Doing interdisciplinarity in teacher education. Resources for learning through writing in two educational programmes

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ABSTRACT

With a focus on resources for learning through writing, this paper compares the interdisciplinary framings of two teacher education programmes. What are the implications of these framings and resources for students’ possibilities when they write independent projects/bachelor theses? The paper presents a case study with data (interviews, texts, observations) from two different teacher education programmes. The conceptual framework stems from the Academic Literacies approach. The analysis shows that one of the programmes shapes interdisciplinarity by a “block approach” that allows students to work independently, while the other is shaped as a “bridging approach” with tight collaboration between students and tutors. The two educational programmes apply the same national regulating documents in different ways, thus creating different possibilities for students to learn and write as “independent” or “collaborative” students, respectively. The results contribute to a discussion of higher education structure and the role of writing within it.

KEYWORDS

academic writing; academic literacies; teacher education; organisation of higher education; interdisciplinarity; independent projects

Introduction

This article takes as its starting point the fact that teacher education and the teaching profession have disciplinary diversity in their construction, which means that student teachers often move between disciplines and departments on their educational pathways. Furthermore, one of the challenges of teacher education is that the organisation of disciplines in higher education often differs from the organisation of subjects in primary and secondary school. An example is social studies, a school subject covering sociology, political science, economics, human geography, etc. (see below). Therefore, the educational programmes in teacher education often need to be interdisciplinarily organised in order to meet teachers’ future professional requirements. How programmes are organised is also influenced by general regulations for higher education. In Sweden, although nationally governed by the same regulations (SFS 1993:100), universities have extensive freedom in how to put these regulations into practice (cf. Exley & Singh, 2011). How may these different ways of putting national regulations into...
practice and designing interdisciplinary study programmes influence resources for learning through writing for students? This issue is the focus of this article.

We define the concept of *interdisciplinarity* as “involving or drawing on two or more branches of knowledge” (Cambridge Dictionary). There is an ongoing discussion on the concept and its relation to, e.g., *multidisciplinarity*, where the latter often refers more to an integration of different disciplines, and interdisciplinarity is the broader concept, which includes different ways of combining disciplines (Lattuca, 2003; Moran, 2010). Thus, we prefer interdisciplinarity, as our ambition is to study the combination of different disciplines inductively, posing an open question to our data on how the combination is performed. Our understanding of disciplines is also connected to Becher and Trowler’s (2001) notion of “tribes”, i.e. academic cultures that build their own traditions, knowledge and social relations (see below).

There are three main areas of previous research on academic writing that hold particular importance for our approach. Firstly, research on writing in relation to interdisciplinarity has mainly focussed on how interdisciplinarity is visible in texts (Samraj & Swales, 2000; Prior, 1997) or how it is handled by individual students (Lea & Street, 1998; Russel & Nunez, 2003). The ways universities and educators arrange and organise the different disciplines in order for students to learn has garnered much less interest. Secondly, a vast amount of research in the field covers education in the Anglo-Saxon or at least English-speaking world. Hence, many of the conditions for higher education are taken for granted and not compared to those of other countries. Thirdly, the scope of interest has infrequently covered the connection between school subjects, university education, and professional life as a school teacher. Although some scholars have taken this into account (e.g. Macken-Horarik et al., 2006; Lillis & Scott, 2007), the aspect of interdisciplinarity has not often been relevant to these studies. Hence, the aim of this study is to contribute knowledge that could provide a base for reflection and pedagogical choices in interdisciplinary settings by analysing interdisciplinarity and writing in teacher education. In this endeavour, we turn to two different teacher education programmes at two Swedish universities to investigate how interdisciplinarity can be organised in teacher education and how it might influence student teachers’ resources for learning through writing. Our research questions are:

- How is interdisciplinarity arranged in two different settings of teacher education in Sweden?
- In different interdisciplinary settings, which resources for learning through writing are provided for and used by student teachers in their work on independent projects?

**Teacher education in Sweden**

The organisation of teacher education has been a serious topic for discussion (cf. Labaree, 2004; Cochran-Smith et al., 2008; Öberg Tuleus, 2008; Ziechner, 2008), regarding, for example, the position of teacher education in academia and its relationship to practice in schools, and the framework and curricula for teacher education (Ziecher & Conklin, 2008). Teacher education in Sweden has been reorganised on
several occasions in recent decades (Bill 1991/92:75, 1999/2000:135, 2009/2010:89). The latest regulation states that teacher education is regarded as an academic professional program (SOU 200: 109) with a joint core of educational studies and practical school-based training. Apart from this, each educational programme focusses on specific subjects and didactics.

