Bianca Roseaux, Ilse Verachtert, Pieter Spooren, Peter Van Petegem
University of Antwerp, Belgium

The construction and validation of a mapping instrument for the research-teaching nexus in higher education (0134)

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Introduction

Lecturers often consider the interrelationship between research and teaching as evident (Brew, 2006). As a result, the RT nexus remains implicit in education. However, two major developments triggered the discussion about the RT nexus at the University of Antwerp, a middle-sized university in Flanders (Belgium). First, demonstrating the interrelationship between research and teaching has become crucial to universities in Flemish higher education to obtain a positive evaluation in the institutional review audit. At the same time, an integration of academic university college programmes into universities takes place. This movement challenged the existing academic programmes of universities to reflect on their academic orientation.

To anticipate on both tendencies, we developed a questionnaire that measures the RT nexus. The instrument aims to identify the interrelatedness research-teaching in the learning activities at course level. At the same time, it also provides an overall view of the RT nexus at programme level. We hope that (feedback of) the results will enable and stimulate lecturers and educational boards to reflect in order to enhance the RT nexus (Elen & Verburgh, 2008).

Objectives

This contribution discusses the construction and validation of an instrument for mapping the RT nexus at both course and programme level.

Methods and Results

Literature study

Healey's framework was chosen as the theoretical basis for the questionnaire (Jenkins & Healey, 2005) . The main reasons for this choice were the international recognition of the framework and its didactic character due to its clarity (Elsen, Visser-Wijnveen, van Driel, 2009). The framework has two axes, one from an emphasis on research content vs. research processes, the other from a student-focused approach to a teacher-focused approach (Jenkins and Healey, 2005). Based on these two axes, four approaches are distinguished: research-led, research-oriented, research-tutored en research-based.

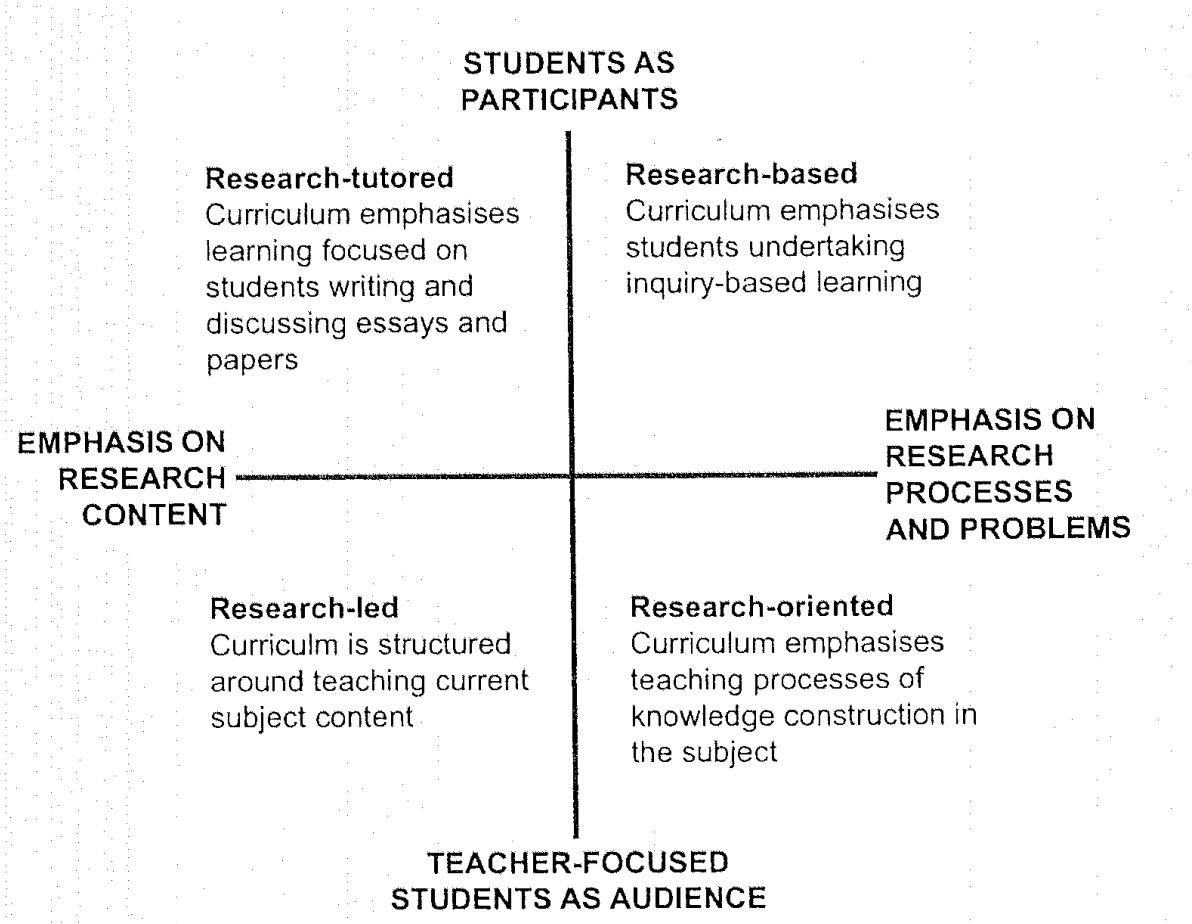

Figure 1. Curriculum design and the research-teaching nexus (Jenkins & Healey, 2005)

