challenges to pedagogy for developing the visual literacy needed to support the cultural identity of every pupil, regardless of background.

DEVELOPING VISUAL LITERACY

Our contemporary world is very visual. Pictures contain an abundance of information and involve interactions and are part of communication. Interpretation

of this information always has a cultural context. A visual text, just like a written one, is structured according to a certain code. We need to know the codes or learn those which regulate meanings in order to communicate and interact effectively. Strong visual literacy is needed to clarify the cultural meanings in pictures. (See e.g., Seppänen 2001; Kupiainen 2007).

Visual literacy has been given several slightly different definitions. If we consider that the term *literacy* means the ability to read and write words, then we could say that visual literacy refers to the ability to read and create images. For example, Wileman (1993, 114) sees visual literacy "as the ability to read, interpret, and understand information presented in pictorial or graphic images." Heinich, Molenda, Russell, and Smaldino (1999, 64) define visual literacy as "the *learned* ability to interpret visual messages accurately and to create such messages."

Communication and interaction are at the core of many definitions. For example, Sinatra (1986) sees visual literacy as communication by representation. Sinatra's (1986, 5) definition for visual literacy is "the active reconstruction of past visual experience with incoming visual messages to obtain meaning." He emphasises the action taken by the learner to create recognition. Furthermore, Stokes (2001) defines visual literacy as the ability to interpret images and generate images for communicating. Seppänen (2001) in turn defines visual literacy as the critical understanding of the meanings of visual orders. He also adds that understanding these culture-bound presentations is not self-evident. Giorgis et al. (1999, 146) define visual literacy as the ability to construct meanings from visual images. Stafford too (2011, 1) sees visual literacy as an active process of reading, interpreting, and understanding images and visual media.

The use and interpretation of images is a specific language in the sense that images are used for communicating messages, which must be decoded in order to have meaning (Branton 1999; Emery & Flood 1998). If visual literacy is seen as a language, then there is a need to know how to communicate using this language. That includes being alert to visual messages and critically reading or viewing images as the language of the messages.

The concept of visual literacy in itself suggests that it is a skill that can be learned. (See, e.g., Heinich et al. 1999). Stokes (2001) states that most visualization skills can be developed with practice. (See also Flattley 1998; Chanlin 1999).

Several approaches have been suggested for developing visual literacy skills (Heinich et al. 1999). One is to help learners read or decode visual images through practicing analytical techniques. Decoding involves interpreting and creating meaning from visual objects. Another approach is to help learners write or encode visual images as a tool for communication. Students develop their visual abilities through practice.

Stokes (2001) points out that visual literacy, like language literacy, is culture-specific, although there are universal symbols or visual images that are understood globally. A culture's predominant mode of literacy depends on the technology and mass media it embraces (Sinatra 1986). Different cultures and languages, as well as

different ways of using languages, construct different realities (e.g., Eisner 1982, Efland 2002).

CONSTRUCTING CULTURAL IDENTITY IN BASIC EDUCATION

The Finnish National Core Curriculum for basic education (2004) specifies the objectives and core contents of cross-curricular themes, subjects, and subject groups in basic education and is intended for pupils receiving compulsory education. "Cultural identity and internationalism" is given as one of the cross-curricular themes. The main purpose of this theme is to help pupil understand the essence of Finnish and European cultural identities, to discover his/her own cultural identity, and to develop capabilities for cross-cultural interaction and internationalism. The objectives of this cross-curricular theme are that pupils will be able to do the following:

> Know and appreciate their respective cultural inheritances, spiritual and material, and to see Finnish cultural identity as an element of indigenous, Nordic, and European cultures;
>
> Understand the roots and diversity of their own cultures and see their own generation as a continuation and development of previous generations' ways of life;
>
> Receive an introduction to other cultures and philosophies of life and acquire the ability to function in a multicultural community and in international cooperation;
>
> Understand the component factors of cultural identity and their meanings for the individual community (quoted from the Finnish National Core Curriculum for Basic Education 2004, 37).

According to Mikkola (2001, 78), immigrant children in Finland see themselves both as representatives of their own ethnic cultures and as their new homeland. These immigrants believe that it is important to strengthen both the cultures and the bonds to these cultures. A strong and clear self-image, self-appreciation, and awareness of one's own cultural identity help pupils adapt to a new culture and therefore to cope with life in general.

Räsänen (2008, 254; 2012, 1–2) describes the factors that affect cultural identity as micro-cultures; these include age, language, religion, gender, ethnicity, geographical background, social background, skills, and nationality. She considers religion and locality as the dominant micro-cultures, with the individual considered a member of several reference groups. A person's cultural identity changes throughout one's life and can be defined completely differently by oneself as opposed to a definition by an outsider. In contemporary society, it is not possible to be part of only one culture. Today scholars consider cultural identity to be hybrid and constantly changing. Cultural identity is not based on opposites; rather it is "thoroughly diverse" (e.g., Seppä 2012, 174).

Räsänen (2008, 2012) sees multicultural visual arts education as intercultural communication. The experiential learning process of art involves working through one's own experiences and putting new knowledge into practice. This can affect the whole personality and increases cognitive skills, self-expression, and the ability to interpret and evaluate art both ethically and aesthetically. The goals of experiential visual arts education emphasize the self and identity building. Art helps us study ourselves and our relation to the world. Art education helps us to observe differences in human cultures and promotes an ethical attitude towards the unfamiliar. Our cultural identity is based on literal, visual, and other kinds of narratives and representations that have arisen at certain times and in certain places. In order to understand other individuals and cultures, we must have the skills to interpret the art they make. Ways of making and experiencing art are always linked to broad cultural contexts. The artist's and the viewer's identities consist of personal and social dimensions that cannot be separated. Art education involves identity construction, whereby students build bridges between these aspects. (Räsänen 2008, 105, 206; 2012, 3; Kolb 1984). According to Pääjoki (2004), art can be seen as the place for cultural encounters.

DATA AND METHODS

In the Finnish school system, in grades 1–6 the generalist educator, the class teacher, usually teaches the visual arts. We have collected data in the metropolitan area of Finland (namely, the Helsinki region) from two fifth-grade classes (N = 57) at one primary school, where approximately half of the pupils have an immigrant background (e.g., they come from Somalia, Congo, Syria, Croatia, Russia, Vietnam, and Estonia). The pupils were asked to identify in writing what they saw in selected masterpieces from the Finnish golden age. The pupils were allowed to make their own choices from nine artworks:

1. Albert Edelfelt: *Leikkiviä poikia rannalla* (*Boys on the shore*) 1884
2. Helene Schjerfbeck: *Toipilas* (*The Convalescent*) 1888
3. Hugo Simberg*: Kuoleman puutarha* (*The Garden of Death*) 1896
4. Hugo Simberg: *Haavoittunut enkeli* (*The Wounded Angel*) 1903
5. Eero Järnefelt: *Raatajat rahanalaiset*, *Kaski* (*Under the Yoke [Burning the Brushwood]*) 1893
6. Albert Edelfelt: *Ruokolahden eukkoja kirkonmäellä* (*Women of Ruokolahti on Church Hill*) 1887
7. Akseli Gallen-Kallela: *Aino triptyykki (osa)* (part 2 of the *Aino Triptych*) 1891
8. Akseli Gallen-Kallela: *Lemminkäisen äiti* (*Lemminkäinen´s Mother*) 1897
9. Hugo Simberg: *Halla* (*Frost*) 1895

These works of art are among the best-known paintings representing the Finnish golden age at the turn of the twentieth century, and their creators were involved in the national project to construct Finnish identity.

We analyzed the pupils' written observations by asking how they understood these "national masterpieces" and in what way their understanding might be connected with the original historical context of the artwork or with other cultural contexts that were more relevant to each of them. The contents of their writings were analyzed qualitatively in two phases (see, e.g., Alasuutari 1993, 21–26). First, we analyzed all the writings about one particular painting, trying to emphasize the variation in the children's interpretations; thereafter, all of the analyses were explored for their wider concepts. Our analysis has some features characteristic of grounded theory methodology (Strauss & Corbin 1994) and highlights naturalistic data as a starting point for the conceptualization of the phenomenon under inquiry. However, in this chapter, we do not intend to present a complete "theory" as a result of this phase of the research together with a fully constructed conceptualization and conceptual relationships of the phenomenon.

Our phase of analyzing art understanding could be identified as recipient-centered (Räsänen 2008, 167–72, 217–18), where the focus is on the reception context, the viewer's context of the message, not the sender's or the artmaker's or the original historical context. Thus, our analysis is a typically qualitative, data-based, discretionary sampled inquiry in the sense that we had no specific theory-based hypotheses for the interpretations, but were open to all possible meanings the children might construct within their own cultural contexts (see, e.g., Eskola & Suoranta 2001, 18–20, 151–52). By describing and conceptualizing the meanings that pupils of multicultural backgrounds gave these Finnish national artworks, we were endeavouring to understand the need for fruitful pedagogical interaction within the framework of basic education where this diversity is taken into account.

RESULTS

We chose three paintings out of nine possibilities from our data for this first-stage analysis, because the study concentrates on cultural identity issues. In order to understand the children's interpretations, we must first give a short introduction to each of the selected artworks. Thereafter, we present some examples of the children's written interpretations and analyze them. Here, cultural identity factors are limited to gender, ethnic background, and religion, either because other factors are the same (age and locality) or were not taken into account at this point (skills, social background). Some of the pupils with foreign ethnic backgrounds have Finnish nationality, some have dual nationality, and some are citizens of their original home countries. They all speak Finnish at school, but all pupils with a foreign background speak other languages as well or have a different native language. The diversity of these classes is striking in many ways.

Under the Yoke

Under the Yoke by Eero Järnefelt is a realistic painting of the hard work that was required to clear the fields for crops. Burn-beating is an old agricultural method in

Figure 1. Eero Järnefelt: Raatajan rahanalaiset / Kaski (Under the Yoke [Burning the Brushwood]) 1893. Oil on canvas.

which felled trees are burned on a site planned for cultivation. The ash made the fields fertile. Burn-beating was a common practice in the eighteenth and nineteenth centuries. It was heavy work in which the whole family took part. If there was no crop to harvest, then the family not only remained poor, but also went hungry. The Finnish name *Raatajat rahanalaiset* connects this painting to the *Kalevala*. Järnefelt wanted to create a realistic panorama that portrays the simple, hard-working Finnish people. A portrayal of this aspect of Finnishness was a radical act in a class society, especially as the girl is looking straight into the eyes of the (presumably) high-class viewer.

The pupils' written interpretations of the painting *Under the Yoke* (N = 24) could be categorized into seven themes, which recurred in their texts. The children described the feeling given by the image in very similar ways, but they gave various explanations for the misery, such as slavery (n = 6):

> The slaves at the dump. The slaves are at the dump, because they are made to clean it. They have had it harsh for a week. They have cleaned so much that they are sweaty. The kids are really hungry. Sufferus, Meanimus and Dirtymus. (A girl, Congo, Christian)

The flames were interpreted as fire or explosions (n = 7) and as people being rescued:

> The picture is called Save the Village. There is a girl and a boy putting out the fire while saving the village. After this happening, the village is saved. (A girl, Somalia, Muslim)

The ground burning was also seen as a volcanic eruption (n = 3):

> Volcano. I see two girls who are orphans in the picture. Their parents have died from a volcanic eruption. Their aunt is coming to get them from the volcano. This is a tragic story. (A girl, Somalia, Muslim.)

The painting was also interpreted as an unidentified disaster (n = 1), poverty (n = 1) and field work (n = 1).

Only one child somehow spontaneously linked the contents of the painting to its historical context by describing field work in times past. The theme of poverty can also be loosely connected to historical context. All the others constructed the meaning of the painting far outside its "original" context in ways that were more relevant to them. It was obvious that none of these young writers spontaneously identified the cultural codes in the painting, which for example link it to the *Kalevala* and to the discussion of Finnish national cultural identity at the turn of the twentieth century.

Lemminkäinen's Mother

Lemminkäinen's Mother by Akseli Gallen-Kallela depicts a scene from the *Kalevala*. The warrior Lemminkäinen has been killed, his body hacked to pieces and thrown into the river that flows through the underworld, which is called Tuonela. His mother, having collected the parts of her son from the river and sewn them together again, looks up to see a single bee bringing Finnish honey that will bring her son back to life. This painting is an example of seeking true Finnishness in stories of the national epic, the *Kalevala.* The *Kalevala* poems were collected in the region of Karelia, where the spirit and power of the original Finnish people was also thought to reside.

There were many similarities in the writings about *Lemminkäinen's Mother* (N = 14). Most of them described a dead man and a woman who was there to help or to witness the situation.

The stories varied mainly on the basis of the cause of the man's death (war, 4; murder, 3; accident, 2; unknown, 2; unmentioned, 3) and in the relationship between the main figures (mother-son, 5; wife-husband, 3: friends,1; siblings, 1; strangers, 4) .