The subjects in teacher education relate to subjects taught in primary and secondary schools, such as Swedish, social science and mathematics. Subjects such as these are specified in national regulations such as the Higher Education Ordinance (SFS, 1993:100). Didactics is a commonly used concept in Swedish teacher education, meaning – in the Nordic and German sense – perspectives on teaching, including such aspects as what to teach, how to teach, who to teach and why teach (cf. Uljens, 1997; Hoppman, 2007), partly relating to the curriculum tradition in the U.S. Didactics is further divided into general didactics (teaching in general) and subject didactics (teaching in a specific subject) (cf. Ongstad, 1999, 2005).

In teacher education for primary and secondary school, students write “an independent project (degree project) for at least 30 credits or two such projects for at least 15 credits in one or two of the subjects studied during the program” (SFS, 1993:100, Annex 2). This is not a new phenomenon, although the framing of these independent projects has changed over time. In the early 1990s, higher education reform led to an introduction of independent projects in teacher education. Since then, the independent project has gained an increasingly central position in teacher education (Erixon Arreman & Erixon, 2015; Råde, 2016). The aims and forms of the independent projects in teacher education have, however, been a contentious issue, in terms of different approaches to the project (see Bergqvist [2000] and Råde [2016] for examples based on different professional and/or academic perspectives). In relation to this research field, our study contributes to knowledge of how national regulations can be enacted in different ways at the local level.

Writing and disciplinary communities

That different types of writing are related to different academic disciplines is a thoroughly studied fact. Research agrees that this fact, in turn, is connected to the different types of knowledge and ways of constructing new knowledge that characterise different disciplines (Myers, 1990; Bazerman, 1988; MacDonald, 1994; Hyland, 2004). Many scholars also agree that social factors within disciplinary communities have a great impact on writing (Prior, 1998; Swales, 1998; Jones, Turner & Street, 1999; Ivanič et al., 2009; Lillis & Curry, 2010). For instance, to what extent certain aspects of a discipline are collectively shared can have a significant influence on the type of writing (see Swales, 1990; MacDonald, 1994). The degree of collectivity may, or may not, have a connection to the actual collaboration that is done by project teams. At least, it has been confirmed that natural scientists work and write in teams more often than other researchers do (Becher & Trowler, 2001).

Many studies have been conducted on how students’ writing relates to different disciplines during their education (Freedman, 1987; Berkenkotter & Huckin, 1995; Prior, 1998; Ivanič, 1998). As mentioned above, very few of these touch upon students meeting several disciplinary and/or professional requirements.
Organisational aspects of disciplinarity have been addressed by research on academic writing, including Swales (1998), with regard to how several departments in the same building work with texts within their different disciplinary communities. Tusting and Barton (2016) point out how the conditions for writing and publishing have changed since the new managerial practice in the UK higher education system. Although none of these studies regard disciplines as clear-cut entities, neither do they focus on interdisciplinarity.

From Kuhn (1962) onwards, we have known that the system of disciplines is not stable, but rather, they merge and develop over time. Emerging disciplines can be regarded as interdisciplinary and have been covered in writing research: for instance, Samraj and Swales (2000) on environmental studies; Prior (1997) on American studies; and Räisänen (1998) on crash-safety engineering. There has also been some research on teaching academic writing for students from different disciplines, as well as on how student learning can be stimulated by interdisciplinary approaches (Kuteeva & Negretti, 2016; Haynes, 1996, Wittek et al., 2015). Neither the studies on emerging disciplines nor on pedagogical solutions, however, cover the type of interdisciplinary setting that is the focus here. There are, nevertheless, some findings in this research relevant to this article: Haynes (1996) argues for a planned educational progression into interdisciplinary writing, and Wittek et al. (2015) claim the importance of which signals the educational design gives to the students on what counts in writing assignments – for instance, is writing regarded as reporting, as interpreting, or as something else (cf. Graue, 2006; Arneback et al., 2016)? These different conceptions of writing are to a great extent related to different disciplines, and therefore influence which design and resources are offered to students in interdisciplinary programmes (cf. Becher & Trowler, 2001).

Resources for learning and writing – analytical concepts

Resources for learning can be conceptualised in different ways. A usual conceptualisation is the Vygotskian notion of mediational means (Vygotsky, 1978; Wertsch, 1998), which can be defined as resources that people learn to apply in certain ways in certain settings and are developed over time. Mediational means often have some kind of materiality, but always a more or less cognitive aspect, as they are used by people. From (Neo-)Vygotskian theories, we take the notion that resources are always connected to social settings and never neutral; neither is learning them neutral or “automatic”: people’s belonging in social settings is relevant to their learning and to their appropriating resources (Wertsch, 1998). However, for resources as analytical concepts, we have chosen a broader definition to cover physical tools, such as books, and non-physical tools, such as verbal actions, as well as human resources, such as peers (Wittek, 2007; Lillis, 2013).

