Integrating Research and Teaching in the IS Classroom: Benefits for Teachers and Students

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ABSTRACT

Creating a link between research and teaching activities in higher education is a common and recurring challenge for many academics. Especially in practice-driven areas like Information Systems (IS), educators as well as students can benefit substantially from well-designed course curricula that facilitate research-driven learning processes. In this paper, we discuss the benefits and challenges of research-driven education from the perspective of both teachers and students and propose a research-driven course design in the case of a graduate course in IS development and implementation. The suggested approach includes a set of different techniques that allow for a successful integration of research content and activities throughout the whole course lifecycle. In order to validate our design empirically, we conduct a survey among course participants (n=194) and discuss the results. Our findings provide initial support for the proposed design, which can be the basis for future research and guide the composition of research-driven courses in the IS field.

Keywords: Curriculum design and development, Faculty effectiveness, IS major, Student research, Research-based learning

1. INTRODUCTION

The nexus between research and teaching has been drawing the attention of academics from a range of scientific fields. The ways in which research could enrich the learning experience has been extensively debated (Barnett, 2005; Brew, 2001, 2006; Jenkins et al., 2003; Kreber, 2006). Nevertheless, there is an overwhelming consensus among the academic community that such an instructional approach could have multiple benefits for both the educator and the student. Research from various disciplines has over time contributed to an extensive and ongoing discourse on this topic, ranging from motivational aspects of educators and students, to particular tools and methods that facilitate research-driven education. Arguably, creating an effective nexus between research and teaching in the classroom can be more challenging for rapidly changing domains. Information Systems (IS), being at the intersection of technology, business, and management, is greatly affected by the waves of scientific and technological innovation. This creates a twofold challenge for the IS academics that have to play both the roles of researchers and educators.

First, similar to many other domains, teaching in IS has been affected by emerging and innovative pedagogies. Technological and instructional advancements have contributed greatly to the development of new types of education in formal (e.g., universities), informal (e.g., open courses), and non-formal (e.g., social networks) settings (Schroeder et al., 2010). Massive open online courses (MOOCs) that extend the typical classroom to a wide audience (Saadatdoost et al., 2015) and flipped classroom approaches that deliver the instructional material outside the classroom hours (Mok, 2014) are only two examples that have spread across the educational landscape recently. Similarly, service-learning approaches provide the opportunity for the students to apply their knowledge in real-world settings (Lee, 2012). The rise of social media has also affected learning and gave birth to a new category of learning paradigms. McLoughlin and Alam (2014) explore the potential of Pedagogy 2.0 in scaffolding students in Social Informatics. IS educators, bound by the nature of their

field, have to stay on top of these developments, while ensuring the quality of student learning.

Second, in relation to IS curricula, the rise of the digital society, characterized by ubiquitous connectedness and new forms of technological interaction, often pushes the boundaries of established IS teaching plans (Dreher et al., 2009; Harris and Rea, 2009). Working in academic environments in which resources (structural, organizational, financial, etc.) are often limited, IS educators experience the need to carefully design curricula including both introductory domain knowledge as well as recent research breakthroughs. Moreover, as digital innovations follow a more rapid, often disruptive pattern, IS educators face increased risks of falling behind current advancements (Fichman et al., 2014, Obwegeser and Bauer, 2016). The potential benefits of integrating research activities and findings into higher education courses is increasingly attracting the attention of academics. In this paper, we aim to build on this growing volume of literature in order to inform the research-driven design of IS education. Doing so holds the promise to support both aforementioned challenges, by integration of contemporary research outputs to stay connected with on-going developments, as well as by active engagement and discussion of research processes and problems.

The remainder of this article is structured as follows. First, we introduce the reader to the state-of-the-art of the ongoing scientific debate on the link between research and teaching in higher education. Second, in order to apply the theoretical approach into practice, we present a case study of a graduate IS course to propose a course design that integrates teaching and research to a high degree. Third, we present empirical results to validate the proposed course design and discuss its benefits and limitations. Finally, we conclude the article and point to future research areas.