> Mother and her child. The mother´s child was shot with a bow. The mother was very sad, because her son was dead. (A boy, Lebanon, Muslim)

> A murder. The woman´s friend has been cruelly murdered. I see a woman who mourns her dead friend. There has been a lot of bleeding, and the path of stones is covered with blood. The woman is sad and wants to stay with her friend for the last time. The atmosphere is sad and gloomy. (A girl, Finland, Christian)

> The death. There are two people in the picture, and it tells that the man has fainted. The people in the picture are a mother and a son. The mother tries to

Figure 2. Akseli Gallen-Kallela: Lemminkäisen äiti (Lemminkäinen´s mother) 1897. Tempera on canvas.

> wake up her son, but does not get him to wake up. Before this picture, the man was hit by a doorknob. Later he dies. The atmosphere is sad. (A girl, Serbia, Christian)
>
> Help, can somebody help? A man is lying on the ground, and he seems not to have any clothes on. He looks pale, he has yellow hair and a yellow beard. The man lays on asphalt with skulls and some things next to him. Somebody has come to help the man. She tries to calm down the man who shudders. The woman shouts: "Help, can somebody help?!" But nobody come to help. The woman looks at the sky and starts praying to God for help. But the man stops breathing and dies. The woman is scared, because she doesn´t know who the man is and what is going on…. (A girl, Turkey, Muslim)

Again, it becomes clear that these interpretations lack the cultural codes that link this painting to the *Kalevala* or to Christian symbolism in the painter's design and therefore to the discussion on Finnish national cultural identity in the golden age of Finnish art history. However, the children do get the feeling of the message and keep trying to piece together what has happened and why by giving various explanations that are relevant to their own way of understanding.

Aino

Aino by Gallen-Kallela depicts another scene from the *Kalevala*, one that shows Karelian landscapes and attire. Aino was a young girl who was promised in marriage to the old and wise Väinämöinen after her brother lost a magic singing match to Väinämöinen. Aino was so distraught at the prospect of this marriage that she decided to drown herself. The middle panel depicts the end of the story. Väinämöinen used his magic to try and find Aino in the lake where she has disappeared. He catches a small fish, but decides it is too plain and insignificant to be his fiancée, so he throws it back. In that instant, the fish changes into Aino, who proceeds to mock the old man who had her in his hand, but chose to let her go. Then she vanishes forever.

Among the children's interpretations of the painting *Aino* (N=16) there were mostly stories about a (real-life) man who tried to get or hurt a girl (7) and fairy-tale creatures (9) in somewhat similar situations. Only one pupil used the name Väinämöinen from the *Kalevala*, but no one connected the painting to the *Kalevala* story.

Figure 3. Akseli Gallen-Kallela: Aino triptyykki (osa) (The Aino triptych, part 2) 1891. Oil on canvas.

> An old man. I see a young woman and an old grandpa who tries to catch her. Before this happened, the woman was swimming, and the old man rowed over to her. The man tried to grab her to put her in his boat, even though the woman does not want to come. The man is disgusting. The atmosphere is horrible because the man is old and evil. (A girl, Finland, Christian)
>
> The woman. I see a woman in the picture. She is running away from an old pedo-man. Before this moment, the woman was taking a walk. She was hot, so she went swimming. After that, the old man tries to get her into his boat, and the woman starts to run away. After a moment, she starts to scream and she gets saved. The atmosphere is disgusting. I think this picture is not very nice. (A girl, Morocco, Muslim)
>
> The troll was lonely. He did not have any friends, because he was hated for being ugly. The troll wanted to have a fish for a starter, so he went fishing. In the end, the troll saw an underwater-woman, who tried to save seven fish the troll had caught. The troll realized that there was some kind of beauty in that woman. The troll wanted to catch the woman. The woman dropped the seven fish and ran away. At the end the troll caught the woman. (A girl, Somalia, Muslim)
>
> A mermaid. A man was fishing on a beautiful day. He sees a naked woman swimming; the woman has blond hair. The woman notices the man and starts swimming away. The man tries to catch her to let her to warm up in a boat. The woman disappeared under the water. The man thought that maybe she was ashamed of being naked in front of a man. Or maybe she was a mermaid. (A girl, Turkey, Muslim)
>
> A boat trip. This picture is about Väinämöinen trying to catch the mermaid. Väinämöinen was the cleverest man in the world. (A boy, Finland, Christian)

Perhaps the painter's decision to make the mythical figure of Aino translucent caused some of the children to interpret the image as a fairy tale. Yet despite their different cultural backgrounds, these children shared the same fairy-tale creatures in their stories. The shared cultural codes existed, but they were constructed from sources other than the painting's original, historical context.

DISCUSSION

The study shows that the interpretations were diverse and that there was no clear and direct connection between the interpretation and the ethnic background of the pupils. No such assumptions can or should be made. None of the children, regardless of their cultural identity, could "read the codes" in the paintings as they were meant or interpreted in their original context at the time of the golden age. All pupils could,

however, interpret the main situation in a given picture and were able to tell some kind of story connected to the image seen.

Where art is concerned, everyone has a right to his/her own opinion and interpretation. Yet the (cultural) context of the receiver is always brought to the experience of viewing the work of art. The study shows the importance of the surrounding society and also of the cultural context in which a pupil spontaneously interprets a picture. In the interpretive process in a visual culture, a viewer connects representations to the pictures that are characteristic of their culture as well as to pictures they have seen earlier along with mental images. We must also take into consideration that visual representations can be analyzed from mimetic, intentional, or constructivist perspectives (e.g., Räsänen 2008, 214; Räsänen 2012; Hall 1997; Mäkiranta 2010). The cognitive process is influenced by personal differences, the individual stage of development, social relations, and society, including the media and their visual imagery. Our results had some interesting connections with Parsons' (1987) theory of aesthetic development. Knowledge is built by associative experiences and transcends historical, cultural, and disciplinary borders. Since locality is seen as one of the dominant factors in cultural identity, these results suggest that immigrant children learn the cultural codes of their new location and peers quite quickly.

The study also shows the importance of teaching visual literacy and multi-literacy. Pupils need guidance in finding and interpreting messages in pictures. Even though there was plenty of information in the paintings shown, there was also a lot of concealed knowledge. There may not be any common interpretations of visual messages, and interpretations may vary, depending on the cultural background of the viewer. However, cultural background is a much wider concept than ethnicity alone. Even though there may not be many common cultural codes to begin with, pupils seem to be quick to learn and create new codes. The results support the pedagogical approach whereby visual output is seen as cultural communication, and multiculturalism and diversity are resources for learning instead of being disadvantages. Multi-culturalism should thus be accepted and encouraged.

This study has its limitations at this stage. It was carried out at only one school, so the children's visual arts education before the study could have influenced the results. The finding could well be different if the pupils had more background knowledge of the particular paintings shown. Also the number of pupils taking part in the study was rather small. The cultural identity factors that were taken into consideration were limited and superficially defined. For example, the length of time a particular pupil had stayed in Finland was not shown. However, some information for interpreting the golden age paintings in fresh ways has been generated. Also the diversity of certain Finnish classrooms today has been demonstrated. The study also sheds new light on the quality of diversity in multicultural classrooms in contemporary Finnish schools. A data analysis of the first phase of the study has provided useful information for further developing this approach using multicultural visual art education practices.

Teachers should not make uninformed assumptions about the kinds of diversity and ideas that immigrant children bring to the classroom. Our (hybrid) cultural identity is based on narratives that are also visual. By learning to understand those narratives, we forge a personal connection with them and with the roots of our homeland and therefore enhance our cultural identities. Since multicultural visual arts education can be seen as intercultural communication, it is important to strengthen our children's communication skills and become visually literate.

Research with children requires particular sensitivity. This must be taken into account both in terms of ethical considerations and analysis of accounts by children. The data extracts presented here refer to rather dramatic circumstances, such as war or violence. Some of these may stem from actual events that took place in the children's family history or society and are brought to mind by these visually powerful artworks. The research thus emphasizes the powerful role of the teacher who is aware of this interaction process in classroom.

The goal of the current Core Curriculum for Basic Education is to understand the essence of Finnish culture (as part of European culture) and being Finnish as a part of the Finns' cultural identity. These golden age paintings are deemed part of our cultural identity and were created for the purpose of constructing that identity. That raises some important questions. Is culture (still) seen as a regional phenomenon in our curriculum instead of hybrid and random? How can "Finnishness" be identified or defined? These issues should be researched before a fruitful pedagogy for multicultural visual arts education can be planned on the basis of the goals in the Core Curriculum. The golden age paintings can be seen as a part of our history and part of the national project to construct a Finnish identity. These artworks thus portray a certain congenial image of Finnish people. This is obviously not the whole story, but it is one viewpoint. For teachers, this is a useful source of discussion about the new, wider meaning of "Finnishness" today as a theme of diversity and tolerance. According to the plans for the next Finnish National Core Curriculum in 2016, issues of multi-literacy are considered important. Thus, in multi-cultural visual arts education, it is essential to learn to communicate with these cultural symbols and messages.

The visual arts provide a functional meeting place for cultural issues. A work of art can be seen as a neutral and unbiased starting point for discussions and learning processes, as well as opening a forum for opinions. The experiential learning process of art can be helpful, for example, in broadening the definition of being Finnish and in accepting the diversity and multi-cultural aspects of Finnish society today. Visual arts education enables the goal-directed teaching of visual literacy. If there are difficulties understanding the messages in a society, then there is greater chance of alienation. In this context, the meaning of visual literacy can be seen as a skill for coping with everyday life. In addition to understanding the hidden messages in pictures, it is also important to understand and accept the diverse visions of our multicultural society.

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9. WHAT KIND OF LEARNING IS INTERACTIVE AND MEANINGFUL TO GIFTED SCIENCE STUDENTS?

A Case Study from the Millennium Youth Camp

INTRODUCTION

The aim of this chapter is to discuss what kind of learning would be interactive as well as meaningful in teaching gifted science students. Students are identified as being gifted based on their earlier school achievements and projects (see Table 1). The research reported here is a multiple-case study of five international students who attended the Millennium Youth Camp (MY Camp) in Finland in the summer of 2012. The students belonged to the ICT (Information and Communication Technology) group and consisted of one female and four males. All of the students were interviewed before and after the camp about their learning goals and experiences. Critical incidents in their learning histories as expressed in the interviews were explored and compared to other populations of gifted science students.

The chapter first presents earlier research and a theoretical framework for studying gifted science students as learners. Second, we introduce the criteria for meaningful learning given by Jonassen (in Jonassen, Howland, Moore, & Marra 2003, 6–9) within the framework of educational interaction. Our focus is on the interactive nature of student teamwork and the importance of interaction in actualizing meaningful learning. Through this emphasis, we adhere to the theme of this book, which is interaction in educational domains. Third, we present our data and methods of investigation and then the results of the students' critical incidents as given in their learning histories. Fourth, we explore meaningful learning and interaction in the Millennium Youth Camp as experienced by the five students in a teamwork assignment to determine how ICT can improve literacy in developing countries in cooperation with the children's development organization called Plan International and the mobile telephone company Nokia. Finally, we discuss the role of programs like the Millennium Youth Camp in promoting meaningful learning and social interaction among gifted science students.

GIFTED SCIENCE STUDENTS AS LEARNERS

Previous studies on the ideal learning environment for gifted students support the importance of a holistic environment (Tirri 2011; 2012). Educational

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 131–145.

recommendations for gifted students in science acknowledge the need for social and emotional support for students' personal growth (Tirri & Kuusisto 2013). Students themselves have also emphasized the role of community in their learning. "Community" includes teachers and like-minded friends. Furthermore, gifted students need a special curriculum with advanced content that reflects their interest in science and technology. They also want to study at a fast pace, and they want to be given new learning challenges (Tirri 2012).

Earlier studies on actualizing talent in science have shown that gifted science students have a strong inner drive to learn (Tirri 2002; Tirri & Campbell 2002; Tirri & Koro-Ljungberg 2002). The common factor among Finnish students who have competed in the International Science Olympiads has been the constant desire to learn new things and to be challenged intellectually. Moreover, all have been independent learners at school, and all have received support and intellectual stimulation from their families. During their school years, both male and female scholastic Olympians enjoyed academic competitions and the Olympiad experience. International cooperation has been identified as the most influential factor for academic success, and the best-known researchers among these Olympians have used cooperation in their work and have published in international journals (Tirri & Koro-Ljungberg 2002).

MEANINGFUL LEARNING AND INTERACTION

Theories of teaching and learning with a focus on student activity are usually based on constructivism. Constructivism has many faces (Phillips 1995) and a long history in cognitive psychology (Piaget 1952). What all approaches to constructivism have in common is the idea that the important thing is what the learner has to do to create knowledge (Novak 1998). Knowledge is created by the learning activities of students and leads to a conceptual change in their thinking. According to Biggs, a conceptual change takes place when the learning objectives are clear and when the students experience a need to achieve those objectives. Furthermore, focusing on the learning task and working collaboratively with both peers and teachers also contributed to conceptual change (Biggs 2003, 12–13). Situated learning theory (Lave & Wenger 1991) emphasizes the importance of communities of practice and learners as a crucial aspect of the learning process.