The Academic Literacies approach (e.g. Lea & Street, 1998; Lillis & Scott, 2007; Lillis et al., 2015) shares the idea that learning is strongly connected to the degree of belonging in a community and is never neutral (e.g. Lillis, 2001). Researchers in this field emphasise that for all students to be able to learn through writing in higher education, educators and the arrangements of teaching must consider the perspective of the students and change accordingly. Our study can be seen as an attempt to contribute to this ambition.
From Academic Literacies, we apply Lillis’ (2013) conceptualisation of how resources for writing are related to different communities. Her notions, in turn, are based on other theorists, such as Bakhtin (1986) and Bazerman (1988), and their idea that people reuse what is provided in their settings by their histories. What is reused – tools, language, ideas, etc. – is thereby developed. From this general theory, we find Lillis’ conceptualisation to be helpful. She states that different clusters of resources can be drawn from by individuals in relation to different communities. Community is here a flexible concept, which Lillis puts effort into problematising, but with the general meaning group (Lillis, 2013, p. 105-111; for a discussion on the concept of community, see Lillis & Curry, 2010). Moreover, memberships in communities are not clear cut; rather, an individual can be “moving through many” (p. 109), and the relationship between individual and community can be quite loose. This notion is very applicable to students, who relate to communities in different ways and take up resources from them in differing degrees, and to interdisciplinary settings, where several communities converge, still retaining some of their specific qualities.

Data and general analytic approach

The study has been conducted within a larger research project: “The struggle for the text - on teacher-students meetings and negotiations with different academic writing traditions on their way towards a passed paper”. A Swedish-Norwegian team of nine researchers has investigated this issue, with recursive discussions on a broader set of data and analyses during a five-year period. This means that a first step consisted of different inductive analyses of extensive data from the whole project, within which the project team became aware of interesting differences in patterns of interdisciplinary settings, which led to the research questions addressed in this article. In order to create an equivalent basis for the analysis, we chose to focus on two empirical hubs: (1) the documents describing the content and structure of the courses, and (2) one focus student from each setting to capture resources for learning through writing provided for and used by the students.

The data come from two educational settings at two different Swedish universities in the year 2012-2013, in both cases, degree courses in independent project work. Independent project work is a course consisting of 15 ECTS, half a term, or ten weeks, of full-time studies, in which students write a relatively extensive paper or thesis, also called an independent project (cf. Castello & Donahue, 2012, p. xxi), which is framed by seminars and supervision. Both case studies cover initial teacher education (ITE) in Sweden, operating at two universities, here called East University and West University, that are more specifically described below:

Case 1: An independent project course in an ITE programme for primary school teachers with a mathematics education profile (MEP) was studied in term 5 (out of 8) at East University. The data consist of documents regulating the degree course (syllabus, course description, study guide), two interviews with a supervisor, four with other tutors, and with two students on two occasions each. Also included are three observations of group supervision with four (female) students and the (male) supervisor (also interviewed). These were performed as participant observation, with the researcher
present in the seminar room and taking field notes. Two of the seminars were also audio recorded and transcribed. The focus student here is Kristina, a woman of about 25 who had previously worked in preschools and leisure centres. She is one of the students interviewed twice and is present in all of the observations. The interviews were semi-structured with themes covering the students’ perspectives of the educational design and writing assignments.

**Case 2:** An independent project course within an ITE programme for secondary school teachers with a social studies education profile (SSE) was studied in term 5 (out of 10) at West University. The data consist of documents regulating the degree course (syllabus, course description, study guide), three interviews with one student in the process of writing, his text drafts during the process and one observation of an examination seminar. The focus student here is Michael, a man of around 20 who entered higher education directly after upper secondary school. The interviews were conducted using a semi-structured manual with set themes concerning writing (interview 1: experiences of writing in different disciplines, course switching, interviews 2-3: writing process in independent work). During the second and third interviews, the student’s draft was used as a basis for asking questions.

As explained above, the sets of data from the two settings are not exactly parallel. Apart from the general analytical approach, where data were first collected for the overall project, another explanation is the different pedagogical designs; not least, there were no equivalents to the group seminars at West University to observe (except the examination seminar).

