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How do lecturers conceptualise pedagogical innovations in higher education?

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Abstract

The aim of this study is to understand how lecturers interpret pedagogical innovations when describing and thinking about their practices. In this study we analysed the project proposals of a large call for proposals in a French university and questioned the managers of funded projects about their conceptions of pedagogical innovations. Results show little theoretical guidance in designing innovations suggesting that practical objectives are the more important. Projects can be underpinned by one or more theoretical views; the most represented theoretical view was constructivism.

Pedagogical innovations in higher education

Nowadays, French universities experience growing pressure mostly due to a substantial increase in the number of students. This leads them to implement courses that must be taught in an identical manner when taught to different subgroups of students in the same curriculum (Bertrand & Bonnafoous, 2014). Teaching in the form of lectures, based on transmissive and passive learning, with limited in-class interactions is the most convenient ways to address large numbers of people (French & Kennedy, 2017; Land and Jonassen, 2012). However, research shows that learning in interactive environments, in which students are actively involved in a domain but still guided by their teacher, may lead to better and deeper knowledge (for meta-analysis see Alfieri et al., 2011). Thus, in recent years, lecturers are encouraged to experiment pedagogical innovations for transforming higher education (Hannan & Silver, 2000) and policies for encouraging and financing these innovations are increasing (Dulbecco et al., 2018). Mostly, the development of pedagogical innovation in France is encouraged in a top-down manner, either by the institutions or by national or international programs like Education's Initiatives of Excellence.

Lecturer conceptions of teaching and learning in higher education

Lecturers, encouraged to use these pedagogical innovations, may hold different pedagogical conceptions about learners, the classroom and the teacher's role (Pajares, 1992). These conceptions can be broadly categorised into four theoretical views distinguished in the literature (see for example in Schuh & Barab, 2008): behaviourism, cognitivism, constructivism, socio-constructivism. Pedagogical conceptions typically range from teacher-centred and directive to student-centred and unguided (Deng, Chai, Tsai, & Lee, 2014; Trigwell & Prosser, 1996). The first set of conceptions is characterized by the centrality of the teacher, who imparts well-structured information to students as passive learners (Kember, 1997). Their theoretical foundations are associated with behaviourism and cognitivism. Instead, the latter set of conceptions aims at creating learning environments in which students can express themselves and experiment freely playing an active role. Their theoretical foundations are associated with constructivism and socio-constructivism. In the following, we use the terms transmissive and innovative to designate the two sets.

The pedagogical conceptions of lecturers may strongly influence their teaching practices (Samuelowicz & Bain, 2001; Samuelowicz & Bain, 1992; Evans & Kozhevnikova, 2011). Thus, different pedagogical conceptions may lead to different teaching methods (De Hei et al., 2015), or even to different conceptions of pedagogical innovations (Bain & McNaught, 2006). Depending on their pedagogical conceptions, lecturers may use pedagogical innovations both to increase student autonomy, to encourage cooperative work, or still to maintain transmissive learning methods.

In sum, a particular pedagogical innovation can be used to target different types of learning: both more and less directive (De Vries, 2001). Digital pedagogical platforms can be used to encourage learning by doing by providing simulations, video games, or software for collaboration (CSCL). However, these platforms can also be used for transmissive teaching and learning through electronic whiteboards, slideshows, and or online exercises (De Vries, 2001, Hannan & Silver, 2000).

The current study

In the last few years, there is a strong pressure in France to use pedagogical innovations in higher education. However, the word "pedagogical innovation" can cover very different realities, referring to the introduction of new technical teaching devices (e.g., the use of digital tools) and new teaching methods (e.g., the use of problem-based learning), but also to the ideologies of involved lecturers (Béchar, 2005). Indeed, innovations may depend on different theoretical views, which often remain implicit. How do lecturers and practitioners conceptualize pedagogical innovation in higher education? How do lecturers interpret the request for innovation? Do they see pedagogical innovations as an opportunity for increasing learner autonomy and decreasing teacher guidance? More precisely, we aim

to study how lecturers conceptualise pedagogical innovations and whether they connect the proposed pedagogical innovations to the four theoretical views mentioned above (Schuh & Barab, 2008).