Jonassen (1995) advocates a constructivism that emphasizes situational aspects in learning. His attributes of meaningful learning adhere to Biggs's ideas of quality learning together with the importance of communities of practice, introduced by Lave and Wenger. According to Jonassen et al., meaningful learning is active, constructive, intentional, authentic, and cooperative and should meet the following standards: collaborativeness, authenticity, constructivity, activity, and intentionality (Jonassen, Howland, Moore, & Marra 2003, 6–9; see also Jonassen 1995). These qualities can be described by the following criteria:

Cooperative and collaborative learning (Collaborative/Conversational): Learners work in learning- and knowledge-building communities, exploiting each other's skills while providing social support and modeling and observing each other's contributions.

Authentic learning (Complex/Contextualized): Tasks are situated in some meaningful real-world task or are simulated through a case-based or problem-based learning environment. Otherwise, learners have no idea how to relate the ideas to real-world contexts.

Constructive learning (Articulative/Reflective): Learners assimilate new ideas into prior knowledge in order to make sense or meaning or to reconcile a discrepancy, curiosity, or puzzle. In meaningful learning, it is essential that learners articulate what they have accomplished and reflect on their activity and observations. When learners are curious or puzzled, the puzzlement is the catalyst for meaning making. Reflecting on the puzzling experience, learners integrate their new experiences into their prior knowledge about the world, or they establish goals for what they need to learn in order to make sense of what they observe.

Active learning (Manipulative/Observant): Learners are engaged by the learning process in the mindful processing of information, during which they are responsible for the result. The meaningful learning process requires learners to be actively engaged in a meaningful task in which they manipulate objects and parameters in their environment while observing the results of their manipulations.

Intentional learning (Reflective/Regulatory): When learners are actively and willfully trying to achieve a cognitive goal, they think objectively and learn more, because they are fulfilling an intention. (Jonassen, Howland, Moore, & Marra 2003, 6–9; Jonassen 1995, 60).

Tirri and Nevgi (2001) conducted an empirical study on the qualities of meaningful learning with adult Finnish students (N=412) in the context of a virtual learning environment. According to their quantitative survey, the students identified more advantages than disadvantages in virtual teaching and learning. The advantages included qualities, such as constructive and collaborative learning, intentionality, and activity, all of which are included in Jonassen's list of qualities of meaningful learning. In addition, students identified transfer, individual learning environment, teachers' feedback, and support as advantages of a virtual learning environment. In another study of teachers' views on meaningful learning in the context of applied theological studies, Jonassen's criteria were explored (Tirri, Sorri, & Pruuki 2006). In general, the criteria also worked well in that context. The authors suggested a modification of Jonassen's theory by adding a teacher to the student's learning process. The importance of a teacher was seen in relation to every criterion of meaningful learning (Tirri et al. 2006, 232). In the context of applied theological studies, meaningful learning required active interaction between learners and teachers. This interaction was needed for intentional learning in which students and teachers plan learning goals together.

DATA AND METHODS

The aim of this study is to examine what kind of learning is meaningful to gifted science students and kind of learning counts as interactive. We also explore critical incidents in the students' learning history. The study is a multiple-case analysis of five international students who attended the Millennium Youth Camp in Finland in the summer of 2012. The Millennium Youth Camp is geared to 16- to 19-year-old students who are gifted in science (Tirri & Kuusisto 2013; Tirri, Tolppanen, Aksela, & Kuusisto 2012). The camp has been held in the summers of 2010, 2011, and 2012, and each year the number of applicants has increased. In 2012 the number of applications was over 1,600. The top thirty applicants were chosen, based on their giftedness and reasons for wanting to study science (Vartiainen & Aksela 2012). The camp is organized by Finland's Science Education Centre LUMA and the Technology Academy Finland (Finland's Science Education Centre LUMA, 2013).

The students, one female and four males, belonged to the ICT group. Their background information is presented in Table 1. All of the students were interviewed before and after the camp about their learning goals and experiences. The interviews were analyzed with both deductive and inductive content analysis. Each student was considered an individual case, and the cases were compared to form a multiple-case study.

CRITICAL EVENTS IN THE LEARNING HISTORIES OF STUDENTS IN THE ICT GROUP

Family

The socio-economic status and the education of the students' parents varied in the same ways as in previous studies of Finnish academic Olympians (Tirri 2002). However, the common factor in this group was a supportive family environment. Their parents had supported them by valuing education and by their own examples. They had also encouraged the children to study by helping them make the right choices about schooling. However, the independence of these learners could be seen in their own inner drive, which guided most of their interests. In the following example, a male student describes the influence of his mother on his choices:

> My mother has always been a math teacher. I'm fairly certain that I've inherited my numeracy and general understanding of logic from her. But to be honest, I rarely ever ask her about math-related questions and have always been independent in these matters. (Justas, Lithuania)

Inner drive was the most important thing in Justas's case, even though his mother was a math teacher and capable of guiding her son in his interests. We can still conclude that the family environment was supportive. Justas also shared the fact that his father is a horologist, who provided all kinds of technology for his son to explore during childhood. This was a critical incident in Justas's learning history.

Table 1. Background of the ICT group.

Name *Country* *Age*	*Interests*	*Achievements*
Alex Romania 17	hardware and software, mobile and web applications, networks and interface design, to tackle a big world problem	– 1st place in AcadNet, a national contest held by Cisco Networking Academy at the Polytechnic University in Bucharest – 11th place and honorable mention at InfoEducatie national project contest, sponsored by Google – finished Stanford Online classes: Introduction to Databases, Machine Learning, and Introduction to Artificial Intelligence.
Justas Lithuania 17	math, sciences, languages, especially English	– 2nd place in nationwide physics contest in 2010 – 15th place in the nationwide "Kangaroo" contest (a math contest with ca.10,000 participants), 2009 – 3rd round of Lithuanian Olympiad in Informatics, 2011 – honorable mention in another informatics contest, 2010 – best physicist in his grade in his city – in the ranks of the top programmers – 1st place by a wide margin in the English Olympiad 2008 – 2nd best in his country in the National English Olympiad of 2012
Mike China 16	intensive programming, (dis)assembling and playing with underlying software and hardware, user-end products design, network architecture	– published applications: BitTorrent application on iPhone or iPad, a Linux kernel extension, a more sophisticated kernel extension on Mac OS X
Pablo Spain 18	computer engineering, math, physics, industrial technology, programming languages	– on a high school physics team to participate in the Physics Olympiad 2012 – published a regional newspaper article about research on grafeno and carbon nanotubes at the University of Zarogoza

(*Continued*)

Table 1. Background of the ICT group. (Continued)

Name *Country* *Age*	*Interests*	*Achievements*
Valeria Bulgaria 16	science, math, informatics, physics, especially bioinformatics	– won a Bronze Medal at the International Mathematics Competition, 2010 – won a Bronze Medal at the International Zhautykov Olympiad, 2011 – speaker at the TEDxLPBT conferece, January 15, 2011 – carried out research work in Bioinformatics: Gene Prediction Using the LZW Data Compression Algorithm, which presented a unique approach to problem solving. The paper was presented at the High School Summer Institute (HSSI) conference and received an award for excellence in 2011 – invited to present her research at the international conference InfoTech11 as well as at Expo-Sciences International, where she won a medal in 2011. – participated in a three-week HSSI Research Summer Camp in 2012

Another example of the importance of family is mentioned in the following excerpt from the only female student in the ICT group. Here Valeria praises the support of her family in encouraging her interest in science:

> And my parents and my family have always been happy with my decision because my grandfather is an engineer, so my family doesn't think science is a bad thing, which helps if you want to be involved in it. All the money I need for going to competitions comes from my parents. We are not rich or anything, but they always manage to send me where the chances are. (Valeria, Bulgaria)

School

On the whole, the students had positive school experiences, and all of them, like the academic Olympians, were excellent students (Tirri, 2002). Furthermore, they all emphasized the role of good schools and teachers in their learning history. Our data also showed that all the students mentioned early experiences related to technology and computers as being critical events that helped them in actualizing their talents. The following quotation from Mike demonstrated the importance of computers for these gifted science students:

> I first touched the computer, I think, at the age of four. Then, during the 4th and 6th grade at my primary school in ShenZhen, I played with computers a lot. Not exactly games, well, something, but mostly actually playing around with different software. Downloading different types of software and trying them out. I don't know why I found them interesting, but I did at that time. (Mike, China)

The students also identified good teachers as critical events in their life histories. Many of their parents were teachers, who chose good schools and good teachers for their children. Pablo described the importance of high school for developing his talent as follows:

> The second critical point is my high school. Because teachers from my high school are always looking for ways to help you, and when I ask them for help, they always help me. And they have always wanted me to research more and teach me more about how to look for things on the Internet. (Pablo, Spain)

Competitions

Four of the five ICT students had enjoyed academic competitions during their school years. Two of them had trained or taken part in academic Olympiads. In our earlier studies, we identified a competitive mind as being a characteristic feature of gifted Finnish female scientists (Tirri & Koro-Ljungberg, 2002). The males seemed to enjoy the competitions even more than the females (Tirri, 2001). In the interviews, all of the ICT students emphasized the importance of competitions for their identity and talent development. Competitions were also occasions to meet and interact with like-minded friends. Valeria loves to compete and in the following excerpt, she talks about her experiences in competitions:

> I have competed in contests of all kinds through the years, from individual intramurals to online teams. I have won prizes from some of the most prestigious national competitions in these fields, but I have also gotten medals at international competitions. My other true passion is in the field of Bioinformatics. (Valeria, Bulgaria)

Justas had the widest scope for contest participation. In addition to physics and mathematics, he had taken part in debating and English competitions (see Table 1). In the following quotation, we can see his competitive mind and his many talents:

> First of all, I have been very interested in Olympiads and in competing in general. Ever since middle school, I have, more or less been competing. At least, I was generally good, especially in math and English Olympiads. When I came to high school, the number of contest possibilities and generally in places to compete increased. And I picked up a new hobby when I came to high school. This hobby was debating. And with the debating team, we have travelled a lot in Lithuania and beyond. My English is top-notch, by the way, as shown by me taking first place by quite a margin in the English Olympiad held here in 2008. (Justas, Lithuania)

Future career plans

All the students in the ICT group wanted a future career in science, and four of them expressed an interest in studying abroad in one of the most famous universities in the world. Stanford and MIT were the top choices in the United States. The United Kingdom was also mentioned as a country with good schools. Earlier studies of Finnish academic Olympians showed that making the right career choice was one of the critical incidents in developing students' talents. The most successful researchers were those Olympians who had been able to choose the right field, for example, mathematics or computer science; they became internationally known researchers in that field. Five academic Olympians out of twelve mentioned studies abroad as a critical event in their lives (Tirri & Koro-Ljungberg 2002). These Olympians were the most well-known researchers with the liveliest publication activity of all the Olympians. Our research shows that studies abroad have a crucial impact on the career development of Finnish scientists. The students in the ICT group were also aware of this, and it showed in their interest in studying abroad. One of them, Alex, had taken an online university course offered by the head of the Artificial Intelligence Laboratory at Stanford University. The teacher, who gave up a tenured academic position, now manages Google's project of self-driving cars. In the following excerpt, Alex tells about his future plans on which his online education had an enormous effect:

> My dream workplace will be in the computer industry. I would like to work with some real issues, something that will use data to change the world, don't know really what, not domain display advertisements or getting 5 dollars a month for playing music or something. I want something not so money oriented. (Alex, Romania)

MEANINGFUL LEARNING AND INTERACTION IN THE MILLENNIUM YOUTH CAMP

Cooperative and collaborative learning

According to Jonassen, in cooperative and collaborative learning, students work in learning- and knowledge- building communities, exploiting each other's skills while providing social support and modeling and observing each other's contributions. The teams in MY Camp were built on the ideas of cooperative and collaborative learning. Each theme group in the camp had a mutual learning task, which they had to solve collaboratively. The ICT group's project was to create solutions for how ICT can improve literacy in developing countries.

The students started on the project even before the camp began, using the e-learning platform Moodle (Modular Object-Oriented Dynamic Learning Environment) to exchange ideas, discuss questions asked by their leader, and begin a debate. However, because the pre-camp use of Moodle was somewhat limited, the students essentially re-start the project work from scratch when the camp began.

