



Designing and redesigning research-based teacher education

Hilde Wågsås Afdal^{*}, Kari Spernes¹

Department of Teacher Education, Østfold University College, Norway



HIGHLIGHTS

- Designing research-based teacher education must be recognized as a complex process.
- Students explored professional problems using research-based methods and literature.
- Academic reading enabled integration of research- and practice-based knowledge.
- A research-based TE involves parallel processes and longitudinal perspectives.
- Students must be active participants, socialized into a research practice.

ARTICLE INFO

Article history:

Received 25 August 2017

Received in revised form

14 May 2018

Accepted 18 May 2018

1. Introduction

Calls for research-based teacher education (TE) programs have increased over the past decade.² The growth of the Bologna process and initiatives from international organizations, such as the Organization for Economic Cooperation and Development (OECD; European Ministers of Education (e.g. [Bologna Declaration, 1999](#); [Commission, 2005](#); [Commission of the European Communities, 2007](#); [OECD, 2013](#)), have put strong pressure on higher education institutions and staff to address the relationship between teaching and research and to develop strategies to meet the requirements for research-based curricula ([Brew, 2003](#)).

A growing body of research in Europe and North America shows that research-based TE is a requirement and aim in policies, educational research, and TE practices ([Darling-Hammond, 2017](#)). Two focal questions appear across the studies mentioned above: (1) Why do teachers need the kind of education and competencies that research activities provide for their growth as teachers? (2) How

might a research-based TE program be initiated and organized in TE?

The arguments for why are manifold. First, global competitiveness creates a need for developing 21st-century skills, such as active learning, critical reflection, and problem-solving ([Greiff et al., 2014](#)). [Niemi and Nevgi \(2014\)](#) showed that such skills enable teachers to continuously renew their curricula and teaching approaches and to take a position as knowledge creators rather than knowledge recipients. A considerable body of research shows that research-based professional practice (see e.g. [Author, 2014](#); [Cochran-Smith & Lytle, 2009](#); [Darling-Hammond, 2017](#); [Westbury, Hansén, Kansanen, & Björkvist, 2005](#); [Zeichner, 2010](#)) is built on research-based TE. These studies argue that research-based TE enables teachers to make autonomous, rational, and theory-based decisions and to integrate research and practice in a profound way. [Parkison \(2009\)](#) showed that research-based TE courses foster in professionals the ability to recognize shifts in students' needs. [Dunn, Harrison, and Coombe \(2008\)](#) showed that research-based TE promotes an attitude among prospective teachers to seek continual professional renewal.

Furthermore, a substantial number of studies focused on how to initiate and organize research-based TE looked at the character, content, and structure of research-based TE ([Cochran-Smith & Fries, 2005](#); [Cochran-Smith & Zeichner, 2005](#); [Jyrhämä et al., 2008](#); [Kansanen, 2007](#); [Munthe & Rogne, 2015](#); [Toom et al., 2008](#)). Most of these studies suggested that to develop analytical skills, critical thinking, and reflection student teachers must be active participants in the research processes during the TE program. Thus, research-based TE involves educating prospective teachers in a specific style of thinking and acting that stems from the principles and methods of scientific work ([Griffiths, 2004](#)). Other studies have explored the role of research and the findings of research-based activities and knowledge in TE ([Author, 2012, 2013, 2018](#); [Aulls, Magon, & Shore, 2015](#); [Maaranen, 2009](#)). Activities that imply

^{*} Corresponding author. Østfold University College, Faculty of Education, Norway.
E-mail address: hilde.afdal@hiiof.no (H.W. Afdal).

¹ Østfold University College, Faculty of Education, Norway. kari.spernes@hiiof.no

² The terms "research" and "inquiry" are subject to different interpretations. In this article, they are used interchangeably.

Table 1

Learning outcomes concerning the requirements of a research-based program (Kunnskapsdepartementet [Ministry of Education and Research], 2010).