**Specific analytical approach**

Although Lillis’ (2013) conceptualisation (see above) more or less takes its analytical starting point with the individual student, we will move between macro, meso and micro levels in order to discuss the complex situation of how higher education frames students’ possibilities for writing and learning. By looking at regulation documents, as well as data from interviews and observations, we aim to gain a general picture of the relationships of how students’ clusters of resources are conditioned by aspects of interdisciplinarity on levels other than those of the classroom.

Relations between the different levels in an organisation cannot be seen as static. When studying higher education design, our basic assumption is that aspects at the macro level are put into practice at the micro level and vice versa, through human interaction (Linell, 2010). In this article, our main focus is on the meso level, which functions as an interface that connects macro-level contextual factors and micro-level individual or local events, and helps to explain how human actions interrelate with overarching cultural patterns (cf. Linell, 2010). The specific analytical approach is shown in Figure 1 and described below.

In regard to the first research question, on organisational arrangements, we identified how different disciplinarity traditions were combined in curriculum design and study guides on a meso level. Here, Lillis’ (2013) notion of community (cf. disciplines) in relation to resources was the focussing analytical lens. In the analysis process, the document for regulation has been analysed to capture how disciplines are linked
together in the design and content of courses, thus building communities. Regarding the second research question, the data have been coded to capture how resources for learning through writing were prescribed (data: documents and observations) and used (data: interviews and observations). In the findings section, these resources are identified and related to different understandings of learning through writing.

It is important to note that our insider knowledge (emic perspective, cf. Saville-Troike, 2003; Lillis, 2013, p. 85) as researchers employed at universities has had a significant effect on our interpretations. Both our internalised knowledge and informal contacts with other employees have influenced what we have perceived. Although an emic perspective in some cases can have negative effects on research (in the sense of aspects being taken for granted), it can also contribute valuable information to the process. Being from two different universities and disciplines, the two authors had somewhat different perspectives, enabling each to pace back and forth between etic and emic perspectives.

**Findings**

This section is structured on the basis of the two research questions and describes (Question 1) the interdisciplinary arrangement and (Question 2) resources for learning through writing the independent project at two different teacher education settings. We first present the findings from the mathematic education profile (MEP) case and then go on to the social studies education (SSE) case.

**Mathematics education profile (MEP)**

At East University, the department of science and mathematics education, or mathematics didactics, is organisationally located within the Faculty of Natural Science. It was set up only about five years before our study. The staff have PhDs in disciplines such as physics, mathematics and biology, although its research and teaching is focussed on subject didactics (teaching a subject). All teaching within the department is directed towards student teachers.
Interdisciplinarity by a bridging approach (question 1)

In MEP, our general interpretation based on all the data is that the interdisciplinary curricula design has a bridging approach, defined as an interdisciplinary environment with a clear focus on bridging two parts together, creating something new. In MEP, this takes place when mathematics and didactics are linked together to become mathematics didactics (teaching mathematics). In this framing, the relation between mathematics and didactics is not competitive but complementary. The department as such is interdisciplinary in its mix of tutors from mathematics, different disciplines of natural science, and subject didactics. However, subject didactics is the department’s clear unifying focus. In the interviews with tutors, in the documents and in the observations, a clear picture emerges of a unified community (cf. Lillis, 2013), collectively studying how to teach mathematics in the classroom.

The bridging design clearly brings two academic disciplines together to create a new framing that can be regarded as an emerging discipline in its own right. Mathematics is the subject that the student teachers are going to teach, and didactics is the process that creates possibilities for learning, as well as a research field. An important question is whether didactics can be seen as an academic discipline in and of itself or not. However, in the documents analysed it is clear that didactics is not regarded as a part of mathematics. From a Swedish perspective, didactics has often been a part of the academic discipline pedagogy. There are, however, different organisational solutions for didactic research, which shows that it is applied in relation to several disciplines. Nevertheless, in MEP, students experience the setting as interdisciplinary, which is apparent, for instance, in that they are uncertain what subject to put on the front page of their written independent project (observation 3), and when the tutor asks them when they took mathematics, they reply: “What do you mean, mathematics?” (observation 2). Accordingly, our interpretation is that participants in this setting have conceptions of different disciplines, but that they share a notion of the setting, the course and the individual project as relatively unified as mathematics didactics.

Resources for collaborative students (question 2)

In MEP there is a strong emphasis on collaborative learning in relation to a specified structure. An overall pattern in the analysis is that the resources provided for the students construct them as collaborative in order to be able to write in higher education.