They also had to put a great deal of effort into getting to know each other and finding out the expertise and personalities of each group member. As a result, the first days of camp were challenging for team collaboration:

> The first days were like more difficult than the last ones because you didn't know the people. You knew them through Moodle, but it's not the same if you are face-to-face with them, and you are talking to them at the same time. So the first days were like a little uncomfortable, because you have to know how these people are thinking, how these people want to work, and how we are going to develop this project. But in the end I think, this team has been really comfortable for me. We have had a lot of communication between one another, and I think we have been getting along very well. And if we are friends, I think the cooperation is better. So in the end, I felt very comfortable in this camp and in working with them. It has been very nice. (Pablo, Spain)

As Pablo observed, getting to know the team members and building trust were prerequisites to the students' meaningful collaboration, interaction, and learning. Setting goals, sharing responsibilities, and creating rules were not easy tasks for students coming from different countries and cultures. For example, Mike, who was the only student from Asia, felt that the European collaboration style with its rigorous arguments and debates was painful, even though it generated excellent ideas:

> We did have to argue for our cases ourselves. I am not saying it's a bad thing, but it's just that it makes collaboration painful. It's just this process. Yeah. We're getting the greatest ideas. But in this process, all your energy is gone. I mean, you spent so much of your energy telling other people why and why and why. Perhaps you even had to use pathological and ethical persuasions, and I think that was not our original purpose. I think, yes, we need to argue in our cases, but we do not need to use "pathos and ethos." We use reason if we go over that level. Maybe for some people, if they have the passion, maybe it's good, but for me, it drains my energy. (Mike, China)

On the other hand, Alex found the same debates interesting, but also observed that the discussions took too much time away from actually implementing and conducting the project work:

> It [the teamwork] was really nice because we had some debates, interesting debates, worked as a team. […] [However] I think the problem was that we talked too much and didn't do the practical stuff. (Alex, Romania)

The rigorous interaction had some advantages; it helped students learn their team members' personalities, their areas of expertise, and their styles of communication. When the team eventually overcame the difficulties, all of the students reported that the teamwork was one of the best experiences they had at the camp; they believed that they had learned a lot from each other and even completed each other.

Authentic learning

According to Jonassen, authentic learning takes place when the learning challenges are situated in some meaningful real-world task or are simulated by some case-based or problem-based environment. Otherwise students would have no idea about how to relate the ideas to real-world contexts. All of the students in the ICT group emphasized the importance of working with real-world problems. The use of ICT to improve literacy in developing countries was a learning task that was challenging, ethical, and concrete for these gifted students. In their earlier projects at school and elsewhere, they had practiced this kind of authentic learning. They appreciated the fact that their project task was incorporated into the work of Plan International. The students also visited the main office of Nokia and obtained valuable information about Nokia's social awareness projects in developing countries:

> [I learned] a whole bunch of new information about education in developing countries, the main topic. […] All the talks with Mika from the Plan organization and with the woman from the Nokia social center really helped me understand the schools in Africa better, the problems, and how could we help them. (Alex, Romania)

> In the project, I have learned [what it's like] being with a company like Nokia and with people who are working in development countries like Plan [International]. The project has been awesome, because you can really address the problem, and you are dealing with the real problem, and you can learn lots of things. (Pablo, Spain)

> This week was an opportunity to hear more about them [the ICT solutions] from people who actually study these things and are well aware of them. (Justas, Lithuania)

However, Mike expressed doubts about the learning task and its authenticity. In the following excerpt from the interview he gave at the beginning of the camp, he reflected on the nature of the group's task in the framework of authentic learning:

> To be honest, I don't really expect to develop any new idea for ICT in education. Because it's still being explored, I think, a lot of difficulties in real-world applications have been raised – distances and costs, lots of things. It is actually a matter of to do or not to do in the real world other than having to do, from my point of view. I think during this camp we will sum up some of the points and probably discuss them further, but eventually our presentation will still be based on the existing solutions that we just find on the Internet. (Mike, China)

Mike's comment reflects his idea that the learning task did not provide an opportunity to invent something innovative for use in the real world. Mike himself had spent many years learning to hack real-world databases and develop better security

systems for them. The learning task at MY Camp was not sufficiently concrete for his innovative hacker mind. In addition, during the camp, the students had only five days to complete their project work, which limited their chances of carrying out more profound research.

Constructive learning

According to Jonassen, learning is constructive when people accommodate new ideas into prior knowledge in order to make sense or create meaning or reconcile a discrepancy, curiosity, or puzzlement. In meaningful learning, it is essential that learners articulate what they have accomplished and reflect on their activity and observations. For example, in the interview after MY Camp, Mike reflected that he understood the project was not about solving the problem as in real-life work assignments. Instead, he saw that the purpose was to educate the campers to find and generate their own purpose and vision and learn how new knowledge is constructed in science:

> I think this project, it's really not about the work that we do. It is about generating passion and giving insights. […] I said at the beginning of the camp that I did not expect much [in the way of] new ideas; I thought we would just be combining information from papers that really had something new. Even though we didn't develop something new, since what we used was someone else's work, we did incorporate their ideas [into our project], and that is something new. (Mike, China)

In addition, the students had to play a role on their team, which changed their earlier ideas about their strengths. According to Valeria, her strength was in algorithms, and she expected to use that strength on the team. However, her role changed to something that she had not expected. In the following excerpt, Valeria talks about this change:

> At the start, we didn't know each other. We just had some kind of knowledge about each other based on Moodle. And when we met, we spent so much time with each other, and it appeared that, in the end, things had changed from what we had expected. I think I was not an expert on some point, because I am into algorithms, and there were no algorithms. So I think I was something like a manager or maybe half of this, and I also worked on the text stuff. Removed all the fancy words and yeah… (Valeria, Bulgaria)

Valeria had to get used to a new role, one that she was not prepared for ahead of time. She expected to apply her knowledge of algorithms on the team, but she ended up doing other kinds of tasks, such as managing the work of the project. Evidently, she experienced meaningful learning in constructive ways and afterwards reflected on her accomplishments and team activity.

Active learning

According to Jonassen, activity in learning means that the learners are engaged in the mindful processing of information. Furthermore, they are responsible for their own learning results. The students selected for MY Camp were asked to describe their interests and achievements and their reason for applying to the camp. They were also asked about what kinds of things they wanted to learn there. An important part of learning in the camp was the project on which the students had to work together. The project required active learning from each student as an individual. After the beginning struggles, the students shared the responsibilities for the task, based on their strengths. This is how Mike described their roles and responsibilities:

> Val is a really good example, like a team builder, which is determined by her personality.
>
> Alex has a technical background so he knows what he is doing, which therefore generates content, and he can persuade people to [agree with] his ideas.
>
> Justas is really good at speaking. […] He is good at improvising. And he actually does research on the part that he is interested in: the approaches to learning and the Pimsleur [a language-learning program] approach.
>
> Pablo is interested in connectivity, and he has been talking about it. I think he is really passionate about what he wants. Like he is obsessed about connectivity technologies, and that's a good thing because nobody else does. So that's a part that he can play a critical role in on our team.
>
> [Mike] Yeah, actually we are lucky that everybody had a part that he or she was interested in except for me, actually. I didn't raise any point, in general [...] I am just messing around and just if anybody needs help, I do it. I did not particularly generate any part of the content. (Mike, China)

Mike's interview excerpt demonstrates that every student was actively engaged in the learning task. They were concentrating on processing contents and/or focusing on helping and supporting the team effort.

Intentional learning

According to Jonassen, learning is intentional when learners actively and willfully try to achieve a cognitive goal, an objective. Intentionality makes learning meaningful, because students think and learn more when they are fulfilling an intention. The learning at MY Camp was intentional from the very beginning. The project work started ahead of the camp dates with the help of Moodle, and the mutual learning task gave the students a direction and a goal for completing their assignment. From the interviews, we can conclude that the teamwork itself taught every student a great

deal. Each of them had their own task to complete, which contributed to their joint project. Justas described his intentions in the following way:

> I was actually the [only] other person that didn't bring a laptop, so I took a supervisory role and tried to make as many observations about the content that was there as I could and make suggestions as to how we can improve and achieve the best possible result. That aside, I tried to keep a mood going so that people would think that it is fun to continue. (Justas, Lithuania)

From this example, we can see that Justas paid attention to the social atmosphere of the group to make sure they would achieve the project objectives.

The results of the project were presented at a Gala on the last night of the camp. For the Gala, the students prepared a poster and a PechaKucha presentation. Since the ICT group had not fully developed their project before the camp, they struggled to finish in time and meet the deadline. In order to cope with the hectic time schedule, Mike thought that, as a team, they should have had a clearer general picture of the project rather than concentrating too much on details:

> You have to focus on the general picture, and then if you have time you can edit some more, and I think Toni [a member of the camp staff] also said this. I think that was really important for us to know. I think it's considered as a con against our team not to understand this thing. (Mike, China)

Mike also said that the teamwork experience in the camp gave him new personal learning goals of taking more responsibility in the future:

> I think I should have pressed my ideas more. I think for the content of the project work, I may have a few more things I can add to it. But I am still my personality, so I wouldn't. Yeah, it's something that I maybe actually will change about myself. (Mike, China)

Evidently, all the students worked intentionally and took responsibility for their own share of the work in order to achieve the ultimate learning goal assigned to them.

DISCUSSION

In this chapter, we have discussed the kinds of learning that are interactive and also meaningful to gifted science students. The research consisted of a multiple-case study of five international students who attended the Millennium Youth Camp in Finland in the summer of 2012.

The results showed that the critical incidents in the learning histories of the five ICT students very much resembled the critical incidents of Finnish students who have competed in the International Science Olympiads (Tirri 2002; Tirri & Koro-Ljungberg 2002). Moreover, the five students had a similar inner drive and the motivation to learn, qualities identified as important in earlier studies of gifted science students (Tirri & Campbell 2002; Tirri 2012). They had also benefited

from competitions and international collaboration, which are important factors in interaction among gifted science students.

The results also confirmed that the learning in MY Camp met the criteria of meaningful learning. The students were intentional, constructive, and active, and they profited from challenging and authentic learning tasks that could be transferred to real-world scientific problems. However, some suggestions to improve the learning experience were identified, based on the students' observations. For example, Moodle was not the most interactive tool for communication, and new technology that would increase interaction could be valuable to future gifted science students. The ICT team would have benefited further if there had been help available to show them how to work as a group and how to acknowledge the prerequisites of interaction and if there had been the chance to get to know each other's strengths, create mutual trust, and find ways to obtain a bigger picture of the learning task ahead of time.

MY Camp was an excellent opportunity to meet like-minded friends and to be challenged both academically and socially. During the intensive one-week period, the students worked hard on their academic project, which also improved their social and interactive skills. In addition, the project addressed ethical issues with a strong moral emphasis on global responsibility. The students had the chance to reflect not only on the scientific questions they themselves had asked in the camp's application process, but also on societal and moral questions (Tirri et al. 2012). Thus, during MY Camp the students actively focused on and discussed not only science, but also moral questions. MY Camp thereby seemed to cover aspects of social, emotional, and moral education that have been neglected in programs for gifted students (Tirri & Kuusisto 2013). Based on this research, we conclude that MY Camp offers a meaningful and interactive context for the holistic education of gifted science students. The pedagogical ideas used in MY Camp might also benefit all kinds of students in different learning contexts.

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PART III

PROGRAMS PROMOTING EDUCATIONAL INTERACTION

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KAUKO KOMULAINEN & SARA SINTONEN

10. INTERDISCIPLINARY INTEGRATION IN TEACHER EDUCATION

INTRODUCTION

The purpose of this chapter is twofold: on the one hand, to search for a meaningful form of interdisciplinary integration in order to enhance students' collaborative, associative, and creative learning; and on the other hand, to highlight the essential role of interaction in integrative teaching. Our focus is on a program to develop interdisciplinary integration in teacher education, by which we mean the activities that start with teaching the basics of separate subjects and continues to search for associations between the core of one subject in the content of another subject.

We tend to see interaction as a basis for learning. Interaction is implicitly involved in students' thinking when they connect new knowledge with old information, thereby following a socio-constructivist process (e.g., Edwards 2009), and when they find new associations in groups among scholarly topics. Through our method of integrative teaching, we are searching for new associations beyond different subjects and trying to find links between subject-specific drifts. Communication, sharing, and interaction enable individuals to be socially creative (Sawyer 2004; Mercer 1995; Edwards 2009). The focus is on understanding the process of learning within groups of individuals in specific social contexts. This theory of the "guided construction of knowledge" depends on two essential features, namely, talk as social action and the relationship between context and continuity (Edwards 2009). Mercer (1995) contends that knowledge exists as a social entity, not just as an individual possession and that the essence of human knowledge is that it is shared. This view recognizes how people construct knowledge together: "Individually and collectively we use language to transform experience into knowledge and understanding. It provides us with both an individual and a social mode of thinking." (Mercer 1995, 66–67; Edwards 2009.) We, the authors of this chapter, share the opinion that integrative teaching is one way of confirming interaction among students, between a teacher and students, and between teachers from different disciplines.

As a group of teacher educators and researchers who represent various interdisciplinary fields in teacher education at the University of Helsinki, we suggest that this kind of integration of subject topics in teaching-learning situations may enhance multifaceted collaboration among students and with the teacher. To meet and handle the challenges of integrative teaching and learning, we began several

K. Tirri and E. Kuusisto (Eds.), Interaction in Educational Domains, 149–158.

years ago to question the present teaching practices in teacher training and develop our own teaching toward a more interactive approach. We share the view that teaching should promote more comprehensive thinking, as well as subject-specific knowledge construction on the part of students.

