

Incorporating research in professional bachelor programmes

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Theme

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Abstract

This conceptual paper describes the role of research in bachelor programs at Dutch Universities of Applied Sciences (UAS) . It presents a model for the integration of research activities into student assignments. The model makes it possible to distinguish between different levels of research. The model can be helpful in designing research education for professional bachelor students and developing practice-based assignments to assess research competences.

Introduction

Dutch universities of applied sciences are institutions for higher professional education (HPE). They are primarily responsible for offering programmes which prepare students for specific professions. These tend to be more practice oriented than programmes offered by traditional research universities, who aim to educate professional researchers. They offer degrees in a wide range of topics like nursing, engineering, management, education and arts.

Traditionally research has never been a primary task of these universities of applied sciences. This changed at the end of the 1990's when some universities started to hire professors ('lectoren') responsible for developing a research function within these institutions. The research function was formalized by law in 2001 and specific funds were created to hire professors. In 2010 the 39 Universities of Applied Sciences employed 457 professors. In 2008

they spend about 105 million Euros on practice-based research. The research topics and questions address practical problems in the professions for which these universities educate. The results of the research is often directly applicable in practice and often a client is involved.

The upcoming research orientation of these universities is also visible in bachelor education. The European Bologna Treaty in 1999 states that highly educated professionals should be able to function in the knowledge economy (Griffioen 2013). This treaty is a first indication that research skills play a role in professional bachelor education. To make this more concrete the so called Franssen Committee in The Netherlands proposed 10 criteria for professional bachelor education. These criteria among others pointed towards research when they state that bachelor students must be able to define and analyse complex situations, work according to a plan, apply theory, develop solutions, reflect on action and work methodically.

The international Dublin Descriptors from the Joint Quality Initiative (2004) offer an additional view on the implications of the treaty. The descriptors describe standards for first (bachelor), second (master) and third (PhD) cycle awarded students. The first cycle descriptors state among others that bachelor students must be able to apply knowledge to self problems in their field of study and must be able gather and interpret relevant data. This is a another indication that an ability in the field of research is required for these students.

In 2009 the Netherlands Association of Universities of Applied Sciences (2009) for the first time explicitly declares that every bachelor student must obtain a research ability: ‘In our modern society, it is also crucial that graduates with a bachelor's degree from a university of applied sciences have a critical mind which allows them to reflect, to engage in evidence-based practice and to innovate.’ (p.10). In this English translation of the text the Dutch phrase ‘onderzoekend vermogen’ translates into ‘critical mind’. However, the phrase ‘onderzoekend vermogen’ indicates more than just a critical mind and can more appropriately be translated into ‘research ability’. From the Dutch text one can conclude that it is no longer sufficient for bachelor students to be able to apply the results of research, but that students must be able to conduct research themselves.

Although the ambition is set to provide bachelor students with research ability, no further indication is given to the meaning of the term research ability, nor of how research should be integrated into the curricula of the institutions. This has left many managers and teachers with

questions about the nature of the research in bachelor programmes, the required level of expertise for bachelor students and the way research should be taught in HPE.

This paper aims to help end the confusion by providing answers to the following questions:

1. How can research in higher professional education be defined?
2. What demarcates the difference between research in bachelor and research in master professional education?
3. What is the role of research in professional education at bachelor level?
4. What are guiding principles for incorporating research in bachelor programmes and examination?

To answer these questions this conceptual paper describes a model for positioning research activities in professional education. The paper is structured as follows. First a definition for research is chosen that allows for precise demarcation of research activities and levels. This provides an answer to question 1. Based on the proposed definition various levels of research are defined to distinguish research in bachelor and research in master professional education (question 2). Then the POKI competency model is presented (Greve et al. 2009) and expanded to include research activities. The model describes the role of research activities in the creation of professional products. This model helps to answer question 3. Finally, the model is used to develop guiding principles for incorporating research in bachelor programmes and examination, answering question 4.

Defining research

To determine the role of research in HPE we need to define the concept of research. There are many views on the nature of research. The overview of Griffioen et al. (Griffioen et al. 2013) shows that research has two defining characteristics that are common to most views on research:

1. Research aims at developing new knowledge
2. Research is a structured process

A definition of research that uses both characteristics is the definition by Verschuren (1994) (translation DA): ‘Research is a goal oriented and methodological search for new knowledge

through answering questions developed in advance according to a specific plan.’ This definition provides some clarity on a number of issues.