Method

Two approaches were used to identify the theoretical views of pedagogical innovations: a content analysis of project proposals for a major call for projects and a questionnaire amongst project managers of funded projects about their conceptions of pedagogical innovations.

Context

We conducted this study in a naturalistic setting: a large call for projects in a French university. This call aimed at encouraging "Learning by Doing" through the funding of pedagogical innovations and platforms at all levels (from bachelor to doctorate) and in all disciplines. A total of 114 pedagogical innovations out of a total of 175 submitted project proposals were funded in a three-year span (2016-2018). Funded pedagogical innovations refer to both technological innovations (e.g., Massive Open Online Courses (MOOC), online exercise programs...) and innovative teaching methods (e.g., use of the flipped classroom, problem-based learning...). The project proposals to respond to the call for projects that encouraged "Learning by doing", written by teachers, teacher-researchers, or practitioners constitute the main materials of this first part of our study. Eight project proposals projects lacked a nature and objectives section. We therefore analysed 106 project proposals. We also distributed a questionnaire amongst the project leaders and participants.

Content analysis

The method used here is based on the principles of content analysis (Chi, 1997; Cohen et al., 2007). Amongst four sections: 1. Context and needs, 2. Aims and nature of the project, 3. Presentation of the target audience, 4. Project planning., Section 2. "Aims and nature of the project" was selected for analysis. First, we segmented the text to identify the units of analysis. Thus, based on punctuation, we segmented the " Aims and nature of the project " paragraph of each project into meaningful units (i.e. statements).

Analysis grid

An analysis grid was developed containing four theoretical views: behaviourism, cognitivism, constructivism and socio-constructivism (see Table 1).

Coding and categorizing

Two independent coders categorized each unit as relevant or irrelevant for approaches to teaching and learning. Statements referring to teaching methods or learning objectives were considered as relevant (e.g.: "This project is part of the pedagogical transformations axis and aims to place students in an active and autonomous posture of seeking innovative solutions to a societal problem"). In contrast, statements that did not express teaching methods or learning objectives were considered irrelevant, (e.g.: "Important

means are implemented for the realization of this training"). The relevant units were attributed to one of the four theoretical views using the analysis grid: behaviourism, cognitivism, constructivism and socio-constructivism (see Table 1). Thus, at the end of this process, each statement was categorized into only one theoretical view. Because the "Aims and nature of the project" paragraph contain several statements coded independently of each other, a single project could relate to a single theoretical view (100% within a theoretical view) or to several theoretical views. Coding discussions occurred between the two coders after 10% and again after completion of the coding process. The statistical index calculated to test the agreement between the two coders at the end of the process shows excellent agreement (Cohen's Kappa for theoretical view = .98).

Research-based practice

According to the concept of the reflective practitioner developed by Schön (1994), the practitioner is the knowledge developed about his/her actions. Amongst this knowledge is theoretical knowledge, which makes it possible to support proposals for action. These explicit theoretical references constitute the first level of conceptions that lectures have of their own approach to educational innovation. We counted theoretical references cited in each project proposal in order to gauge whether project leaders supported their innovations with theoretical work.

Questionnaire

We developed a questionnaire in order to provide the opportunity for lecturers and project leaders to express theoretical views of their project. 39 project leaders of the funded pedagogical innovations filled out the questionnaire during a two-day meeting organized by the university. The questionnaire referred to the funded project and contained specific questions (e.g. regarding the implementation time of your project, was the initial schedule respected?). In addition, for several statements, participants were asked to indicate whether they apply to teaching and learning as imagined in the project. For each statement, participants could answer on a scale ranging from 1 (strongly disagree) to 6 (strongly agree). The scale contained 16 statements: four statements referred to constructivism (e.g. "Do students learn through teacher-guided experiences?"), four statements referred to socio-constructivism (e.g. "Should students collaborate together to improve learning?"), four statements referred to cognitivism (e.g. "Do students need to memorise multiple information to succeed in the course?"), and four statements referred to behaviourism (e.g. "Do students learn by repeated exercises?").