A university lecturer in teacher education in Finland has to deal with challenging concerns; he or she is required to have the readiness to teach in a subject-based way and to cross subject boundaries in an integrative way. As well, the Finnish National Core Curriculum for Basic Education (2004) and a draft for a new core curriculum for basic education (Finnish National Board of Education 2012) include requirements for integrative teaching. How does Finnish teacher training respond to these requirements and to the challenges of twenty-first century society? Those realities, and the current culture of sharing and participation, provided the guidelines for our search for potential forms of interdisciplinary integration that would be useful in teacher education at the University of Helsinki. The goals of our study are 1) to chart the present situation of integrative teaching practices carried out by teacher educators in Finnish universities, and 2) to envisage challenges and possibilities in integrative and interaction-oriented teaching practices being implemented by teacher educators in Finland.

Below, we discuss the kind of integrative education we have in mind and have been developing and how it could enhance interaction among students as well as between subject teachers. At the end of the chapter, we provide examples of Finnish teacher educators' experiences in integrative teaching and discuss the challenges that the sharing-centered twenty-first century culture presents for current and future teachers.

DESIGNING PRACTICES FOR INTEGRATIVE TEACHING

Our study is based on the methods of developmental work research (Engeström 2001; 2012) and design-based research (Baumgartner et al. 2003, Juuti & Lavonen 2006) in its collaborative development of teaching practices (Engeström 2001; 2012; Galison 1997; Gorman 2005). The interdisciplinary development work of teaching engages participants in active, participatory, and inquiry-based actions whereby individuals learn from one another and share their individual expertise (Engeström 2012). Collaborative development requires cross-border interaction and "trading zones," as Peter Galison (1997) points out. A "trading zone" involves a common space, shared objectives, joint language, and mutual exchange beneficial to all participants (Galison 1997; Gorman 2005; Engeström 2012). Our first step in the developmental work focused on the theoretical basis of integrative teaching, assessments of needs, and the outline of a framework for integrative teaching (Karppinen et al. 2012). This stage of the study continues to inform our integrative teaching and learning practices in teacher education programs in Finland.

By "design-based research," we mean methods that "focus on designing and exploring the whole range of designed innovations: artifacts as well as less

concrete aspects, such as activity structures, institutions, scaffolds, and curricula" (Baumgartner et al. 2003, 5–6). Using a design-based research method is often a cyclic process in which successive phases can be separated. There is no standard procedure for doing design-based research, but the method's phases depend on the goals and topic areas in the process. According to Juuti and Lavonen (2006, 60–61), the following aspects are essential in using design-based research: (1) assessing needs and defining objectives, (2) an iterative design for the artifact, (3) evaluating the artifact by piloting and testing.

INTEGRATIVE TEACHING: EDUCATION FOR SHARING AND INTERACTION

In this chapter, we are approaching integration from a teacher-centered perspective. This means that subject matter or themes are primarily taught as subject-based and then used to cross over the subject's borders (e.g., discipline-based integration; see Juuti, Kairavuori, & Tani 2010). In this kind of horizontal integration, the teacher establishes general objectives and creates a coherent whole by having a broad range of vision (horizon), for instance, the scientific principle of evolution, as a background framework for the teaching. (Komulainen 2007; Sawyer 2004; 2006; Beane 1997; Malinen 1992, 73–74.) A teacher can also be seen less as a transmitter of knowledge and more as the initiator of the learning processes and a facilitator of knowledge creation (Aaltonen 2004, 54).

In different teacher education programs in Finland, there are ongoing efforts to develop more interactive teaching methods (e.g., at the universities of Jyväskylä, Tampere, and Helsinki). These initiatives are in line with current trends in developing teacher education programs in Finland, as well as with the recommendations by the Finnish National Core Curriculum for Basic Education (2004). According to the National Core Curriculum, teaching can be either subject-based or integrated. The aim of integrated teaching is to explore a subject from the viewpoints of different disciplines in order to create an overall picture of the topics learned (Finnish National Core Curriculum 2004.)

In learning, there is also a need to take into account today's learning environments, which open new paths for interaction, for example, through the integration of teaching. In recent studies, learning in general has been defined as a continuous and ubiquitous process (e.g., Kumpulainen et al. 2009, 43, 48; Barron 2006, 202). In the changing world of the twenty-first century, new learning environments are emerging (Krokfors et al. 2010; Banks et al. 2007). At the same time, the earlier physicality of learning environments is being challenged. In an extreme interpretation, the physical learning environment cannot be separated from the mental, because learning is understood as taking place in our minds (LUKE 2010, 32).

The present young generation of primary school children (ages 7 to 12) is accustomed to interacting in social, participatory settings. It is obvious that the digital culture and social media offer new kinds of tools and environments for learning and knowledge processing. According to Greenfield (2009), the problem is in the way

we are accustomed to communicating with learners at school: we often rely on older media, such as print and lectures. However, young students do not have the skills for processing such media with maximum efficiency.

Digital technology and especially the Internet are no longer tools simply for disseminating and retrieving information, but are necessary for dialogue and sharing, for interpersonal communication, self-expression and creativity, and also for entertainment. Teachers, educators, and educational researchers are now struggling to take into account the changing relations between schools and these new digital spaces in today's digitally mediated landscape in which young people spend increasing amounts of time. This landscape provides the context in which young people represent and share their life stories, feelings, and experiences, construct their identities, and learn the norms of peer group behavior (Buckingham & Martinez-Rodrigues 2013, 10–11; Sintonen 2012, 6–16). As Buckingham and Martinez-Rodrigues (2013, 13) argue, "while some commentators still appear to be inflating the bubble of technological hyperbole, or tolling the bell of digital doom, there are many researchers and educators who are moving ahead with the job of working out how we can make the best of the opportunities that are arising here."

Online sharing and participation are everyday activities for "Millennials," the current university student generation. Millennials have also been called the "Net Generation" and "Generation Y." Neil Howe and William Strauss, authors of the book *Millennials Rising: The Next Great Generation* (2000), identify the beginning of the generation as those born in 1982 and suggest that this demographic has a number of characteristics that sets them apart from previous generations. One shift is from the expectation that reference sources are products of a single mind to the expectation that reference sources should be produced by many, who collectively contribute to the group process. Here, we argue that the integrative and communicative settings we are developing in university teaching-learning are benefiting from these two aspects: the idea of sharing and integrative processing. Greenfield (2009) says that, although this generation may have adopted new skills, for example, impressive visual intelligence, the cost seems to be deep processing: mindful knowledge acquisition, inductive analysis, critical thinking, imagination, and reflection. We argue that these skills are essential in teacher education and that students would benefit from integrative teaching.

THE PRESENT SITUATION IN INTEGRATIVE TEACHING PRACTICES

The main purpose in questioning the present situation is not to argue with the numerous opinions or construct generalizations on the basis of this kind of knowledge, but rather to understand the pedagogical horizon of integration in current Finnish teacher education. To support our developmental work in interdisciplinary integrative teaching, teacher educators in multidisciplinary subjects in all Finnish teacher training departments (the universities of Helsinki, Oulu, Jyväskylä, Eastern

Finland, Turku, Lapland, Tampere, Kajaani, and Rauma) were asked about their practices and challenges in integrative and interactive teaching by means of an online questionnaire. The questionnaire focused on the teachers' experiences with integrative instruction, the potential and challenges in integrative teaching, as well as the teachers' visions for the future.

In 2012, we approached some two hundred teacher educators, and twenty-nine answered. The majority (65%, 19/29) were female teachers. Why such a low response rate? Possible reasons may be too little time or lack of motivation or too few experiences in integrative teaching. However, the respondents represented all possible school subjects and teacher education programs (class teacher, kindergarten teacher, and/or subject teacher education). The teacher educators who responded were quite experienced in their work; one third (31%, 9/29) had been teaching more than twenty years; almost one fourth (24%, 7/29) had taught from sixteen to twenty years; and one fifth (21%, 6/29) had taught from eleven to fifteen years. Only 10% were beginners, who had worked at most five years. The teachers' experiences tell us that, the more teaching experience a person has, the more critical is their attitude toward integrated teaching. The less-experienced teachers (five years or less) were eager to implement integration in their teaching, but were short on courage or the skills to plan and carry out integrative teaching experiments. The expertise of more experienced teachers was needed to support the novice teachers. However, these needs were not met.

Teacher Educators' Experiences in Integrative Teaching in Teacher Education

Teacher educators understand integration as a diverse and dynamic phenomenon with various pedagogical solutions, an understanding that is also in line with our conceptions of the heterogeneity of the present state of integrative teaching. The teacher educators identified integrative processes and practices as various joint events, theme days, or larger projects in cooperation with colleagues or partners outside the school. The teachers' conception of integration was that it enriches optional pedagogical solutions in teaching and leads to re-organization of the content to be learned. Some of them believed that, at its best, integration creates new ideas and ways of thinking and supports varied ways of sharing and working together. For example:

> New traditions were born during the school year. Different kinds of students worked together, solved problems, which are not usually faced in normal teaching. The teachers' collaboration was meaningful. The parents and other guests were involved successfully. (Teacher Educator 16)

> . . . [the integration] created experiences of success, new ways of looking at familiar things, and in that way it created motivation, to have the courage to think differently. (Teacher Educator 12)

Some of the teachers' observations were more critical; they pointed out the problems faced in short-term interventions and the change in their own practice.

> Bad experiences. [Integration] messes up understanding of subject-based concepts and wholes, which is already at a low level among student class teachers. (Teacher Educator 23)

> Integration is laborious, and it requires a lot of readiness to think in a new way. Rewarding. Anyhow, a single time is not enough, but interventions should be realized several times and [should be] developed further. (Teacher Educator 11)

These answers reveal that sometimes there is a lack of patience to go deep enough into the integrative practice. Even though the first time may not be a great success, the continuity may offer deeper understanding.

The Potential and the Challenges of Integration

The teachers' experiences revealed their understanding of what is essential in being a teacher. The teacher is required to master a range of skills; for example:

> [By integrating] we could create a strong core for a teacher, surrounded by special features of different subject areas. What is central is that there could be things to learn that are common to every teacher, such as skills in interaction, emotional skills, and pedagogical content, such as ethics, morals, psychology, motivation and so on …. (Teacher Educator 8)

> [The] effects [of integration] on basic education: erasing the border lines between school subjects, changing the idea of the teacher from a knowledge transmitter to a guide in constructing understanding and applying knowledge. (Teacher Educator 7)

Even though integration was seen as very rewarding, the teacher educators identified many challenges. They described difficulties in organizing and coordinating the practice. The limited resources of time and space together with the increased number of meaningful negotiations and the amount of collaborative planning seem to be complicated. Another set of challenges the teacher educators described was the risk of superficial learning outcomes. Some of them stated that integration, if implemented too early in a teacher training program, might cause difficulties in adopting basic subject-specific skills and knowledge. The basics should be thoroughly studied before implementing integrative practices. Moreover, the strong tradition of subject-based pedagogy and teachers' positions as subject teachers in teacher education were also seen as very difficult and structurally too fixed to adopt integrative practices.

The Teacher Educator in the Twenty-First Century

At the heart of integrative projects, the teacher educators identified skills in collaboration and interaction, including dealing with emotions and growth in critical

thinking. Many of them also highlighted skills in multimodal media technology. These groups of skills constructed visions of future schools in which generalist teachers would work together with specialist teachers, actively using modern multimedia and learning technologies in cooperation with the surrounding society.

> [The skills and knowledge needed today are] multidisciplinary and versatile knowledge plus collaboration skills. These days hardly anyone works alone in an office, but rather works in diverse projects together with other people, which demands collaboration skills both at the national and the international level. In addition, collaboration within the school in different instances is current, and integration between the school subjects is a possibility. (Teacher Educator 3)

> Knowledge should be more connected, for example, by using ICT and cultural themes in education. We need more partners in cooperation with society at school. (Teacher Educator 26)

> [The skills and knowledge needed today are] knowing the Finnish cultural heritage. Knowing diverse processes in different disciplines and the arts. ICT is everyone's working base/space and tool. Integration requires practice, concerning personalities and techniques. Integration means that the school is an active part of society as well. (Teacher Educator 16)

Despite all the positive integrative experiences, some of the teachers were against integrative activities; they pointed out the value of the old subject-based standards, as in the following comment:

> I think the future is not based on emphasizing, for example, the concepts of crafts, visual arts, music education, and so on in all teaching and messing up the teaching of biology and geography. The same goes for the whole range of natural science subjects in school. It is unnatural and superficial to teach them together as in the American system. (Teacher Educator 23)

DISCUSSION

In this chapter, the teacher education program at the University of Helsinki is discussed from two standpoints: one is the search for meaningful interdisciplinary integrative teaching methods that would enhance students' collaborative, associative, and creative learning; the second is the challenges and possibilities of integrative and interaction-oriented teaching methods.

According to some teacher educators in Finland, integration in education turns out to be mainly positive, and teachers have used multidimensional pedagogical solutions to carry out integration in their classrooms. The teachers pointed out reasons for unsuccessful trials at integration. There is a need to discuss further the challenges and difficulties in implementing integrative teaching before rejecting new trials. It is also important to consider longer-term integrative activities that have continuity and depth.

