

## A knowledge model of the research-teaching nexus (0333)

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### **Abstract**

The nature of the relation between research and teaching continues to be debated in higher education. Several researchers have proposed models to describe the different ways in which research and teaching can be linked. This conceptual paper presents a new model on the research-teaching nexus based on earlier models by Healey (2005) and Wuetherick and Turner (2006), aiming to do justice to issues that have been raised by researchers and academic developers. The 'knowledge model' consists of two dimensions: knowledge transmission – knowledge production, with knowledge reproduction as the middle position, and research product - research process; resulting in six variants. First, the models of Healey (2005) and Wuetherick and Turner (2006) will be discussed, second, the new 'knowledge model' will be presented, providing a description and examples of each of its six variants.

### **Introduction**

The link between research and teaching has been a topic of ongoing interest in higher education (Malcolm, 2014). Several researchers tried to capture the various ways in which research and teaching can be connected, among others Healey (2005) and Wuetherick and Turner (2006). This paper presents a new model on the research-teaching nexus that incorporates these earlier models. Especially the model by Healey (2005) has been widely used. Nonetheless, the interpretation of this model has varied broadly. The knowledge model presented in this paper provides an answer to some of the issues of previous models by introducing the knowledge transmission – knowledge production dimension and ensuring that different types of activities are allocated in different variants.

### **The model by Healey (2005)**

Healey's (2005) model is well-known and much used. He organized the variants as described by Griffiths (2004) on two dimensions: 'focus on research products or on research process and problems' and 'students as participants or as audience' (Figure 1). Research-Led can be described as teaching research content; within Research-Oriented students learn about knowledge construction in the discipline. In Research-Based students undertake inquiry-based learning. Finally, in Research-Tutored the students write and discuss papers. Within the literature (and beyond) this model is debated. The question is raised whether the active participatory role of students implies that students develop new knowledge, as promoted by Elsen et al (2009). Furthermore, the question whether one quadrant would be more desirable than others is raised; generally, Research-Based is preferred over other quadrants (cf. Jiang & Roberts, 2011). Additionally, the allocation of modules in a quadrant partially depends on one's conceptions of research (cf. Neumann, 1993).

*Figure 1. Model by Healey (2005).*

### **The model by Wuetherick and Turner (2006)**

The lesser-known model by Wuetherick and Turner (2006) (Figure 2) is based on one dimension running from transmissive/teacher-focused to conceptual change/student-focused. The four categories are: research outcome transmitted, research process transmitted, students engage with outcomes, and students as researchers. Wuetherick (2010) later compares this model with Healey's (2005) model and states that 'Research outcomes transmitted' is comparable to Research-Led and 'Research process transmitted' to Research-Oriented. The Research-Based quadrant, however, seems to include different activities. He stresses the importance of differentiating between engaging students in research of which the outcomes are already known and having students conduct research themselves in which they gain new knowledge for the discipline (Wuetherick, 2010). Examples of 'engaging students in existing research' are activities based on the teacher's or department's research

and reviewing research articles. Problem or inquiry based teaching are also considered forms of engaging students in research that is not aimed at discovering new knowledge. 'Students as researchers' includes writing project dissertations and publishing research outcomes.

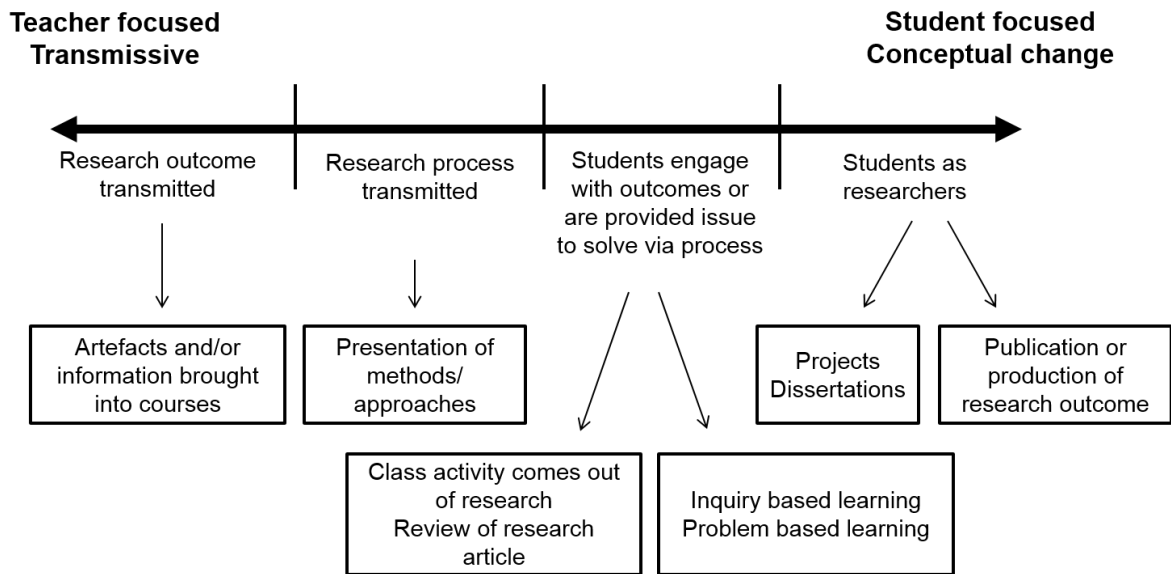


Figure 2. Model Wuetherick & Turner (2006)