Results

Degree of theoretical foundation

First, to study theoretical views on pedagogical innovations, we counted how many sentences were present in "Aims and nature of the project" paragraph and how many were relevant to identify approaches to teaching and learning. On average this paragraph was composed of 26.6 sentences (Table 2). However, as can be seen in Table 2, there was a large variability between project proposals, with at least one project consisting of 4 sentences and at least one project consisting of 73 sentences. Moreover, on average, the paragraph contained 33% of the sentences relevant for approaches to teaching and learning. Even here, there was a great variability depending on the project: there were two projects with no relevant sentences and one project with 80% of relevant sentences, i.e. that concerned theoretical views on teaching and learning with pedagogical innovations.

Because each "Aims and nature of the project" paragraph contains several statements coded independently of each other, a single project could relate to a single theoretical view (100% within a theoretical view) or to several theoretical views. In this latter case, projects may have a major view (largest view > 50%) and a minor view (second largest view > 25%). Projects without a major view (no largest view > 50%) were labelled "eclectic" and those with a major but without a minor view were labelled "No minor view". All four views on teaching and learning were present and could be predominantly characterized as constructivist (46%), socio-constructivist (27%), cognitivist (22%) and behaviourist (5%) (see Table 4). As expected, the most represented theoretical views were less directive (constructivist and socio-constructivist). However, more transmissive and more directive theoretical views (cognitivist and behaviourist) were also present in these project proposals, funded by a call for project encouraging pedagogical transformation and learning by doing.

Table 3 shows the coloration of the 106 founded projects in terms of their major and minor views. Some projects were mono-theoretical: 17 projects were 100 % constructivist, 5 projects were 100 % socio-constructivist, 5 projects were 100 % cognitivist, and we have no purely behaviourist projects. Some projects had one primary and one secondary theoretical view; for example, 19 projects were predominantly constructivist but also socio-constructivist, 9 projects were predominantly constructivist but also cognitivist and 2 projects were predominantly constructivist but also behaviourist. In the same row of the table, we can see 7 projects with a main constructivist foundation and a mix of other foundations. Finally, 14 projects had no main theoretical foundation and 1 project did not mention teaching or learning at all in the objectives.

Finally, our analysis showed that only 15% of the projects proposals present at least one theoretical bibliographic reference related to teaching and learning in the paragraph "Aims and nature of the project". These references mainly referred to the effectiveness of some active pedagogy (e.g. Etkina

2010; Freeman et al., 2014). Thus, at first glance, project proposals seemed to focus more on practical efficiency needs and student satisfaction, than on theoretical work in educational science.

Questionnaire

To study the theoretical views of lecturers and project leaders more precisely, we conducted the analyses of 39 questionnaires investigating about conceptions of pedagogical innovations. Our analysis showed that project leaders mostly consider projects as constructivist ($M= 5.39$; $SD=.96$), then cognitivist ($M= 4.15$; $SD=1.04$), then socio-constructivist ($M= 4.13$; $SD=1.49$) and finally behaviourist ($M= 3.61$; $SD=1.39$) (See *Table 4*). These results were very similar to those of the content analysis of the project proposals. However, the theoretical views expressed in the questionnaires seemed to be more eclectic, i.e. not based on a single but on several theoretical views. Moreover, transmissive views seemed to be more influential here than in the project proposals. We performed a Wilcoxon's repeated measurements non-parametric test to see whether innovative perspectives (mean of constructivist and socio-constructivist views) were more highly adhered to than transmissive perspectives (mean of behaviourist and cognitivist views). This analysis showed that project leaders indeed consider their projects to be more innovative than transmissive ($p=.001$). These results supported those found in the content analysis.