The teacher educators framed the possibilities in integrative teaching in light of a future-oriented concept of a teacher, based on shared expertise and skills in interaction, emotions, and collaboration. However, it appears that the practices of integrative teaching in teacher education are still more or less subject- and teacher-oriented.

Teacher educators are generally aware of the skills and readiness of their student teachers, such as how the Millennials and the younger generations use social media and how they have attitudes of sharing. This led us to consider whether there might be a gap between the objectives and the practices. The question also comes up of how the challenges of today could be answered and what kinds of methods and tools should be used to create meaningful activities for the students.

Teaching and teacher education are in a continuous state of progress, and both should respond to the challenges of the present. The views and aims of our development work for integrative and interaction-oriented teaching discussed here in the spirit of today's sharing-centered culture correspond to the objectives of the new Finnish national core curriculum for basic education, which is still being drafted (Finnish National Board of Education 2012). According to the draft for the new core curriculum, the future objective for the integration of teaching is to help students structure their own experiences of daily life and school life into meaningful wholes. The aim is also to help pupils combine skills and knowledge from various disciplines. Furthermore, the new curriculum recommends that teachers organize learning projects in which students can explore the same topics from different viewpoints and acquire experiences in participatory and creative activities.

There is a need to continue this kind of development and to implement practical teaching experiments. We are already conducting several teaching experiments in teacher education and in cooperation with primary schools.

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11. FINNISH-RUSSIAN COOPERATION IN TEACHER EDUCATION

The Joint Study Module "Teaching Foreign Languages to Young Learners"

INTRODUCTION

Thanks to globalization and the internationalization of higher education, joint international study programs are growing rapidly. The focus of this chapter is on a Finnish-Russian educational project to design, create, implement, and develop a jointly offered study module called "Teaching Foreign Languages to Young Learners," known as TeFoLa (25 ECTS). The parties involved are the School of Applied Educational Science and Teacher Education at the University of Eastern Finland (UEF, in Joensuu, Finland) and the Department of Modern Languages for Young Learners at the Herzen State Pedagogical University of Russia (HSPUR, in Saint Petersburg, Russia). This collaboration with its aim of a jointly offered program has been ongoing since 2007.

As a project with the educational goal of training students at both universities in the field of early language education, TeFoLa was both the starting point and the foundation for designing an International Master's Degree Program in Early Language Education for Intercultural Communication (ELEIC), to be launched in the academic year 2013–2014. This chapter describes the process of developing a jointly offered master's degree program and explains the various stages of development at TeFoLa from the perspectives of both the teacher trainers and the students. Our focus is on one of the most relevant issues in international education, namely, intercultural educational interaction and its main challenges.

A GLOCAL CONTEXT FOR TEACHING AND LEARNING INTERACTIONS

The process of designing a new educational program normally involves considering such issues as the program's goals, content, learning outcomes, modes of delivery, resources, assessments, and so on (issues familiar to those who deal with initiating new programs). When it is a question of a joint international program, many other issues must be taken into account.

Presumably, one of the most relevant challenges in designing and implementing international educational programs is rooted in the cultural differences of the

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participating parties. These differences are the factors that modify the social and educational context of interactions among members of the administration, the teaching staff, and the students at the universities involved, transforming the context from a local to a glocal one, an integration of locality and globality. As Altbach and Knight contend:

> [G]lobalization and internationalization are related but not the same thing. Globalization is the context of economic and academic trends that are part of the reality of the 21st century. Internationalization includes the policies and practices undertaken by academic systems and institutions … to cope with the global academic environment (Altbach & Knight 2007, 290).

In this respect, universities promoting internationalization may be described as "glocal actors" (Robertson 1995), incorporating locality into the globalization process and globality into the local context (Lobera & Escrigas 2009). Arguably, jointly offered international programs construct a new environment, a glocal context for teaching and learning interactions (Pogosian 2012). The main features of this new interaction context are the following:

– the language of interaction (in this case, English, i.e., a foreign language for those who are interacting);
– the settings of interaction (both face-to-face and web-based learning situations);
– the diversity of cultural background of the interacting participants, which turns both teaching/learning situations (student interactions and teacher-student interactions) and program management situations (administrators' interaction) into sites of intercultural communication;
– topics of interaction (which concern the internationalization of course syllabi in teachers' interactions; internationalized content of studies in students' interactions; harmonization of differences in educational processes, and arrangements in administrators' interactions).

This glocal context of joint international educational programs may be regarded both as the main challenge to designing and implementing the programs and as the main factor that adds value. For instance, students' participation in a joint international program requires certain additional skills: sufficient foreign language proficiency (usually English) to enable them to participate in the courses, and intercultural communication and cooperation skills to enable successful communication and interaction with foreign classmates and teachers.

As Kimmel and Volet (2012, 157) point out, contextual aspects of the learning environment are of great significance for students' intercultural experiences and attitudes, and "language proficiency, academic competencies, and cohort characteristics play an important role for students' intercultural encounters." Arguably, jointly offered international programs construct a new environment for educational interaction and in this respect may be regarded as an arena of experiential learning in the field of intercultural communication. These programs provide opportunities

to engage with foreign classmates and teachers in the process of intercultural communication, and they furnish experience in language practice in the activities of academic reading, writing, and discussions. Thereby, they undoubtedly increase the level of fluency in a foreign language and in intercultural communication.

It is also important for enhancing intercultural communication to deal with topics related to the professional sphere of the students. Participation in joint programs raises both student and teacher self-confidence and nurtures skills in using English for professional purposes: students gain the self-assurance to participate in and travel to other international programs, while teachers gain experience by delivering their courses in English, an advantage for those who intend to be involved in other kinds of international educational activities.

Program Participants' Cultural Background and Its Impact

The cultural background of the joint program participants, in terms of their previous educational experiences, educational traditions, and conventions at their home universities, has an impact on their educational interactions in the context of a joint program. Anderson-Levitt (2008) argues that classroom activities may vary considerably, owing to regional differences in resources, regional and local differences in pedagogical philosophy, and national and local differences in basic cultural assumptions about schooling and learning. She also points out that teachers and students bring their assumptions and ways of doing things into the classroom from broader, national cultures. As a result, even when educators believe they are teaching the same curriculum, the classroom experiences can differ dramatically.

Without doubt, the cultural background of students and teachers, insofar as their previous experience in teaching and learning is concerned, has a strong impact on what they perceive as conventional, as "normal" in relation to methods of teaching, as well as to the relations between students and teachers, students' learning activities, and personal experiences of the study content. New educational settings, new teaching styles, methods and instruction tools, and new learning activities may all influence the efficiency of both teaching and learning.

Our assumption is based on the studies by Hofstede (1986) and Hofstede, Hofstede, and Minkov (2010), who claim that there are cultural differences in teaching and learning. These differences are associated with the cultural dimensions identified by Hofstede (1986), who showed that many differences underlie values and attitudes in educational settings. These differences concern teacher-student relations, attitudes to learning and teaching, as well as approaches to teaching. Given these differences, it is possible to predict and thus take into account students' expectations, provide them with the necessary support, and ultimately, design a program for them, while bearing in mind the problems that may arise and possible solutions. At the same time, the goal of a joint program is not to change values and attitudes, but to identify possible differences, thus raising the awareness of both teachers and students who participate in the program.

Owing to the relevance of the above issues for successful cooperation in designing and offering a joint international program, we took a step-by-step approach to design and improve the educational interaction. The cooperation involved various activities:

1. annual workshops for the universities' staff members, both teachers and administrators, intended to inform them about the respective systems of education, the traditional and current approaches to training teachers, and the teaching of foreign languages to children (see e.g., Kantelinen, Sokka-Meaney, & Pogosian 2008; TeFoLa 2011);
2. jointly offered intensive programs for Finnish and Russian students (funded by CIMO, FIRST Intensive Program grants) held in Saint Petersburg for piloting and evaluating separate courses and launching a joint study module, investigating Finnish and Russian cultural differences in terms of conventional learning preferences and predispositions (see e.g., Eskelinen 2010; Kantelinen & Hacklin 2012);
3. a jointly offered study module TeFoLa and a concurrent exploration of students' and teachers' opinions of course delivery and teaching methods;
4. preparation of a jointly offered master's degree program, the Early Foreign Language Education for Intercultural Communication, to be launched in the academic year 2013–2014.

In general, our road map for creating a joint master's degree program ranged from joint workshops to an intensive course and then to a joint study module. The module, TeFoLa, has been central to the research and preparation for designing the program.

TEFOLA: A JOINT STUDY MODULE FOR *TEACHING FOREIGN LANGUAGES TO YOUNG LEARNERS*

The joint module *Teaching Foreign Languages to Young Learners* (TeFoLa), which comprises five courses (5 ECTS each), was planned through a Finnish-Russian cooperative project begun in 2007. The geographical distance between the parties involved, the University of Eastern Finland in Joensuu and the Herzen State Pedagogical University of Russia in St Petersburg, is about 420 kilometres. It takes six to seven hours to negotiate the distance by train or about six hours by bus. Active interaction has not demanded constant travelling, however. Rather the planning process has been implemented through virtual communication and some face-to-face meetings and seminars (2007 and 2009 in St Petersburg, 2008 in Joensuu; see Kantelinen, Sokka-Meaney, & Pogosian 2008) and teacher exchange (funded by CIMO, FIRST grants).

The module is intended for teacher students, class teachers, and subject teachers alike. The aim of the TeFoLa studies is that on completion of the module, the students will have gained insight into issues in early language education and will have the knowledge, skills, and competencies necessary for planning, implementing, and developing language education for young learners in pre-primary and primary

education. The module content includes the theory and practice of learning and teaching foreign languages, foreign language perspectives, multilingualism and multiculturalism, as well as lifelong language learning. These themes are reflected in the course titles: Children as Language Learners; Theory and Practice of Teaching Foreign Languages to Young Learners; European Language Portfolio for Young Learners; Research Practicum in Language Teaching and Learning; Teaching Practice (Pogosian & Kantelinen 2009).

Both for students and for teachers, the TeFoLa program promotes internationalization at home, and the module supports and develops intercultural communication competence. Given that TeFoLa is focused on training language teachers, the experience gained from practicing a foreign language and intercultural communication is even more valuable.

The five courses in the TeFoLa module were implemented for the first time during the academic year 2010–2011. The educational material and assignments were produced in cooperation between Finnish and Russian teacher educators, with the University of Eastern Finland administering a Moodle (an e-learning software platform) for each course. Two persons were appointed to be in charge of each course: one from Finland and one from Russia. They were responsible for planning the teaching in the study module and implementing it at the general level. Other teachers from both institutions were also involved in planning and implementing the teaching in individual courses and thereby took part in developing the module. The technology of module delivery involved face-to-face classes at both universities supported by intensive web-based teachers' and students' interaction and involved students' doing assignments in small international groups and discussions held both offline and online.

The TeFoLa module is offered as an optional minor subject for class teacher and subject teacher students in UEF's Philosophical Faculty. In HSPUR, it is a compulsory module in the graduate programs (the master's level) called "Teaching Foreign Languages to Young Learners for Intercultural Communication" and "Intensive Training of Children in Foreign Languages."

Differences in the higher education systems in the two countries account for the differing status of the module in the partner universities. In Russia, students enrolled in an educational program are actually enrolled in an academic group, a permanent cohort that has classes based on a certain timetable (almost identical to primary and secondary school practice). This timetable does include some sessions allocated for so-called elective courses, but these courses are pre-determined, their number is very limited (usually no more than two are offered), and the time for contact classes is set by the timetable. As a result, the Russian timetable of contact teaching classes is fixed for the whole "academic group" of students and also puts a limit on the number of classes taught per week (14 for graduate programs). The number of hours required for one semester of study is stipulated, as is the number of credits. These strict requirements mean that unless TeFoLa courses are embedded in the curriculum as compulsory courses, it would be impossible for Russian students to add the 25

credits from the TeFoLa module in a single academic year. By contrast, at UEF, students themselves make the decision whether to take TeFoLa studies and include them in their master's degree as a minor subject. As a result, in order to adjust the joint module to the different educational systems, the decision was taken to assign a different status to the module in the partner universities – a minor studies module at UEF and a compulsory module embedded in the graduate studies curriculum at HSPUR. Further research and TeFoLa implementation showed that this is not the only issue that needs adjustment in the area of joint international program management.

TEACHER EDUCATORS FIND TEFOLA COLLABORATION CHALLENGING BUT REWARDING

A SWOT analysis was conducted after the five TeFoLa courses were first offered in the academic year 2010–2011. The objective was to examine in detail all aspects of the Finnish-Russian collaboration from the involved educators' perspective and identify the relevant factors in terms of the module's internal strengths and weaknesses as well as its external opportunities and threats. The overall goal was to enable support for mutual cooperation.

The SWOT templates were filled out by Finnish and Russian educators in the spring of 2011. The data were analyzed by means of content analysis (Cohen, Manion, & Morrison 2007) and principles of SWOT analysis (Pahl & Richter 2007).