2. THE RELATIONSHIP OF RESEARCH AND TEACHING IN HIGHER EDUCATION

Scholarly interest into how to integrate research into teaching has gained momentum recently, with a steady increase of related literature in the field (e.g., Barnett, 2005; Brew, 2001, 2006; Jenkins et al., 2003; Kreber, 2006). The issue of the research-teaching nexus is multifaceted, as it affects several aspects of higher education, but also relates in many ways to policy making, pedagogy, academic teaching, and research. Eventually, it can be traced back to the philosophical question of how we as a society understand the role of academia, or the "university." While this question has been discussed for quite some time – most notably by Aristotle and Humboldt – a unified understanding is yet to be established. As such, the literature on how this nexus should be conceptualized and implemented holds diverging and, at times, conflicting views.

Although we focus our attention in this paper on the academic consensus that bringing research and teaching together offers significant benefits for the students, it is important to note that balancing research and teaching is not always an easy journey for the teacher. For example, while reviewing the literature, Hattie and Marsh (1996) and Marsh and Hattie (2002) found no significant correlation between research output and teaching performance. On the contrary, in several of the studies they examined, there was a negative correlation between the time spent on teaching and research publication output.

In addition, Healey and Jenkins (2003) noted that the domain in which the research-teaching nexus is being established is an important mediator of success, since research and teaching may vary significantly between domains. Similarly, Robertson and Bond (2001) point out that "in disciplines where there is a large body of technical knowledge organised hierarchically and being taught in huge lecture theatres […] a relationship [between research and teaching] is difficult to sustain or nurture" (p.15). Their description of challenging disciplines fits well with many common IS courses. As mentioned earlier, IS lays in the intersection of technology, business, and management, absorbing and filtering innovations and developments that come from different directions. Although much of the IS domain landscape falls under the "well-structured" domain paradigm, applying IS knowledge into practice is a typical example of an "ill-structured" domain (Bernroider et al, 2011). Spiro et al. (1992), Feltovich et al. (1997), and Spiro et al. (2003) define the ill-structured domains as fields with high complexity, concept interconnectedness, and across-case irregularity. Such domains require instructional approaches that would help students deal with complexity and irregularity. Arguably, most of these instructional approaches are based on constructivism, putting the learner at the center, and focusing on active engagement, situated cognition, and ownership of learning (Jonassen, 1999; Schank et al., 1999). We maintain that such instructional goals can be easily visualized if we place the student in the seat of a researcher.

From a pedagogical point of view, as Jenkins (2004) states, "there is clear evidence from a range of studies in different types of institutions of the students valuing learning in a research based environment" (p. 29). Research and teaching can thus be viewed as mutually reinforcing learning processes (Brew, 2002, 2003). Becker and Kennedy (2005) considered imparting knowledge (teaching) and creating knowledge (research) as complementary activities. There are a growing number of academics who find that students gain learning benefits when they are taught by active researchers and are engaged directly in research activities (e.g., Healey, 2005; Jenkins et al., 2003; Lee, 2004).

Based on the above, our focus in this paper is not on the debate whether or not the research-teaching nexus should be formally established in higher education, but on how to help the IS educator in establishing this link through different approaches that would provide learning gains for the students. The ways in which research and teaching can be linked together is an interesting topic of discussion amongst academics, especially since each implementation of the research-teaching nexus is expected to offer different learning benefits to the students. Several studies have shown that students gain more from the integration of research in their classes when they participate in activities that allow them to develop their research skills (Brew, 1999; Elton, 2001; Healey, 2005). The learning design of providing students with research opportunities in their classes is often founded on the paradigm of inquiry-based learning (De Jong, 2006; Elton, 2001; Healey, 2005;). Through a wider lens, engaging students into research activities is a type of