### The knowledge model

The new model addresses the question about the role of knowledge, as raised when interpreting Healey's (2005) model, by distinguishing teaching in which knowledge is reproduced from teaching in which new knowledge is produced. Additionally, it addresses the concern that too many different activities are included in one quadrant (Research-Based) and it incorporates the different activities identified by Wuetherick and Turner (2006) in their own category.

The two dimensions of the 'knowledge model of the research-teaching nexus' are: knowledge transmission – knowledge production and research product – research process. Not all forms of teaching in which research has been integrated are focused on the development of new knowledge. Frequently it includes knowledge (or skills) new to the student, but not to the field of study. One of the dimensions, therefore, indicates whether the knowledge that is transmitted in teaching is new to the student (knowledge transmission), or that the knowledge that is (re)produced by the students is new to them (knowledge reproduction), or that the knowledge that is produced is new to the students and the teacher/field (knowledge production). The dimension research product – research process indicates the emphasis on the process or product, but is not exclusive. Particularly in variants closer to knowledge production, it is almost impossible to solely concentrate on either research products or research processes. The two dimensions result in six distinctive variants, presented in Figure 3 and discussed below.

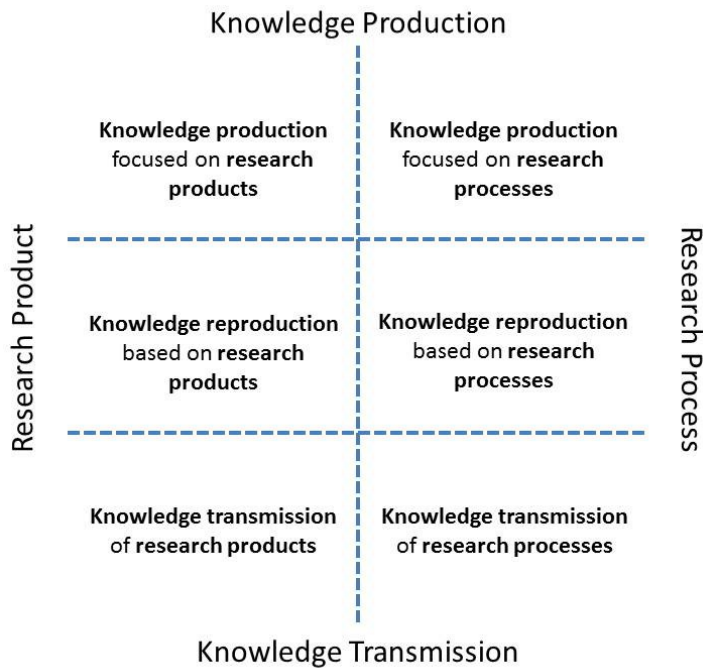


Figure 3. Knowledge model of the research-teaching nexus

### Six variants of the research-teaching nexus

*Transmission of research products:* Research products are used as the start of the learning process about a certain topic. Researchers use artefacts or research results to introduce students to research. Transmission is explicitly not defined as unidirectional, but may actively involve students.

*Transmission of research processes:* Teaching methods focused on developing research processes/skills. This could take many different forms, depending on the discipline; however, a common characteristic is that it aims at the transmission or training of necessary research skills.

*Knowledge reproduction based on research products:* Students work with existing research products or results. Debate and argumentation are important aspects in this variant as the students are asked to relate in one way or another to the research results.

*Knowledge reproduction based on research processes:* Learning takes place through a well-structured method based on research processes: i.e., the learning process starts with a clear question that will be answered in a systematic way. This includes inquiry or problem based learning.

*Knowledge production focused on research products:* Students participate in authentic research settings in which research products are shared, for example, conferences, or undertake reviews of research products and might share the results with the larger world.

*Knowledge production focused on research processes:* Participation in research processes means that students actively contribute to the knowledge production in the discipline, with a focus on the underlying research process. This includes (most) Undergraduate Research.

The knowledge model can be used to evaluate curricula that aim to strengthen the research-teaching nexus by allocating all modules in the six variants. Applying this model will give academic developers insight in where the emphasis lies in a programme and may lead to adaptations of the model.

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