The course is governed by a syllabus stating, among other things, that the students are supposed to “analyse data and discuss the findings in relation to pedagogical practice” and “discuss advantages and disadvantages with choices of methodology” (Course Syllabus, 2012, page 2). Another important document is a study guide containing 22 pages of information about the course’s goals, structure and content, assessment criteria and procedures, agenda, assignments for the eight seminars, and instructions for writing the thesis. The course includes conducting a small empirical study (classroom observations, interviews, etc.) and seminars with group supervision and specific assignments (following the steps of the study and writing process). The study guide provides a very neat structure for students’ and tutors’ work. There are step-by-step assignments for the students to do with frequent support from the supervisor and the small group of other students. It states that the general objective of the
independent project is to “deepen your didactic knowledge and obtain tools to develop independently and together with others in your future profession” (Study Guide 2012). A junior research community with clear connections to the profession of teacher is the basis of the course.

The way in which the department structures the writing process includes very specific instructions for each seminar about what to do. Students writing an independent project for the first time are thus supplied with quite concrete resources, giving a very detailed outline of the process. Furthermore, the observations of the seminars show social practices that characterise a research community, such as asking critical questions and defining concepts. The work of the participants is discussed in a process that constitutes a small research group. The students are also offered the resources of a writing centre, a computer hall and a video on interview techniques, which the seminar group watches together with the tutor.

However, the degree course in question is quite demanding for Kristina (interviews 1–2). In the observation data, the students as a group were seen strictly adhering to the study guide. They often referred to it and asked the tutor questions about it (observations 1–3), which we interpret as a sign of being inexperienced with these practices. Kristina also stated that the study guide was very helpful (interview 3).

In Sweden, the structure for the defence of a finished thesis is standard and applies to all levels of education (from the first student paper to the PhD defence) and throughout the disciplines. In this setting, the defence structure is applied not only at the end of the course but is consistently applied throughout it. It was applied by the tutor in all the seminars we observed, first in a loose and scaffolded way, and then practiced independently by the students. The defence practice is also mentioned by the tutors as an important resource.

An important practice within the defence process is that of asking critical questions. The reader, or peer responder, is expected to identify weaknesses and problems in the written text, and, by asking suitable questions, encourage the defendant to consider these and thereby contribute to a scientifically relevant discussion. In academic settings, critical questions can be seen as crucial resources for the academic process of achieving as valid and reliable results and discussions as possible (cf. Blåsjö, 2004). In the study guide, many mandatory and exemplifying questions are expressed, e.g. “Are the research questions formulated in a way that makes them possible to reply to?” (Study guide, 2012).

Furthermore, the IMRAD structure of the text is highlighted in the study guide and in the seminars. IMRAD stands for Introduction, Method, Results and Discussion, i.e. the standard parts of an academic paper (Swales, 1990). In the supervision seminars, the concepts of method, results, etc., and other academic concepts, are used and tested by the students. They often ask and say things such as, “I guess there is a lot of discussion in my results” (Kristina, observation 3). This can be interpreted as their struggle to understand what the concepts means in relation to their work.

Regarding how the students relate to the resources, they sometimes show resistance. For instance, when prompted by the tutor to ask more questions to her peer students, Kristina says, “Well, all these questions, I don’t like them so much” (observation 2). In interviews and in the seminars, students relate to certain resources more than others. These resources are mainly text related: apart from IMRAD structure, they also include
text feedback from the tutor and other students’ drafts – to discuss and learn from what they do and what they do not do. The latter is of course strongly related to the seminars with group supervision. Kristina states having difficulties working with the theses on her own at home, and she and her friend start working together frequently, often in the computer hall: “then you sit beside each other and it’s so practical that you can ask questions when you sit there” (interview 1).

To sum up, in this setting we interpret interdisciplinarity as mainly being put into practice as a bridging subject with a clear focus on mathematics didactics (teaching mathematics). The MEP gives the impression of an environment based on academic collaboration in the form of seminars and group supervision, and the students are constructed as collaborative learners. The theses they write are based on unique data that they have collected themselves. The research process is neatly structured, which scaffolds the students’ learning, but also constrains it. Kristina struggles to understand what to do, and in this, makes use of group supervision and the study guide as prime resources.

**Social Studies Education (SSE)**

At West University, the social studies teacher program is governed by the department of humanities, social sciences and education. In social studies, five different disciplines are involved: sociology, political science, economics, human geography and gender studies. All the tutors have PhDs, albeit in different disciplines. The department is responsible for both teacher education and other, more single-discipline educations.