problem-solving anchored into a real-life context (Coombs and Elden, 2004; Savery and Duffy, 1995). As such, following the constructivist line of thought (Jonassen, 1999), we argue that student-researchers have more opportunities to develop critical thinking, ownership of learning, and problem-solving skills. Through research activities, students are required to understand the domain landscape, formulate valid research questions, establish paths to gather evidence, and evaluate the degree this evidence sheds light on the issue. In addition, integrating research into teaching can foster interdisciplinarity and encourage collaboration between students and between students and teachers (Le Heron, Baker, and McEwen, 2006). The benefits of linking research and teaching inside the classroom are also visible to the students. Focusing on the students' perspective, Healey et al. (2010) reported that students felt that having an active researcher as a teacher helped them to better understand the domain, adding that it also stimulated their interest and enthusiasm for the subject. Moreover, students' association of research-active teachers with up-to-date knowledge is equally important (Healey et al., 2010).

There are, as mentioned, several shades of combining research with teaching, with academic discussion going a step further analyzing both the concepts of "teaching" and "research" in different contexts (Healey, 2005). Griffiths (2004), for example proposes a distinction of research types based on the subject areas, linking empirical science to Science, interpretative investigation to Humanities and Social Sciences, and applied inquiry to vocational fields. In addition, Barnett (2005) distinguishes between (a) the use of current or past research into the syllabus and (b) research that was conducted by the teachers themselves or by colleagues in the same or other institutions.

In this paper, we base our course design and analysis on the works of Griffiths (2004) and Healey (2005), suggesting a widely accepted model on the four ways the research-teaching nexus can be implemented in a course (Figure 1).

Healey et al. (2010) describe the role of students and the role of research in the course as follows (p. 237):

- *Research-led*: where students learn about research findings, the curriculum content is dominated by faculty research interests, and information transmission is the main teaching mode.
- *Research-oriented*: where students learn about research processes, the curriculum emphasizes as much the processes by which knowledge is produced as learning knowledge that has been achieved, and faculty try to engender a research ethos through their teaching.
- *Research-based*: where students learn as researchers, the curriculum is largely designed around inquiry-based activities, and the division of roles between teacher and student is minimized.
- *Research tutored*: where students learn in small group discussions with a teacher about research findings.