First, this definition stresses the importance of questions in research and describes the result of research as answers to those questions. This implies that the result of research is information or knowledge and not (yet) a reality that has changed or improved. So research that is aimed at solving a practical problem stops when the knowledge that is needed to solve the problem has been found. Implementing that knowledge to solve the problem is not part of doing research. As we will see below, this is an important notion in the context of HPE because this type of education is aimed at preparing students for positions in which they often must induce change (be it with patients, clients, products or audiences).

Second, the definition stresses the importance of method in answering questions. This is important for HPE because the Fransen Committee in its criteria stressed the importance of working methodically for bachelor students. Research is defined as an activity of methodologically answering specific question.

The definition of research proposed by Verschuren (1994) is used in the next paragraph to develop a proposal to distinguish between various levels of doing research and discriminate between professional bachelor and professional master level.

Levels of research ability, a proposal

In the previous paragraph research is defined as the act of methodologically answering predefined questions to develop new knowledge. In order to distinguish between bachelor and master levels of doing research we can look at what can be understood as ‘new knowledge’. There can be various levels of ‘newness’: 1) knowledge that is new for the student, 2) knowledge that is new to the client, 3) knowledge that is new for a particular discipline, or 4) knowledge that is new for the world. These levels are the first dimension that can be used to demarcate the type of research that we expect from professional bachelor students.

A second dimension that we can use to distinguish between levels of research is the level of external validity, the extent to which the results of the research can be generalized to other situations and to other people. The results of a research question can have varying degrees of external validity: 1) no external validity because they only describe the phenomena studied, 2) the results can be generalized to a small, well specified group of situations or people (e.g. the

employees of a particular organization) or 3) the results can be generalized to a wide group of situations or groups. The bigger the external validity ambition of a research study the higher the methodological requirements regarding for example the sample and the techniques used to analyse the data, and the more complicated the research.

Using both dimensions it is possible to define various levels of complexity of research (see table 1).

Table 1 Levels of complexity of research and their role in HPE

External validity: New to:	Not generalizable beyond situations or people studied	Generalizable to a small, well defined group	Generalizable to a wide group
the world	PhD level		
the discipline	Professional master level		
the client	Professional bachelor level		
the student			

The proposal offered here is that professional bachelor students should be able to conduct research that results in knowledge that is new for themselves, new for their client and specifically applicable to the situation studied. This includes for example diagnostic research on patients to determine their illness and choose a suitable treatment or research within an company to determine the problem and develop a solution. This latter type of research often requires that the result of the data gathering (for example data collected by surveying employees) is generalized to a well-defined group (e.g. all employees of the company). This is why the dividing line between bachelor and master is drawn as a dotted line.

Master students should be able to do research that leads to answers that are new to a specific profession or discipline. This often requires being able to draw generalizable conclusions from a limited data-set. A master student in physiotherapy should be able to develop a particular treatment and perform tests to ensure it is effective over a number of different cases. A master student in Engineering should be able to draw conclusions about the applicability of a specific design in a variety of circumstances.

PhD students are required to develop knowledge that is ‘new to the world’. They must be able to add new knowledge to the existing scientific knowledge base. This often requires well designed studies that allow for generalization.

Using these two dimension research in professional bachelor education can be defined as the act of methodologically answering predefined questions to develop knowledge that is new to

both student and client and specific to the situation or (group of) people studied. Using this definition it is possible to be more specific about the research ability required for professional bachelor students. In the next paragraph this demarcation of research in bachelor education is used to describe the role of research in the professions for which HPE educates.

The role of research in professional bachelor education

In professional bachelor education students master a particular profession. They learn how to produce the ‘products’ that are common in a particular profession. A product in a profession is the result of a particular assignment. The product of a consultant is an advice or recommendation, the product of an architect is a design, the product of a nurse is care. Students learn working methods to produce these products. In professional bachelor education learning working methods is the core of the curriculum.

This way of looking at professional bachelors makes it possible to position the role of research as defined above. Professional bachelor education is not aimed at becoming a researcher, it is aimed at becoming a good professional. Doing research can support this. Research supports professional behaviour by providing the information needed to produce professional products.