According to the Finnish team of educators, the strengths of this cooperation have been in sharing expertise, learning from each other, internationalization, and having talented and motivated students (Kantelinen & Pollari 2012, 88–89). Russian educators pointed out the same strengths, emphasizing the international perspective both for teachers and for students, since through this cooperation all gain experience in international professional cooperation and knowledge of other cultures.

In the opinion of the Russian educators, another strength of TeFoLa was the joint working atmosphere in which the Finnish colleagues and the members of the whole international team were sincere, friendly, highly-motivated, creative and supportive, and eager to obtain meaningful results. At the same time, the Finnish teachers pointed out a weakness in the cooperation related to communication with their Russian partners, particularly in the different ways of working (planning, timing).

As for other internal weaknesses in the cooperation, the Finnish educators emphasized some of the study arrangements (e.g., too few hours for contact teaching), and difficulties related to the students' orientation to independent web-based activities (Kantelinen & Pollari 2012, 88–89). These views partly coincide with the views of most Russian educators, who also pointed out the weaknesses of insufficient Russian and Finnish students' interaction and the differences in the academic processes at both universities (the time when semesters start and end). The latter, in terms of "differences in administrative practices," was cited by the Finnish teachers as one of the threats to the joint program (Kantelinen & Pollari 2012, 88–89).

As for external opportunities for TeFoLa cooperation, the Finnish educators saw the significance of further research cooperation. The Russian educators saw external opportunities in offering short-term courses related to TeFoLa (e.g., summer school courses) and in extending the module to the master's degree program. They also pointed out the opportunities for enhancing students' interactions through video-conferencing, webinars, blogs, and so on.

For both partners, other external opportunities, such as seeking external resources (human resources, funding, projects), are connected with the external threats, which are identified as lack of resources (time, funding, ICT support) (Kantelinen & Pollari 2012, 88–89).

TEFOLA STUDENTS DESIRE INTERCULTURAL INTERACTION

Students' Learning Predispositions and Motivation

One of the TeFoLa courses, the Theory and Practice of Teaching Foreign Languages to Young Learners, was piloted during the spring term of 2010. Ten Finnish and ten Russian class teacher students completed the course. The course was started in a Moodle virtual learning environment and with the support of a CIMO, FIRST Intensive Program grant, the contact studies were implemented at Herzen State Pedagogical University of Russia, during the week of April 11–18, 2010 (Eskelinen 2010).

Centered on one of the courses in the joint study module, the Intensive Program provided an opportunity for the teaching staff to share their expertise and acquire experience in team teaching and joint course delivery, which in turn facilitated and promoted collaborative efforts in designing and developing the joint study program. It also provided the opportunity to conduct a small-scale research project on Finnish and Russian university students' learning predispositions and their motivation to participate in the joint study program.

The analysis of the questionnaires given to the students after the Intensive Program revealed that there were no big differences between Finnish and Russian students' preferences in terms of learning activities. The best-liked learning activities for both student groups were face-to-face discussions and project work. Reading, writing, and web-based work in Moodle were the most often disliked learning activities, with both the Finnish and the Russian students expressing a preference for face-to-face activities and acknowledgment of problems with the use of technologies.

There were also no differences between the Finnish and the Russian students' reasons for enrolling in the course. Interest in early language education and a desire for authentic intercultural experiences had attracted the students to this kind of course implementation. The students also expressed interest in communicating with foreign students and learning from each other (how students and children are taught foreign languages in the respective countries), and some wanted to improve their English-language skills. Based on the common elements in the educational background of

the Finnish and the Russian students (all of whom were teacher students), it can be assumed that the commonalities are linked to their professional aspirations. The students were looking for useful learning experiences for their future professions as teachers.

The Students' Experiences

At the end of the first year of TeFoLa implementation, the early summer of 2011, the Finnish and Russian students were asked to fill out questionnaires, which they submitted electronically. The students were asked to share their opinions on TeFoLa's strengths and weaknesses, to give specific feedback on each course, and to describe their general views and experiences so that these could be used to improve the module. Presumably, this kind of student feedback can serve as a basis for improving the program.

The students' responses in both the Finnish and the Russian cohorts coincided. All found the module useful and well-organized. They pointed out as its strengths the opportunities it provided to work in small international groups, to obtain a multicultural view of educational problems, to share experiences in an intercultural community, to gain positive experience in teaching English to children, in conducting joint small-scale research, and in getting different points of view from students from another country.

The TeFoLa students as well as the teachers identified the general weakness of the program as being too little collaboration between the Finnish and Russian students. The students also gave feedback on specific courses with critical remarks on course syllabi, course content, and arrangement. In the students' view, some courses had too much theory, some had too many assignments, and some had too few contact hours and discussions.

Although the views of the Finnish and Russian students were remarkably similar in terms of TeFoLa strengths and weaknesses, the one difference in their opinions concerned the use of English in the classroom. The Finnish students complained about using English during their classes with Finnish teachers (in a group in which all the students spoke Finnish as their native language), while the Russian students found the extensive use of English in TeFoLa courses a great advantage (even in contexts in which everyone shared Russian as their native language) and an opportunity to practice. At the same time, it should be pointed out that further implementation of TeFoLa attracted a number of foreign students to the University of Eastern Finland, which made it necessary to use English, not only in Finnish-Russian educational interactions, but also in face-to-face classroom interactions in Finland.

Based on the experiences and the feedback on TeFoLa so far, Russian and Finnish students seem to have had more in common than differences in their preferences for learning activities and forms of learning. These findings are of value for further developing and implementing the TeFoLa module. As long as the TeFoLa delivery method is based on face-to-face and web-based assignments, meaning chiefly

writing tasks, it is obvious that both Finnish and Russian students will need some support to carry out these assignments in a foreign language.

The project work appears to require teachers' special attention as well. TeFoLa projects are supposed to be conducted in Finnish and Russian, even in international educational contexts; in other words, they are to be discussed, implemented, and reported on by international student teams. Thus, student cooperation needs to be supported, not only in order to overcome the concrete challenges of interaction, but also to enhance the intercultural competence of the students.

DISCUSSION

The SWOT analysis of educators' views and the analysis of students' feedback identified further steps to be taken by the module organizers to ensure the sustainability of the program and aspects of its implementation needing special attention. Although preliminary research revealed basic commonalities in the students' dispositions for learning activities, further research showed that the students need more support and guidance to ensure their independent web-based work. Based on the research findings, many alterations were made to the module's course syllabi and their implementation during the academic year 2011–2012. Most of these involved enhancing student interaction by giving more assignments to be carried out in international teams, through more videoconferencing and more web-based discussions, and by opening the courses to international exchange students at UEF in order to give the Finnish students a reason to use the English language throughout the studies.

Interaction among all the module stakeholders turned out to be one of the pivotal aspects of the module's implementation:

– the students pointed out the need to enhance interaction with their international peers, emphasizing its relevance in providing them opportunities for gaining a multicultural view of educational issues;
– the educators, while acknowledging the warm and friendly atmosphere of their professional interactions with their colleagues, still pointed out the deficiencies in solving everyday problems in joint teaching;
– both the students' and the educators' feedback demonstrated that all of them need more institutional support from university administrators in order to bridge the differences in academic processes in two different countries and to provide external resources to support the program in general.

Overall, the research-based path of the step-by-step development and implementation of the Finnish-Russian cooperation in the field of joint teacher education has proved to be useful for identifying weak points, introducing improvements, and moving forward to create a sustainable, jointly offered master's degree program.

We find it to be a strength of this cooperation that it is not only a cross-border attempt to satisfy the current indicators of quality in higher education, but it also

serves a real need for a particular kind of educational interaction; both partners benefit from each other's expertise, learning from each other and learning together – at the level of individuals and at the institutional level. As coordinators, we have built mutual trust in each others' sincere efforts to make the interaction and cooperation work, even in situations in which cultural differences in laws, norms, educational approaches, practices, and more seem to make the interaction and cooperation all too complicated, if not impossible. Such confidence is an extremely important and empowering factor for this challenging, yet rewarding professional interaction in the field of teacher education.

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12. MUSIC FOR ALL FOR MUSIC

A Study of the Resonaari Concert Audience and Equalized Interaction

INTRODUCTION

There is a growing interest in music education that focuses on students with Special Educational Needs (SEN). This is partly the result of various concerts, video clips, documentaries, and other publications that have popularized recent progress in the field. With regard to Finland, the most familiar examples are the prize-winning documentary film *The Punk Syndrome* (2012), the feature film *Gimme Some Respect* (2011), the acclaimed pedagogical handbook and DVD *Music for All!* (2011), and the concert DVD, *Resonaari soi 2010* (2010).

It appears that this positive following, which the developments in special musical education have attracted, is not purely pedagogical. Besides the individual progress of students with SEN, which can be seen and heard in musical performances, something else engages human nature: the interaction between diverse members of society and the potential for equalization that special music education awakens.

Among the best-known Finnish achievements in this area is the work of the Special Music Centre Resonaari (Helsinki). Resonaari (as the name is often abbreviated) is an internationally acknowledged developer and promoter of special music education. The Centre's foremost aim is to guarantee that people with SEN have opportunities to participate in goal-oriented and professional music education. Resonaari's results have been demonstrated successfully in sold-out concerts in the Savoy Theatre in Helsinki, for example.

In this chapter, we report on our study of the audience attending Resonaari's concert called "Resonaari soi" ("Resonaari sounds") on May 14, 2012. Our research is based on an online survey (in the authors' possession), which we sent to members of the audience after the event. In addition to giving the results of this survey, we discuss in detail the entire performance that evening and provide examples of the interactions that took place. For this data, we rely not only on respondents' reactions to the open-ended questions on the survey, but also on our own observations, as well as on the video documentation of this musical occasion (in Resonaari's possession).

Our aim is to demonstrate some of the advances in special music education and how these can promote inclusion and equalization. We focus on one event (i.e., a concert), which included multiple levels of basic human interaction. With this focus,

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Figure 1. Resonaari students performing at the Savoy, May 14, 2012. (Elomaa 2012).

we can formalize views on how music as an art form and a field of pedagogy can liberate, unite, and educate society in captivating ways.

First, we will briefly introduce some essential aspects of Resonaari and its related concert history. Next, we explain our research process and materials. Then we discuss and demonstrate five different levels of interaction that we were able to identify in this particular concert (in two sections). Finally, we present three key points that emerged from our online survey. We close with a summary of views on the phenomenal potential of special music education.

RESONAARI AND THE ANNUAL SAVOY CONCERTS

Special Music Centre Resonaari was founded in 1995 in Helsinki. The Centre completed its first special music education curriculum in 2000. In 2004, the city of Helsinki granted the Centre permission to give formal music education and to receive public financial support for this. The Resonaari organization, its pedagogy, and its outstanding results have been discussed in dozens of academic studies, from the bachelor's level to the doctoral level. In addition to being a music school, the Centre offers continuing education for professionals and maintains contacts with specialists who are working in the field. For detailed information on Resonaari and its achievements, see, for example, Kaikkonen (2008) and the Centre's webpage, www.resonaari.fi.

More than 200 students from all age groups are enrolled in Resonaari. Approximately 80 of these students perform in the Centre's annual concerts held in the Savoy Theatre in Helsinki, a celebrated part of Resonaari's public events. Most of the ensembles among the performers are made up of learners with some developmental or intellectual disability (or both). Other ensembles are comprised of students with autism spectrum or psychiatric disorders and physical disabilities. The first Savoy concert was organized in 2005. The performance held on May 14, 2012, was thus the eighth in succession.

Right from the beginning, Resonaari's Savoy concerts were a triumph: the more than 700 seats in the theatre typically sell out days in advance. According to Resonaari, in the beginning, the audiences were made up of people who had close personal connections to the students with SEN, comprised mostly of the performers' relatives and friends. Recently, the concert audience has become more heterogeneous. Increasingly, the event appears to attract listeners without any personal relationship to the performers. This change in the composition of the audience is one of the chief factors that has motivated our research.

INTERACTION DURING RESONAARI'S CONCERT

The latest "Resonaari soi" concert was a fascinating demonstration of musical and music-related interaction. Thanks to the video made during the concert, we (Poutiainen, Kivijärvi, and Kaikkonen) were able to study these interactions in some detail. We also relied in part on our observations of the event. We authors deliberately sat in different places in the auditorium so that we could study the audience and its reactions during the concert.

By interaction, we mean here mutual actions, effects, exchanges, or influence that appeared between two or more parties (e.g., between the performers and the audience). In this study, interaction is defined as an interpersonal sharing of information, meanings, opinions, interests, and feelings in which the participants are actively involved as both senders and receivers (see Fogel 1993; Kontu 2006). The interaction may be visual, auditory, or kinesthetic (i.e., vocal or facial expressions, eye contact, movements, positions, postures, and so on). Interaction refers to the continuous, co-regulated change of verbal or nonverbal gestures and the responses to these (see Elias 1991; Stacey 2003). With regard to "Resonaari soi," we discuss five different levels of interaction, beginning with the audience-related interaction (two levels) and concluding with interactions that took place on the stage (three levels). We illustrate the discussion with descriptions of illuminating moments in the concert.