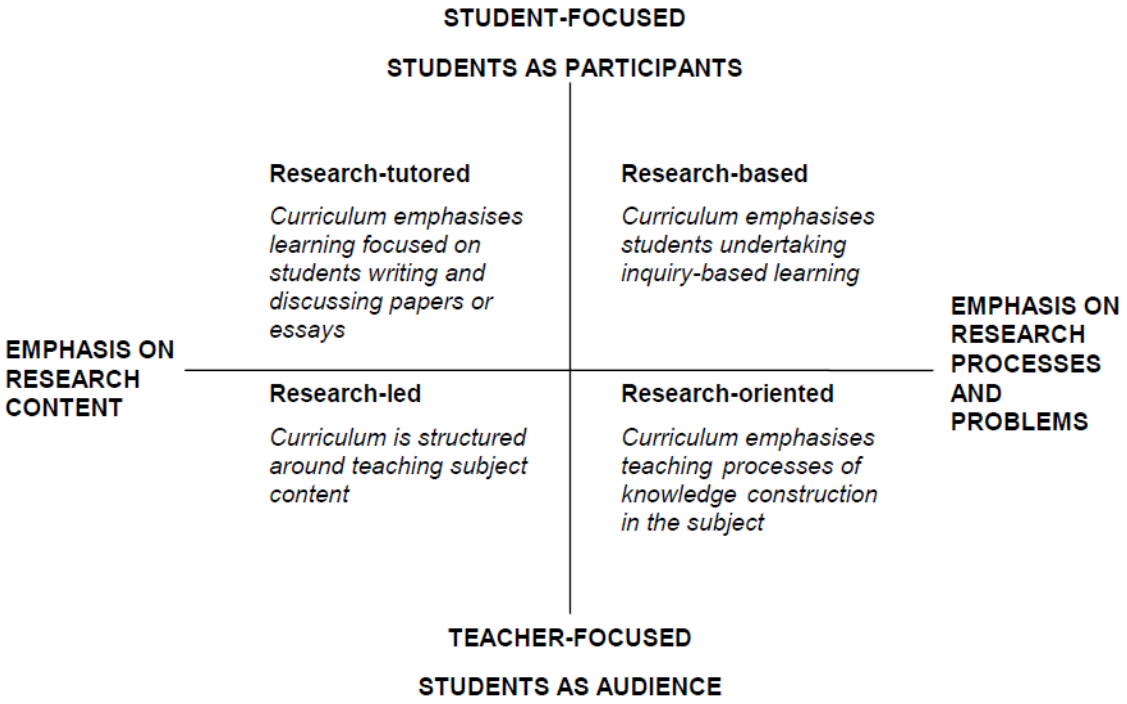

Figure 1: Curriculum Design and the Tesearch-Teaching Nexus (Healey, 2005)

As Healey (2005) states, only a few curricula fit entirely in one quadrant, with most traditional modes of teaching taking place in the Research-led quadrant. However, in order to account for the differences among students, the role of the discipline in which the research-teaching nexus is implemented, and the type of content that changes throughout the course, it is common to have curricula that would cover more than one quadrant based on the intended learning goals and competences. Specifically for our case, the course design is purposefully designed to cover a wide area of different techniques since students are engaged in activities that can be linked to all four quadrants.

3. CASE STUDY DESIGN

We use the case of a real course called "Information Systems Development and Implementation in a Business Context" (ISDI) to apply our theoretical approach into practice. In this section, we present the course background and environment followed by the proposition of an adapted course design and curriculum aimed to allow for a successful integration of research into the teaching domain.

3.1 Course Format and Curriculum

ISDI is a 10 ECTS (European Commission, 2016) course that runs over 11 weeks with a total of 120 teaching hours. The course language is English, including all teaching, assignment, and examinations. The course generally attracts somewhere between 50 and 100 students and is offered once per year in the fall semester.

3.2 Course Content and Intended Learning Outcomes

The aim of ISDI is to give students an understanding of the diverse challenges, risks, and complexities of developing and/or implementing IS in organizational environments. The course is not a technical course, i.e., students are not required to have any knowledge about topics like software development or database design, but rather takes a project management perspective and addresses the special aspects of IS projects. As part of the course, a number of core IS theories, methods, and techniques are introduced that can help to understand, plan, and execute the processes in which information systems are developed, implemented, and maintained.

The course consists of two major parts: development and implementation. In the development part, the course focuses on the difference between traditional (plan-based) and agile development methods, as well as on issues like contingency methods, method tailoring, and ambidexterity. To discuss these topics, the course includes the discussion of widespread ISD methods, such as the waterfall method, the rational unified process (RUP), SCRUM, or eXtreme Programming (XP). In the implementation part, the course focuses on organizational change and discusses general frameworks and topics such as Actor-Network Theory (ANT), trust and control, and configuration in the context of IS implementation projects. Both parts of the course are aligned tightly and pursue the goal of discussing several different perspectives related to the overall topic of management and use of IS in organizations. The intended learning outcomes are stated in the course description as follows:

After successful completion of the course, the students will be able to:

- Describe and analyze challenges of IS development, acquisition, and implementation in business based on theory covered by the course.
- Describe, analyze, evaluate, and reflect upon IS development and implementation practice applying the theoretical frameworks of the course.
- Evaluate and compare different IS development and implementation methods based on lifecycle models and other frameworks of the course.

3.3 Context and Environment

Students that participate in the course usually have various backgrounds and prior education. Many attendants (approximately 50%) take the course as a mandatory part of the study program "Information Management" (IM) which is a graduate degree program focusing predominantly on topics related to the "management of information resources and information technology (IT)." ISDI is one of the first courses offered to IM degree students, with "Introduction to IS – Management" and "Organizational Theory" running before or in parallel.