Instrument construction

For each of the four approaches, four items were formulated that express a corresponding learning activity. The educational learning activities were formulated, based on Bloom's taxonomy (Krathwohl, Bloom, Masia, 1971).

The preliminary 16 item questionnaire was presented to two education experts, who were given two assignments: a) situate the items in the quadrants of Healey's framework, b) score every item for a course you teach on a scale from 1 (very limited) to 4 (to a large extent). Based on this exercise, several items were adjusted. After consulting an educational and a statistical expert, it was decided to add 16 extra items to the questionnaire (ending up with 8 items per approach). All items are measured on a four-point scale ranging from 'very limited' to 'a large extent'. Table 1 shows a sample item for each approach.

Table 1. Overview of dimensions and sample items in the RT nexus test instrument

Dimension	**Sample item**
Research-tutored	In this course, students learn to critically judge the scientific value of a research report

Research-based	In this course, students plan and execute their own research project and report on the results
Research-led	In this course, students become familiar with important concepts and theories in the study domain (in which this course can be situated)
Research-oriented	In this course, students learn how to define a research problem and to formulate an appropriate research question to handle this problem

Empirical testing

In a second phase of the validation process, this version of the questionnaire was presented to the lecturers of the Department of Social and Political Sciences. They were asked to fill in the questionnaire regarding the courses they teach (241 courses in total) .The data from this survey (which is executed in an online environment) will be used for the further validation process. Lecturers will complete the survey between June and September 2013.

Exploratory factor analyses (EFA) for each separate dimension approach on the preliminary results (based on data of 54 courses, June 2013) already provide evidence for the convergent validity and internal consistency of the items in the various dimensions. Table 2 contains an overview of the most important results so far.

Table 2. Preliminary results of EFA models (N=54, response rate = 22%)

Dimension	**N° items in the test instrument**	**N° remaining items in the factor**	**Cronbach's alpha (remaining items)**	**Lowest item loading**	**Highest item loading**	**Variance explained**
Research-tutored	8	4	.75	.55	.85	23%
Research-based	8	4	.85	.49	.84	31%
Research-led	8	4	.79	.62	.75	30%
Research-oriented	8	8	.94	.68	.93	66%

Note. Factor analyses were done with the SPSS principal axis factoring routine and used varimax rotation. Scree plots were used to determine the number of factors. The minimum item loading for inclusion in a factor was set to .45.

These results offer a promising perspective towards the next steps in the validation process, which will focus on the factor structure of the instrument itself and the relationships between the four approaches in this instrument (construct-related validity issues) by means of confirmatory factor analysis. The data from all 241 courses will be available at the end of September (so these results can be presented at the conference)) . Finally, correspondence analysis on the final version of the instrument will allow lecturers and educational boards to evaluate whether the instrument can be used to make a difference between courses that can be defined as either Research-tutored, Research-based, Research-led, or Research-oriented (or a combination).

Discussion and Conclusion

In the future, the University of Antwerp will use the questionnaire to examine various premises.

1. As students should develop scientific competences, learning activities from the four approaches have to be present throughout their education.
2. Learning activities in the four approaches should not necessarily be equally present in a programme.
3. The RT nexus is present (in some form or another) in every course of an academic programme .

Meanwhile, new pilot projects will be set up in other scientific fields, to verify how robust the instrument is in other contexts. We also plan to compare the lecturers' perception with the students' experience.

Literature

Brew, A. (2006). *Universities into the 21st century: Research and Training*. New York, NY: Palgrave Macmillan.

Elen, J., & Verburgh, A. (2008). *Bologna in European Research-Intensive Universities*. Antwerp, België: Garant.

Elsen, M., Visser-Wijnveen, G.J. & van Driel J.H. (2009). How to strengthen the connection between research and teaching in undergraduate university education. *Higher Education Quarterly, 63* (1), 64-85.

Jenkins, A., Healey, M. (2005). *Institutional strategies to link teaching and research*. York, UK: the Higher Education Academy.

Verburgh, A., Elen, J., Lindblom-Ylänne, S. (2007). Investigating the myth of the relationship between teaching and research in higher education: A review of empirical research. *Studies in Philosophy and Education, 26* (5), 449-465.