**Interdisciplinarity by a block approach (question 1)**

In SSE, the analysis of documents indicates that the curricula design utilises a block approach, meaning an interdisciplinary community bringing together different disciplines to work side by side to make it possible to study a phenomenon from different angles. The independent project is undertaken in social studies, a subject that is included in primary and secondary education in Sweden. However, in higher education, social studies is not an academic discipline in and of itself. In the course syllabus (2012), the content of social studies is related to five different disciplines in higher education. The content is thereby put into practice in relation to several academic domains but with no connection to didactics. In order to capture the interdisciplinary block profile, the independent project is framed by the concept of globalisation, an umbrella concept that all five academic disciplines within social science can relate to: “This course focusses on the problems and opportunities that globalisation processes bring in, e.g. encounters between different cultures, legal, political, economic and social conditions” (Course Syllabus, 2012). The course consists of two preparatory sub-courses and an independent project due at the end of term. In the curriculum design of the interdisciplinary school subject of social studies, this university has chosen to a) allow the students to relate to globalisation with aspects from different disciplines by means of problem-based learning (PBL), thereby preparing the students for b) an independent project within this broad palate of disciplines. Here the students are instructed to choose a topic and are allocated a supervisor from one of the disciplines.
Resources for independent students (question 2)

In SSE, an overall pattern is that students are supposed to work individually on their independent project. Writing in social studies is supported by a study guide consisting of nine pages, instructing the students about the parts and processes of writing up an independent project. Our interpretation is that the study guide outlines a very general structure for students’ work. The study guide (2012) informs students about important parts of the writing process and points out that most of the supervision is individual. It also includes information about text layout and examination seminars, as well as principles for assessment. Independent projects in SSE should, according to the study guide, include the following: problem definition, theoretical framing, method, data, analysis and discussion. The students are instructed to link these parts together. The following passage is an example of how the study guide addresses the students:

When You have chosen a topic and formulated the problem You want to study, You will reach the next step in the research process. Namely, the choice of how to relate to the problem and with which tools You will be working. Therefore, You need a theoretical frame and tools that combine theory and empirical work (Your own study). (Study guide 2012)

This passage highlights the need for and use of theory, but gives no indication as to what theory means in this specific context. On the one hand, this framing provides an overall picture of how academic writing is usually structured in SSE, partly based on IMRAD. On the other hand, it grants students a large space in which to navigate.

Our interpretation is that the design of this course focuses on the strong independence of students in their writing process. In terms of content, some of the sentences in the study guide describe what the students are specifically expected to learn and do. The first page states that it is a social studies course and that students should call their work a thesis in “Social studies, globalisation, advanced level” (Study Guide, 2012). Thus, both the focus on “globalisation” and the general structure of the study guide can be understood as a way of facilitating a broad framing for students and tutors in this interdisciplinary setting of social science.

The strong emphasis on independence has a clear impact on which resources are provided to and used by the students. First of all, the students themselves are their own resources in terms of their life experiences. In this course, they are encouraged to stand on their own two feet. They are also presented with the various parts of the thesis as resources: method, theory, etc. They have access to individual supervision on a regular basis and a study guide that describes how they are supposed to write. In the study guide, students are told that: “The independent project is in fact an independent work where You take the responsibility for the work that is carried out” (Study Guide, p. 2). Throughout the text, the students are addressed as You, Your and Yourself, with an initial capital letter, an atypical and old-fashioned way of writing in Swedish. We interpret this as a reflection of the focus on individual, independent students in this setting.

The student Michael, whom we followed, found the course demanding in many ways because he had not previously undertaken such a large piece of academic work. The concept of strong independence is a difficult one for him to grasp, and he struggles with how to navigate the general structure: “how to write and how to build up the thesis feels fuzzy” (interview 2). He also struggles with several issues in his writing process, such as what it means to choose and use a theoretical perspective, which method he should use,
what is meant by empirical data and which disciplines he should relate to. He feels that
these requirements are difficult to meet and expresses that “they probably think that
you should have these skills when you enter higher education” (interview 2). In an
attempt to understand what to do, Michael uses part of the study guide:

The analysis is about finding an answer to Your purpose and Your questions. In the
analysis You relate theory/previous research and empirical data, to reach the answer to the
questions. (Study Guide p. 4)

The above quotation describes the relation between theory/previous research, empirical
data and method. However, at the beginning of the writing process this is difficult for
Michael to relate to, and he turns to his supervisor for support (interviews 1-2). He
describes this master–apprentice relationship as positive for his writing and appreciates
getting feedback on his writing.