The second largest group of students (approximately 30%) is studying in the graduate program "Business Intelligence" (BI) which focuses on teaching the "concepts and methods to improve business decision making by using fact-based support systems." ISDI is a mandatory part of the first semester of the BI program alongside other courses such as "Data Warehousing," "SAS and SQL," and "Applied Econometric Methods."

Third, around 10 to 20% of students are either local students from other programs or faculties (including computer science and the humanities) taking ISDI as an elective, or incoming international students from various European and Non-European countries with different study backgrounds.

3.4 Integration of Research and Teaching in ISDI

We follow the proposed dimensions by Griffiths (2004) that was further developed by Healey (2005) to help us include a research perspective in the ISDI course design. As a guiding principle for the use of Healey's (2005) framework, we argue that a course design should make use of the variety of different tools and techniques, when appropriate, for different aspects of the course. This is especially important for long and broad courses such as ISDI that cover a wide range of topics over an extended period of time. Moreover, prior research suggests that a combination of different teaching/learning methods is helpful to address diverse student audiences, often comprising different cognitive learning styles (Cegielski, Hazen, and Rainer, 2011). Thus, we have dissected our course curriculum into logical parts and decided based on topics and/or other factors which of Healey's (2005) categories and related activities would be most useful for each part. In the following, we present the methods applied in the course and describe the intended outcome.

3.4.1 Research-led activities: To address this category, the teachers present their own research activities, often in the form of distribution of publications or working papers with additional presentation of anecdotal evidence and rich, personal experience. The underlying rationale of such activities is that research carried out by the teachers themselves can be presented in a more tangible and involved way then just reiterating somebody else's publication. An example of this is the presentation of a rich longitudinal study on trust during IS implementation in healthcare done by one of the instructors, which sets the agenda for further learning activities on the topic.

3.4.2 Research-tutored activities: In this category, we use case-studies and tutorial sessions to facilitate the active engagement of students with research outcomes and publications. Students, working in groups of two to four, are given a publication on a specific topic – e.g., the concept of agility Conboy (2009) – and asked to critically engage with the topic. To do so, students are given a few, relatively open guidance questions (e.g., *Is the research design appropriate to answer the specific research questions/objectives?* or *How does this topic/concept relate to other topics within ISDI?*) and asked to prepare a 1-hour presentation and discussion session in front of their peers.

3.4.3 Research-oriented activities: Since most participants take the course as part of their first semester graduate programs, students have little or no prior knowledge about research and/or knowledge creation processes. To better understand the particularities of IS research, the students are asked to critically reflect and discuss the research design and methods of seminal IS papers. This way, students come into contact with predominant research design within IS (e.g., variance based research models or case studies) (Benbasat, Goldstein, and Mead, 1987; Gregor, 2006). Moreover, the students are provided with learning material on IS research methods, theories, and a 4-hour tutorial discussing the need for appropriate research designs.

3.4.4 Research-based activities: The final exam of the course is conducted orally in a form similar to a thesis defense based on a group report that students are required to hand-in one month before. The group report has a length of 15 pages per student and requires the students to conduct an independent research project related to the topics of the ISDI course. The timeframe for this assignment is approximately 8 weeks. The choice of topic and research design is free within the range of IS development and implementation. The large majority, around 85% of the groups, decide to do an empirical case study on ISD topics within local companies. That includes establishing contact with the company, gaining access to relevant information (e.g., in the form of interviews, documents, or observations), as well as analysis and discussion of their findings. Around 15% of the groups decide to conduct a literature-based study, i.e., reviewing and synthesizing a specific topic related to the course. Students are given a limited amount of supervision (1-hour per group) to discuss their research questions and designs, but are largely required to make decisions independently within their groups**.**

4. EMPIRICAL VALIDATION

We were particularly interested in student feedback to find evidence for the effectiveness or limitations of our proposed course design. As part of the university's policy, all courses are subject to a standardized evaluation scheme that students are required to complete after or during the last lecture. Due to the rigidity and limited flexibility of the standardized evaluation form, we collected additional data for the purpose of particularly measuring the research integration techniques implemented in the course. In the following, we will give a short overview of the general course feedback received first and then introduce the design and results of the survey developed specifically for this project.