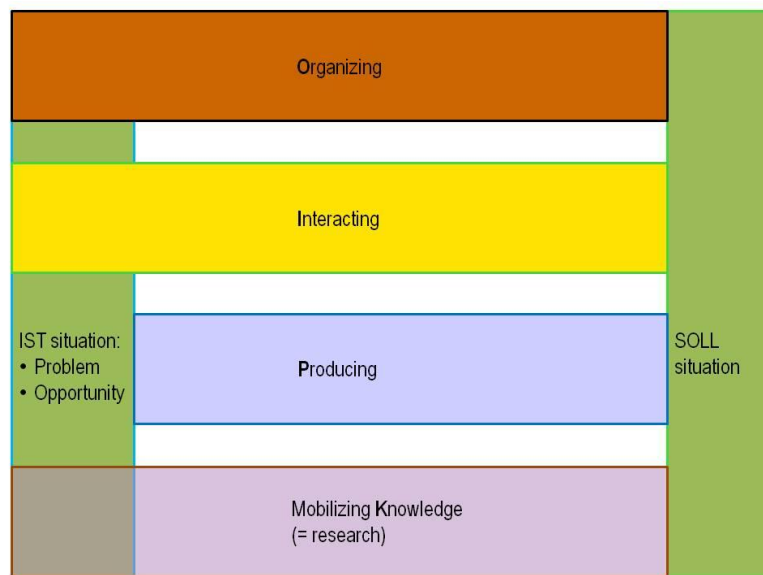
Working methods like a method for developing software or diagnosing a patient often consist of a series of steps and in these steps questions need to be answered. Some questions are important enough to require high quality answers. For example, the success of a software solution depends to a large extent on the quality of the problem analysis. This analysis requires answering specific questions in a methodological way; in other words it requires research. Research can provide answers to questions like: what do various stakeholders perceive as the problem? What are the IST and the SOLL situations?

Research is one of the supporting processes that students need to master to produce high quality products. Greve et al. (2009) state that in engineering professional assignment requires four of those processes: 1) a process of producing the product 2) a process of organizing the assignment, 3) a process of interacting with the client during the assignment, and 4) a process of knowledge mobilization.

Here it is argued that these four processes are not only applicable to engineering but to any professional assignment. In all professions for which HPE educates professionals need to

solve problems or realize opportunities. This involves a journey from an IST situation to a SOLL situation in which the four processes of mobilizing existing and new knowledge, producing results, interacting with a client, patient, employee, pupils or audiences and organising the whole process. The model by Greve et al. has recently been named the POKI model, after the four key processes it contains: Producing, Organizing, mobilizing Knowledge and Interacting (see figure 1). In the POKI model the process of mobilizing knowledge is the process of methodically answering questions (= research).

Figure 1: The POKI Model



The POKI model is a general model that can be used to design curricula and develop student assignments. Curricula should pay attention to 1) teaching working methods common to the profession (P in POKI), 2) teaching research skills that contribute to the quality of the working methods (K in POKI), 3) teaching project management skills to organize the project (the O in POKI), and 4) teaching communicative or sometimes advisory skills (the I in POKI). In addition, the POKI model can help to develop assignments through which students can learn to work on complex problems in a methodical way. Assignment should address all four POKI processes in an appropriate way.

The way research is positioned within the POKI model has consequences for the way research ability is taught and assessed and how research is incorporated in the programme. This is described in the next paragraph.

Incorporating research in bachelor programmes

The view on research as outlined above leads to a number of guidelines for incorporating research into bachelor programmes:

1. The specific research skills required at bachelor level will differ, depending on the specific demands by the profession the programme educates for. For example, a marketing consultant needs to have more knowledge of statistical techniques than a musician. An engineer needs to know more about measurement techniques than a social worker.
2. Teaching research skills should be incorporated into the regular programme as much as possible. As research has a supporting role in producing quality professional products, teaching research should be incorporated into teaching professional working methods. Courses in working methods should pay attention to the questions that these methods contain that may require research. When separate research modules are needed they should make constant reference to real life situations in which the research is used (Van der Linden 2012).
3. Real-life assignments should include research tasks. Over a four year course these assignments should become more complex and the available external support should decrease.
4. When one complex assignment is used as a final exam, this assignment should be designed in such a way that it assesses all competencies of the programme. The consequence of this rule is that in HPE final assignments cannot be only 'research assignments' because such assignments are not representative for all competencies that need to be assessed. The traditional 'thesis' that we know from traditional research universities is in most cases not the appropriate assessment tool in HPE.

Conclusion

Dutch Universities of Applied Sciences struggle with incorporating research into their bachelor programs. This paper aims to shed some light on this issue in three ways. First, by proposing that bachelor students should obtain the ability to conduct research that results in knowledge that is new for themselves, new for their client and specifically applicable to the situation studied. Second, by proposing that research is seen as one of four supporting

processes in the production of professional products. And third, by proposing that research is integrated as much as possible into the regular curriculum, including the final assignment.

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