Michael also uses other resources for learning. The students are given a lecture on
academic writing and tips on relevant literature relating to methodology (interview 2). He
also turns to his fellow students to discuss and compare how they relate to the task,
but says that he wishes there was more organised collaboration because “it is always
good to get other perspectives on your thoughts. It’s easy to get stuck in your own
bubble when you write” (interview 2). In the interviews with Michael and in the text
drafts, it is clear that he starts his project by defining the problem and visits the library
to search for information about the topic (interview 1 and text version 1). These
resources have been used in the PBL work on globalisation during the first 10 weeks
of the course, and he is familiar with the procedure.

In the second interview, Michael talks about his struggles to interpret the scientific
concepts that he is supposed to use in his thesis: theory, method, empirical data and
analysis. At this stage, his text includes more specific research questions and an over-
view of the topic, mostly from a historical perspective. Michael calls his text “literature
review” (text version 2) and describes it in the following way: “Most of the work I have
done relates to references, reading books and writing down the references. The basis of
the thesis is right there. But now I have to try to turn it into a fluent text” (interview 2).
He is not sure how to move from his literature review to an analysis and is looking
forward to meeting his supervisor for help. Later, Michael writes in his thesis:

The qualitative approach in this work has been to use previous research reported in books.
This previous research has resulted in a literature review, which also forms the basis for my
thesis. This previous research thereby becomes my theory. In order to use previous
research in my thesis I have used some public and political documents. (Michael’s thesis,
final version)

The quotation shows how Michael tries to find ways to use and relate to the concepts
mentioned in the study guide to his thesis. Here, the literature review becomes both
previous research and theory, and in order to “use the previous research” he turns to
some public and political documents.

At the end of the course, the independent work is examined in a seminar described
as an educational event: “The seminar is part of the learning process and has a
deepening function for the author and the reader, as well as the other participants”
(Study Guide, p. 7). In the final interview, directly after the examination seminar,
Michael is still struggling to understand how to make use of the scientific concepts named in the study guide (interview 3). Most of all, he struggles to understand what a method and an analysis are, and asks the interviewer if he has applied them in the correct way.

Overall, the analysis indicates that student teachers specialising in social studies are given a broad frame of an interdisciplinary field that mainly focusses on IMRAD structure. There is also a strong emphasis on independence and individual guidance with an opportunity for individual interest, which means that students have to manage their own time and work.

**Discussion**

In this section, we compare and discuss the analyses, and answer our research questions. As is so often true, it is impossible or at least difficult to state exactly what causes what in the data. However, the general picture we aimed at can be described as in Figure 2.

The first main finding is that the design of interdisciplinarity at the meso level creates different types of environments to answer to different needs in the organisation of teacher education. The case studies show differences in the way the disciplines are linked together. These different types of interdisciplinarity can be described in terms of a bridging approach in MEP at East University and a block approach in SSE at West University. In MEP, mathematics and subject didactics (teaching a subject) complement each other and have evolved into a new interdisciplinary discipline (mathematics didactics). A single department with a unified perspective on its identity of subject didactics administrates the degree course. The bridging is to a great extent governed by the focus on the teacher profession, and the basis for interdisciplinarity is mainly to focus the subject mathematics on didactics (teaching in schools). Another possible background to the bridging approach is that the disciplines involved are focussed on differing aspects (pure mathematics and other sciences vs. teaching mathematics) not in conflict with each other. In SSE the different disciplines are organised side by side, as the main basis for interdisciplinarity in this setting is the need to organise the content according to the school subject social science. Therefore several different departments with different disciplinary identities are involved in the course. In this setting, there may be complementary as well as conflicting perspectives, for example, concerning

| Level          | East University, MEP                           | West University, SSE                          |
|----------------|-----------------------------------------------|-----------------------------------------------|
| Macro level    | National regulations                          | National regulations                          |
| Meso level     | Interdisciplinarity as a bridging approach    | Interdisciplinarity as a block approach        |
| Micro level    | Collaborative learning                        | Independent learning                          |
| Didactics      | Visible (mathematics-didactics) – basis for interdisciplinarity | Non-visible                                    |
| Future school subject | Visible but not salient (mathematics) | Visible (social sciences) – basis for interdisciplinarity |

**Figure 2.** Findings.
globalisation, which can make the disciplines more difficult to bring together. Although the two interdisciplinary environments are different in kind, we also want to highlight that they both have emerged in relation to different aspects of teaching in schools (didactics and/or school subject).

This interpretation can be connected to Becher and Trowler’s (2001) notion of academic “tribes” watching their boundaries. As Lillis (2013) and others state, academic communities are not stable and distinct. In an interdisciplinary setting, deciding the contours of the community of practice could prove challenging. There is thus a need for dialogue between the disciplines on the meso level in order to decide on and design the common ground for teaching in an interdisciplinary context. In this process, it is important to understand that the organisation of interdisciplinarity may be based on different needs and affect the resources provided and used for learning through writing.