4.1 General Course Feedback

Since the standardized evaluation process of the university has been subject to change over the last years, we can only present data from 2015. However, we can expect some transferability of results to the previous years as the course design has not changed. The feedback process is based on an online survey comprising both closed and open questions regarding the core aspects of the course, including course design, learning process, as well as student and teacher performance. Student participation in the feedback process is voluntary and resulted in 27 (of 86) responses in 2015.

In relation to the various forms of research integration, some responses to open questions were particularly relevant. Being asked to formulate "Which parts of the course have been particularly beneficial for your learning?" a number of students pointed to the group-work elements of the course. In particular, they mentioned the need to critically assess research content and present it in front of their fellow students (research-tutored), as well as the requirement to engage in their own research processes (writing a group report) to generate new knowledge in the field (research-based). Interestingly, some students made negative remarks about the presentations of their fellow students regarding their quality, while others asked for more such activities. Moreover, some students found the number of different topics covered in the course too broad and therefore overwhelming.

4.2 Survey Design

To empirically validate the effectiveness of research integration in the new course design, we chose to conduct an online survey among students that had participated in the ISDI course after its redesign. The course was taught three times during the last three academic years with a total number of n=194 participants (48+60+86).

It is important to point out that the survey targeted to measure the breadth of different techniques and methods employed to make the course more research driven. That is, we were not aiming to elicit the students' perception of which of the four categories the course follows predominantly. In terms of survey design, this resulted in the development of two independent items for each of Healey's (2005) four categories.

Construct	Code	Items
Research-led	Q1	The teacher presents content based on scientific publications (e.g., journal and/or conference articles).
	Q2	The topics presented focus on current research issues/areas.
Research-oriented	Q3	The course curriculum includes different research methods of the domain.
	Q4	Students learn how to conduct research in Information Systems, as part of the course.
Research-based	Q5	Students are required to explore course topics through their own research.
	Q6	The curriculum includes new knowledge creation in the form of research activities.
Research-tutored	Q7	Students are encouraged to engage critically with the scientific publications used in the course.
	Q8	Student activities include presentations and discussion of scientific publications.

Table 2: Overview of Survey Constructs and Items

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
4.49 (0.53)	3.76 (0.83)	3.96 (0.88)	3.68 (1.09)	4.31 (0.64)	3.86 (0.84)	3.82 (0.92)	4.35 (0.76)
Research-led		**Research-oriented**		**Research-based**		**Research-tutored**	
4.13 (0.79)		3.82 (1.00)		4.09 (0.78)		4.09 (0.89)	

Table 1: Overview of Survey Questions and Average Response (Including Standard Deviation)

To measure the single most-predominant design of a course, a continuous scale along the same dimension (e.g., student as passive versus student as active audience) will be more appropriate.

A full overview of the constructs and items used is given in Table 1. The survey was conducted via an online form. The order of questions was randomized for each student, while attendants were solicited via direct email from the course instructor. No credits or other form of reward were given.

Participants were asked to indicate their level of agreement to each statement independently on a 5-point Likert scale ranging from 1 – "Strongly disagree" to 5 – "Strongly agree," while "Neutral" (3) indications were also allowed.

4.3 Survey Results

We received a total of 54 complete responses. This translates to a response rate of 28%. More than half of the respondents attended the course in 2015, and around one quarter in 2014 and 2013, respectively. Studies taking place in university context are often prone to certain types of response biases (e.g., acquiescence bias or social desirability bias). However, we expect the fact that the course(s) were finished and graded and no relationship of dependence between the instructor/researcher and the participants was given at the time of the survey to be moderating factors for any potential bias. Table 2 shows the mean results per question (standard deviation in parentheses) as well as the means per category.

To better visualize the results of our survey, we plotted the mean result per question, category, and dimension (active versus passive teaching, and research content versus research process) onto the matrix proposed in Healey (2005) (Figure 2). The radar plot uses the same scale (1-5) as the survey questions.