Knowledge
- has knowledge of national and international research and development work relevant to the teaching profession.
Skills
- can independently, and in cooperation with others, plan, implement and reflect on teaching in and across subjects based on research and experience-based knowledge.
- can critically reflect on his/her own and the school's practice in terms of further developing the role of the teacher and professional ethics.
- can assess and use relevant research results and carry out systematic development work.
- can contribute to the professional teaching community regarding the further development of good practice and the professional ethical code.
General competence
- possesses the ability to change and develop the school to handle future challenges.

approaching research literature critically and systematically (van Ingen & Ariew, 2015) and theoretical and practical scientific methods have been integrated with other teaching and learning activities in the program. We summarize the findings above with Dobber, Akkerman, Verloop, and Vermunt's (2012) wording. They described research as a promising activity that educates student teachers but only when it is done in a "purposeful, deliberate and reflective way, embedded in a program that highlights inquiry of teaching as a continuous part of practice" (Dobber, Akkerman, Verloop, & Vermunt, 2012, pp. 609–610).

Despite the growing body of research on different aspects of research-based TE, there is still an extensive debate regarding what research-based education means and how it should be organized. Relatively few studies offer in-depth insight into how specific research-based teaching and learning activities are initiated and carried out, and how the outcomes of learning are evaluated. This article offers a longitudinal exploration of how a research-based TE course may be designed and redesigned when it comes to teaching and learning activities. We also explore possible learning outcomes and how the students assessed the activities we initiated.

1.1. Context of the study and research questions

In the Norwegian context, the requirements for research-based TE programs are reflected in the Higher Education Act (Kunnskapsdepartementet [Ministry of Education and Research], 2005) and in several white papers (Kunnskapsdepartementet [Ministry of Education and Research], 2012–2013; Kunnskapsdepartementet, 2008–2009; Kunnskapsdepartementet [Ministry of Education and Research], 2007–2008). In 2010, the Norwegian Ministry of Education implemented a new national curriculum for TE, which is legally binding for TE institutions.³ The program includes a four-year integrated program (undergraduate plus one year), and students have to select whether they want to focus on teaching in grades 1–7 or 5–10. Major knowledge requirements are emphasized in the common introduction to the curricula documents. For example, the program should be profession-oriented, integrated, and research-based (Kunnskapsdepartementet [Ministry of Education and Research], 2010). Table 1 presents the learning outcomes in the national curriculum concerning the requirement for a research-based program.

We introduced a new institutional curriculum at XXX College (located in XXX, Norway) [details removed for peer review] in order to meet the national requirement for research-based TE. The new curriculum for TE in grades 5–10 at XXX College was developed alongside and integrated with a research study that aimed to follow

the structure and activities we, the program coordinators, and the lecturers (the researchers) initiated. Our study aimed to contribute to other studies on research-based TE by exploring:

- The processes and outcomes of the teaching and learning activities initiated in a specific research-based course;
- The effort to integrate research-based and practice-oriented activities in the course;
- The complexity of and interrelations between teaching and learning activities over time;
- A research-based education program that is designed with more student involvement where student feedback assists in shaping and reshaping activities;
- Longitudinal perspectives, following the activities and students for four cohorts;
- Employing a much-used conceptual model for undergraduate research and inquiry as inspiration for designing teaching and learning activities.

Using the design-study research tradition (e.g. Brown, 1992; Shavelson, Phillips, Towne, & Feuer, 2003) as a point of departure, we developed a three-year design based on Healey and Jenkins (2009) model of undergraduate research and enquiry. In line with the design-study tradition, we altered the program and changed the teaching and learning activities several times based on our acquired experiences, data collection, and analysis throughout the six-year research period (following two cohorts plus supplementary data collection; see Table 4). The aim was to implement a research-based profile to implement activities that connected education, research, and professional practice in a course called "Science of Education,"⁴ which was taught over three years for 60 European Credit Transfer and Accumulation System (ECT) credits. This course was given a specific role within the national curriculum to act as an integrative component with the specific responsibility to connect on- and off-campus activities and learning sites. The main research questions for the overall study are as follows:

- 1) What characterizes the learning processes and outcomes visible among the students in the activities that are initiated through the TE program design?
- 2) How do the students evaluate and assess the research-based design of the course?

Learning outcomes include the academic outcomes expected from the TE course, as well as the outcomes of preparing for professional practice. We also discuss the way(s) in which a conceptual model for undergraduate research and inquiry can inspire the design and redesign of teaching and learning activities in a research-based TE course.

³ In August 2017, a five-year integrated master's program replaced the program examined in this article due to the requirements of the new national curriculum. However, the emphasis on research-based programs is formulated almost in an identical manner except for the addition of the master's thesis.

⁴ In Norwegian: "Pedagogikk og elevkunnskap."

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