The second main finding points to the similarities and differences in the resources for learning through writing in the two environments. As for the specific resources, several of them are the same or similar in both settings: other students, writing centre, study guide, etc. In both settings, some parts of the work are performed individually, and others collectively. However, in the MEP, aspects of collaboration and collectivity can be seen in resources such as group supervision, questions (an interactional resource) and research methods, of which nearly all students use the same (interview, transcription, categorisation, etc.). In the SSE, aspects of individuality can be seen to dominate in resources such as individual supervision, the library and literature tips for reading on your own. As for research methods, these are different, dependent on which discipline each student chooses to relate to in the thesis.

In the two educational settings, we can thereby identify patterns of different student positions in relation to learning independence and collaborative learning. One possible reason lies at a macro level, in the specific disciplines that are combined; as previous research has shown, scientific research is often based on collaboration, while social science research is often carried out individually (Becher & Trowler, 2001). Another possible reason is the organisation of interdisciplinarity in itself, on a meso level. A bridging approach makes it easier to find a common ground for collaboration, compared to a block approach where the students choose individually between different approaches to writing. Moreover, whether didactics is an integrative part of the taught discipline or not is a key factor in the conception of the discipline as having been designed as either a common/bridging or individual/block approach.

Our analysis thus shows that the two educational settings have different understandings of the concept of independent. “Independent project” is the term used in the regulating national documents and is a broad term for this type of more advanced work. In Swedish, one of the definitions of the term independent is “having the ability to act and think without aligning to others” (Svensk ordbok, 1999). A partly different definition is closer to the English ‘independent’, ‘free’. In MEP, the concept is understood as ‘scientific’ and ‘academic’ (in contrast to a student who just restates common knowledge; close to the first definition), and in SSE as ‘with own responsibility’ and ‘on your own’ (closer to the second definition) (cf. Magnusson 2015). One consequence can be that the former education focusses more on collaboration than the latter.

To return to the three general questions raised in the introduction, this study has confirmed that the interdisciplinary situation is quite complex. We have shown, firstly,
how different universities can arrange different ways of “doing interdisciplinarity”, here in either the block approach or the bridging approach, and how this may influence or condition students’ writing. Secondly, with the help of a case study from a Nordic country, we have increased the understanding of how university educations can be organised interdisciplinarily and implemented, with respect to student writing. The Nordic phenomenon of subject didactics (Ongstad, 2005; Qvortrup & Krogh, 2015) can serve as an example of how emerging disciplines can be shaped. And thirdly, in light of the empirical findings, we may discuss different notions of subjects. Research is commonly focussing on how different aspects of knowledge (such as academic knowledge or national regulations) are put into practice in a new context, such as teaching in schools (see e.g. Bernstein, 1971). Here, the case is rather the opposite, as our study shows how school content affects the organisation of teacher education, requiring either the need for a didactic approach or the arrangement of disciplines to fit the school subject. Unlike lawyers, doctors or psychologists, teachers in schools are normally not acting out one certain discipline, but forming different subjects for pupils. There is a significant difference between writing as a mathematician and as a math teacher, or as a social scientist and as a teacher of social studies. This rather obvious fact is seldom made explicit (however, cf. Rai & Lillis, 2013).

Conclusion

This study has looked at the relation between organisational arrangements and the resources for learning and writing provided by these organisations. In between these two approaches, we have pointed to two interrelated aspects of the problem: to what extent the educational setting can be regarded as a community (cf. Lillis, 2013) and how students are constructed in these settings. On the basis of data from different levels, we have confirmed that organisational arrangements on a meso level may influence teaching practices and students’ conditions for writing on a micro level. In the setting implementing a bridging approach, the students were constructed as collaborative in a more or less unified research community into one teacher education discipline, formed by several scientific disciplines. The resources here had a tendency to cluster towards the collective, e.g. shared research methods and group supervision. In the setting using a block approach, the students were regarded as independent in relation to several research communities within social sciences. Here, we could see a clustering of resources associated with independence and individuality, such as the library and individual supervision.

For this study, the interdisciplinary situation was the starting point. Of course, with different starting points - or other analytical approaches or data - the picture and comparison of the two educations would have been different. The research team’s more or less emic perspective certainly influenced the study and the results. The results are not meant to validate the quality of either education. However, the results can contribute to a discussion on the arrangements of higher education and the role of writing within it.

Notes

1. References to data is omitted due to anonymity reasons.
2. All quotes from the data are translated from Swedish.
3. On the use of ‘You’ with an initial capital letter, see below.
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