For each quadrant of the matrix, the average of the category (two items each) was calculated. Horizontally, we used the average of Q(1,2,7,8) to indicate the perceived degree of content-based teaching and the average of Q(3,4,5,6) to depict the degree to which research- and knowledge-generation processes were discussed.

Vertically, the average of Q(5,6,7,8) shows the degree of active student involvement, while the average of Q(1,2,3,4) depicts activities with students as passive audience.

The survey result analysis shows that our course design scored high (average scores around 4) in all four categories. This suggests that, based on students' perspective, our aim for the course design, not aiming for one particular category, but rather for a broad and diverse combination across categories of research-integration, was indeed successful.

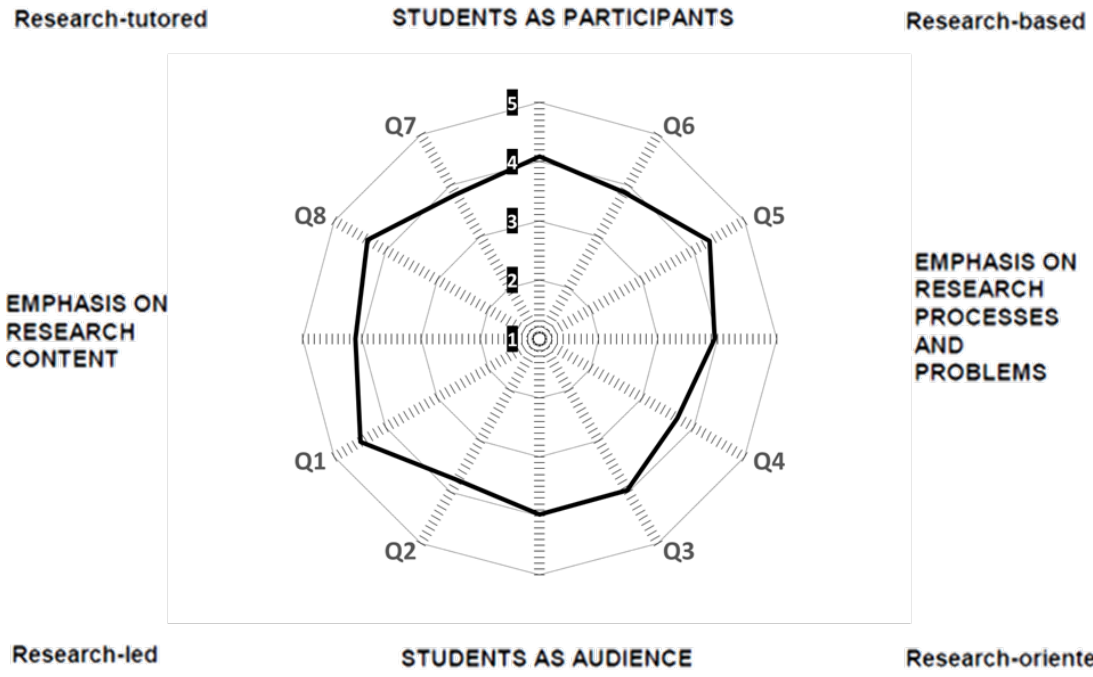

Figure 2: Survey Results Plotted on Categorization Scheme as Proposed by Healey (2005)

4.4 Instructor Feedback

To understand and evaluate the implications of research-teaching integration from the perspective of the instructors, we have conducted open interviews and gathered informal feedback from the two instructors that jointly lectured ISDI throughout the last three years. Since one of the co-authors of this paper is also part of the instructor team, the other (non-involved) co-author collected and analysed the instructor feedback to reduce any potential bias. The instructors evaluated the course design as highly positive in relation to research-teaching integration, and mentioned in particular the increased intrinsic motivation of the instructor when presenting or discussing their own work of research. One of the researchers noted that due to the in-depth discussion of their work, often new research ideas are evolving as a spill over-effect of the course. Both researchers, however, agreed on the increased amount of time and effort that is necessary in order to design, control, and evaluate the various activities properly, especially with regard to the main research-based activity in the form of a 15 page report. For students to benefit from this activity, course designers are required to invest a considerable amount of time into feedback and supervision activities. One instructor mentioned the integration of peer-activities among students in future revisions of the course to lighten this burden. From the perspective of educators, both instructors positively acknowledged the pay-offs in the form of motivation and increased work satisfaction.