Audience-Related Interaction

The first level of interaction that we noticed took place between the audience and performers. This level is relatively essential in almost any live musical performance. In "Resonaari soi," the musical communication from the stage (i.e., performers playing

and singing to the audience) was supported by lively verbal introductions to the pieces given by two professional moderators. The audience frequently acknowledged the performances with warm applause and cheers. It was easy to see that, in this concert, there were no borders between the performers and the audience. The interaction between the stage and the audience – in both directions – was direct and unchallenged.

For example, after the performance by Class Beat, the two hosts acknowledged the outstanding skills of the lead singer (a student with SEN) and praised her as a very talented young musician. The audience responded with loud applause. The student smiled with some bafflement when the hosts commended her abilities further. The applause seemed to go on and on. (Resonaari soi 2012, time indices 56'20''–57'00'')

Special needs often bring additional challenges to interactions. Developmental disabilities or sensory impairments, for instance, can create difficulties in perceiving. A student's worldview may be quite chaotic or inflexible, and the requirements in different circumstances are too complicated to find, organize, or fulfill (Kontu & Pirttimaa 2008). With students who have developmental disabilities, unusual, challenging, or disruptive behaviors may be characteristic (see American Association on Intellectual and Developmental Disabilities 2013). The Resonaari students, however, were able to manage in the complicated circumstances of the performance act, and even more, they were able to regulate any uncomfortable emotions, as well as interact and perform admirably.

There were some minor technical problems; for instance, at the beginning of almost every performance, there were issues such as the sounds were not right or the voices were not sufficiently amplified. However, the students behaved very professionally. In any problematic situation, they waited patiently until the teachers solved the problems. Often the singers immediately thanked the audience for their patience. The lead singer of the group Ruuvit löysällä especially provoked some good-humored laughter and encouraging applause from the listeners. (Resonaari soi 2012, 29'00''–34'30'') Afterwards, the performance began in relaxed fashion. There were no signs of confusion or tension.

We identified a second level of interaction between different groups in the audience. Our interest lies in two main groups, namely, the audience members with disabilities and those audience members without disabilities. An interaction between these particular groups is rare on the regular concert scene today. In a "Resonaari soi" concert, some in the audience had disabilities, which ranged from major to minor. It was interesting to see how these members of the audience constantly communicated with audience members who had no disabilities or SEN. Evidently, this heterogeneous setting increased the feeling of inclusion and unity, as our survey report below suggests.

Interaction on the Stage

In Resonaari's Savoy Theatre concerts, professional musicians without disabilities frequently play or sing with the Resonaari students. The role of the professionals,

however, is mainly supportive: they are not responsible for any of the significant aspects of accompanying, solo work, or singing. Thus, the third level of interaction appeared between the performers, those with disabilities and those without. From our point of view, there were no challenges in this particular interaction. The musical interactions among all the performers were effortless and successful. In this respect, it was easy to see just how much potential music as an art form possesses. It is a unifying "language." In other words, music can appear to be common ground, a channel, or an instrument that provides relatively equal settings for interaction between people with diverse backgrounds and skills.

During the performance, the Resonaari students and the professional musicians naturally sought support from each other, since they had to agree, for example, on timings, beginnings, and endings of the musical pieces and also signal these things. Through eye contact and hand gestures, the performers ensured that all these changes were accomplished at the right time.

The students and the professional musicians often had overlapping notions during the performance. For instance, in the middle of a performance by Tähtien sota, the audience suddenly began to applaud and sing along. The lead singer (a Resonaari student) and the professional musicians (without disabilities) responsible for the back-up vocal parts acknowledged this nice surprise by exchanging smiles. (Resonaari soi 2012, 1'28'50''–1'31'30'')

The fourth level of interaction appeared between performers with SEN. This level of interaction did not seem to differ in any way from the interaction just described between the performers as a whole. As for each performer's level of skill, the communication seemed to be smooth and easy. It looked as if all of the performers were enjoying the presentation. There was no tension evident on stage. For example, the lead singer and the guitarist for Ruuvit löysällä performed several vocal parts together. During the group's performance, these two musicians frequently communicated by means of facial expressions: the guitarist cued the section changes in the piece using eye contact, smiles, and nods. (Resonaari soi 2012, 29'00''–34'30'')

Creating or learning to create interaction is also of utmost importance for the students' musical development. As the above examples demonstrate, eye contact and smiles not only contributed to the general atmosphere, but they were also an essential part of the musical interaction.

In the middle of the performance by the hip hop group Resisposse, one of the rappers was "freestyling" (i.e., improvising rap), while the other members of the group listened in the background. The latter encouraged the soloist with smiles, typical hip-hop hand gestures, and frequent "high fives". Simultaneously, some of them took a step toward the percussionist to remind him when to start playing. Everything went off smoothly. (Resonaari soi 2012, 1'55'20''–2'00'')

The fifth level of interaction appeared between students with SEN and their teachers. The students were allowed, indeed, were expected to take full personal responsibility for their performances. However, teachers were on the stage for

support in the event of something happening. Usually, the teachers' help was not needed except in setting up and turning on the equipment. The students could predict when they would need assistance and signaled for help by asking or simply making eye contact. Sometimes students dropped out of a performance. When this happened, the teachers subtly, but effectively brought the members back into the performance. While one teacher supported a student individually, another would guide the entire group if necessary. All support was systematic and coordinated, but also dynamic and intuitive. This support could hardly be noticed from the audience.

During the performance by the group Marraskuu, the teacher gave the students support and feedback, both verbally and with gestures (e.g., eye contact, smiling, touching, and turning thumbs up). The teacher frequently used a combination of hand gestures, facial expression, and movement. For instance, he efficiently supported the drummer in anticipating a song's refrain by making eye contact and taking a step towards the drummer. Simultaneously, he smiled and waved his hand. (Resonaari soi 2012, 18'25''–22'25'')

The teachers were constantly carrying out several tasks at the same time. For example, one teacher supported the guitarists, drummer, and bass player, while another followed the keyboard players and the lead singer. When the latter was supporting the lead singer by singing along, he was also simultaneously fixing small equipment problems. If a keyboard player dropped out, this teacher quickly pointed out the right keys or whispered the related (note) colors (explained below). The verbal instructions were very quietly given and not audible to the audience. (See, for example, Resonaari soi 2012, 1'29'00''–1'32'15'') The application of note colors refers to "Figurenotes©," a sophisticated approach to notation that is employed in Resonaari. This remarkable pedagogical tool was developed by Kaarlo Uusitalo, a music therapist and educator, and Markku Kaikkonen, a music educator. The approach relies on colors and figures to indicate pitch levels and the keys or frets of an instrument.

CONCERT EXPERIENCES

In order to gain some knowledge of the concert experiences, we asked 350 of the Resonaari concert participants to answer an online survey. We received a total of 32 replies. With regard to the potential information in this audience for a sold-out concert, the number of replies was small. However, within those 32 replies, we gained a considerable amount of data in the form of typed-in personal reflections on six open-ended questions. These texts were often surprisingly detailed and extensive, and we could refer to them.

Regarding the online survey, we can make three key points. These reveal how the "Resonaari soi" concert *promoted equality*, *increased unity and compassion*, and *passed on information.*

Promoting Equality

First, the survey suggests that concerts performed by students with SEN can be musically rewarding and that Resonaari's particular concert format effectively promotes musical equality. The Resonaari students took full responsibility for the musical tasks and their performances: their teachers did not play for them. According to the survey responses, the concert performances appeared to be exceptionally accurate and expressive and engaged the members of the audience to redefine such terms as "professional musician," "musical talent," "professional performance," and "disability." It also appeared that the accuracy and expressiveness of the so-called professional musicians could be questioned. The following samples of textual reflections illustrate:

> In my opinion, all questions relating to technical competence are strange. A technical-virtuosity-based comparison of musicianship is irrelevant: I think the most important aspects are artistic quality, stylistic consistency, and a good groove. A musician can be technically successful even if he or she plays, for example, with just one finger, within the limits of his or her learning.
>
> The stars [i.e., the professional musicians who performed in the concert] were overshadowed by Resonaari's students, in my opinion. I preferred listening to them [i.e., the students].
>
> So many people could learn from things [i.e., events] like this. Professional musicians, for example, should attend such concerts and study a little bit about what is really important in music. This concert includes a lot of good examples.

Most of the reflections expressed similar sentiments. Not a single response criticized the musical quality of the concert, but rather acknowledged its exceptional character. The respondents' views of musicianship were highly diverse. They clearly celebrated the progress and the enthusiasm of students with SEN over technical skills and accuracy of musical performance: "Zest and will are among the most important things in music," one respondent summarized.

Unity and Compassion

Many of the respondents found the concert emotionally gratifying. The performers and the audience shared a feeling of extraordinary unity; hence, compassion and understanding of human diversity were experienced together and in a positive manner. The following three reflections outline this effectively:

> [This concert conveyed a] great feeling and [it was] the best proof of the vigor that everyone carries and of human rights!
>
> Right from the beginning, both the performers and the audience were involved [in this event] in a unique way. [There was] a very different atmosphere if compared with other concerts.

> This concert was unbelievable! It woke up lots of emotions in me: I cried and laughed. It was an extremely positive and touching experience!

This concert experience was clearly different from an "ordinary" one: several respondents hinted at or directly stated that they were moved or touched by the performances. None, however, felt that these emotions made the concert challenging or heavy. On the contrary, all of these feelings were seen in a positive light. One respondent wished to underline that "[o]thers' [i.e., the performers with SEN] success was so delightful. [I could see] real people performing."

Passing on Information

Third, regarding comprehensive inclusion, this concert and Resonaari's other concerts can be seen as an efficient way to convey information about diverse learners. Our study proposes that performing strengthened Resonaari students' self-efficacy, self-esteem, and self-security. The survey responses frequently implied that concerts like the one we experienced increase awareness of empowerment and educational equality, for example. One respondent concluded that concerts should be organized more often "so that people's consciousness would increase, and more people could understand the uniqueness and talent of people with SEN." All responses to the open-ended question on the social importance of the "Resonaari soi" concert expressed similar views. Six examples are the following:

> The experiences of success and public performing are highly important for the self-esteem of the student with SEN.

> The students with developmental disabilities performed surprisingly well in the exciting concert situation. Everyone knew their own position and task, and they were able to work within the group.

> Everyone can play and sing if he or she wants to.

> The audience has the opportunity to see how talented the students with SEN can be – much more gifted than so-called ordinary people.

> It would be great if different learners would perform more frequently and be an active part of the cultural scene.

> It [the concert] strengthens the performers' self-esteem, and as a result they become more capable of affecting their social status themselves.

In this respect, our survey showed that the audience could apparently recognize huge potential in special music education. They connected this pedagogical work and performance to increased inclusion and equalization in society. For those who took part in the "Resonaari soi" concert, the evening was not only about music, but also about learning about humanity. All agreed that the message should be shared and spread: "This way larger audiences would become informed and become part of 'being different.'"

Figure 2. "Everyone can play and sing if he or she wants to." (Elomaa 2012).

DISCUSSION

The "Resonaari soi" concert implies successful interaction, which shows that music (as an art form) should be taken more seriously when different parts of a society wish to meet and communicate. It could be that Resonaari's concerts are close to a set of ideal circumstances: perhaps the desired, open-minded interaction, and social cohesion are possible only in concerts like this. The concert concept could thus represent a "model" of an inclusive society.

The "Resonaari soi" concert reveals that this type of musical activity can be an outstanding way to promote equality in society. Lubet, for example, argues that music learning, making, and experiencing can encourage mutual caring and striving towards a more stable society (Lubet 2009). The far-reaching effects of a concert experience clearly reflect the emotion-laden encounter that the Helsinki audience had with disability (see Shakespeare 2005): At best, the "Resonaari soi" audience recognized the potential and the opportunities for marginalized groups in music education. At the same time, the audience could themselves acknowledge how the knowledge and skills acquired allow students with SEN to take an active part in society.

Performances by students with SEN signify inclusion in a beautiful and artistic way. The "Resonaari soi" concerts appear to be an exemplary arrangement, one that is simultaneously enlightening and entertaining. Since these values rarely meet on the contemporary music scene, this concert concept feels very refreshing.

The concert demonstrated the exceptional potential and quality that can be found in Resonaari's pedagogical contribution. According to Adamek and Darrow (2005), what is significant first and foremost is to maintain sensitivity in pedagogical interaction. Through this sensitivity, teachers can subtly support, for example, the independence of students with SEN (Adamek & Darrow 2005). Resonaari's pedagogical approach was acknowledged by the audience. One of our survey's respondents elaborated on this particular point by writing, "[i]t is interesting to follow how the teachers support the musicians in their performances. The students [i.e., the musicians] receive the support they need, but still maintain all their independence."

Resonaari's concert was a truly fascinating example of a performance concept that simultaneously educates and unites society. It is an ideal, inclusive forum in which music is *about*, *by*, and *for everyone*.

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