5. DISCUSSION

Our results show that our approach to offer complementary learning activities that would enhance the research-teaching nexus was well-received by students and instructors. We maintain that it is especially important for large and diverse courses that focus on various areas of a domain to include variations in course design. More specialized courses (e.g., "Philosophy of research" or "Database design") will likely be easier to categorize in one specific category (Steenkamp and McCord, 2007). The variations in the course design and the range of research-related activities could better accommodate the learning needs of the participants related to personal traits and learning styles.

The survey result analysis shows that the four different research-teaching links of the proposed course design were clearly identified in the course by the students, as confirmed by the relatively high scores in all areas. In the open-ended course evaluation report of 2015, students explicitly mentioned the research-tutored aspect of the course, mentioning research critique and discussion of research findings with their peers. Furthermore, students appeared appreciative of research-based activities that engage them in conducting their own research activities.

As such, our argument is that aligning research-integration with both content and teaching/learning style could be beneficial for students and instructors at the same time. Of course, a fit between the type of research-integration and the content of the specific lecture has to be found to support an optimal learning environment. Moreover, the resource situation of the instructors has to be taken into consideration when planning supervision-intense, research-based activities.

As prior research in Information Systems education found, moving from a teacher-centred to a learner-centred paradigm can be beneficial for both student learning experience and appropriateness of assessment methods

(Saulnier et al., 2008). In our course, assessment was based on a research-based approach, requiring the students to engage in their own research by writing a report on an actual research problem, which was then part of their assessment. By using this research-teaching link, the students were given a high degree of freedom in designing their own learning experience and additionally encouraged to engage actively with the topics of the course.

6. CONCLUSION

The integration of research and teaching in IS education holds great benefits, both from student's and teacher's perspectives. In our course, we have followed a well-known and widely used categorization of the research-teaching nexus (Healey, 2005). We presented a case study of a graduate course on IS development and implementation to translate the theoretical discussion into practical application and propose a new course design with various elements of research integration. Specifically, we designed the course to include elements of all categories, along the dimensions of active versus passive audience, and emphasis on teaching research outcomes (content) or research processes and problems.

This paper contributes to the ongoing debate on research-teaching integration, particularly in the field of Information Systems. We reviewed extant literature and proposed a systematic approach on how to implement the research-teaching nexus in IS courses. The methods proposed include a variety of research-teaching links that are complementary in nature and aim at supporting students with varied backgrounds and learning styles. Empirical data confirms the effectiveness of our proposed design.

Of course, there are certain limitations that need to be mentioned. First, as the debate on research-teaching integration is taking place in various domains and based on different underlying theoretical paradigms, our research is limited to the field of Information Systems and does not necessarily apply to other domains. This is in line with previous researchers who found that successful relationships between research and teaching depend on the field/discipline and student level (Coate, Barnett, and Williams, 2001; Jenkins et al., 2003). Second, the empirical part of our study is following a single case study design. Thus, we are limited to analytical generalization within similar contexts and cannot draw on inferences from statistical sampling (Yin, 2009). Third, our study relies on self-reported data from students and teachers and is therefore limited with regard to objectivity.

While our contribution makes a first step towards practical design propositions for teachers, we acknowledge that the limitations in domain and context boundaries call for further research. Specifically, we think that the practical field would benefit from more single and multiple case studies, within and across domains, in order to generate a rich theoretical base. To expand our understanding, we encourage researchers to develop standardized and objective measures into the potential benefits of research-teaching integration. More insights into course design principles are needed in order to provide situation and context specific guidelines, not only at course and/or domain level, but also at the level of individual learning styles and activities.

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