Discussion

The aim of this study was to understand how lecturers interpret pedagogical innovations. First, we studied whether project leaders supported their proposed projects with theoretical work in educational science. At the beginning of our analysis, we noticed that only 15% of the projects presented at least one theoretical reference related to work in educational science. This percentage is very low and consistent with a close reading of these paragraphs, it suggests that the common concern of project leaders is pragmatic rather than theoretical. Similarly, our results also showed large variability in the length of the paragraph and in the percentage of relevant sentences, i.e. referring to approaches to teaching and learning. Our results suggest, in line with Lemaître (2018), that theoretical views on pedagogical innovations and educational principles are generally masked in these projects by the need for operational effectiveness and by student satisfaction. This might be explained by the fact that people who decide which projects to fund are not specialists in educational science. Project leaders therefore choose to defend their project regarding practical needs of the field rather than regarding theoretical foundations.

Subsequently, we studied which theoretical viewpoints were emphasized by teachers and project leaders in the design of pedagogical innovations, using both content analysis and auto-reported methods. The results of the content analysis show that the most represented theoretical views were less transmissive (constructivist and socio-constructivist); however, more transmissive theoretical views (cognitivist and behaviourist) were also present. The results on the questionnaires basically replicate the same pattern of results. Thus, although the focus of the call for projects was clearly constructivist, i.e. learning by doing, other transmissive views were also present. These results are not surprising, since the call for projects

aimed to finance pedagogical innovations that would promote "learning by doing". Project leaders are therefore likely to emphasize arguments supporting active pedagogy corresponding to a constructivist or socio-constructivist view. What is surprising is to find such a high rate of projects that refer to transmissive teaching in terms of lectures and exercises. Indeed, it seems that teachers tend to adapt new pedagogical initiatives to familiar practices, so that transmissive teaching practices are not completely erased, but only partially adapted to a new context (Cuban, 2013). These results are in line with previous research. For instance, Henderson and Dancy (2007) show that physics teachers still use transmissive and direct instruction methods, despite knowing that less transmissive methods exist. Similarly, Norton and colleagues (2005) show that teachers' intentions were more oriented towards knowledge transmission, than toward interaction between the teacher and the student. While these two latter studies are more dated, our results seem to show that, in 15 years, there have been few substantial changes in teachers' pedagogical conceptions, despite the amount of work on pedagogical innovation.

Our results precede the Covid era, and it would be interesting to see whether their experience during the pandemic allowed lecturers to question their pedagogical conceptions of pedagogical innovation (i.e. distance learning), or whether, because of the urgency, new technologies were adapted to transmissive ways of teaching instead of challenging them.

These findings suggest that future encouragement for pedagogical innovation should emphasize structural and technological changes to support teaching, but also a reflection on pedagogical practices. For example, call for projects could be accompanied by seminars to familiarize lecturers with the empirical results of educational research. Individual training sessions could also be provided by researchers in the educational sciences. This could help future project leaders to combine educational needs and instructional methods. It would also be relevant to include more specialists in educational science among the policymakers. Thus, higher education policies to encourage and fund pedagogical innovations is an essential first step in developing and improving pedagogical innovations but should be accompanied by deeper and more permanent changes. For instance, as already suggested by Lami et al. in 2021, France could develop an educational policy that supports instructional training courses not only for newly hired lecturers (as it is currently the case since 2017) but also for experienced lecturers, since instructional strategies constantly evolve.

Limits

Two approaches were used to identify the theoretical views of pedagogical innovations: a content analysis of a paragraph of the project proposals and a questionnaire amongst project managers. In taking this multi-method approach, we aimed to avoid some limits associated with each method. However, a first limitation is that, for the content analysis, since an entire project proposal was sometimes more than 20 pages, we decided to focus on only one paragraph of the funded projects only. Although we selected

the most appropriate paragraph, it is possible that relevant information about theoretical views was present in other paragraphs. A second limitation is the low number of responses to the questionnaire. The questionnaire was distributed to project leaders during a two-day meeting organized by the funding university. In the future, it would be useful to distribute and fill out the questionnaire during a dedicated session. Moreover, due to the health context, we could not conduct planned interviews for obtaining more information on the project leaders' motivations for using pedagogical innovations. Finally, our study was limited to four theoretical views (constructivism, socio-constructivism, cognitivism, and behaviourism). Although these are indeed the most prominent in both the research literature and amongst practitioners, alternative approaches, such as humanistic or connectivist ones, may also emerge in the design of pedagogical innovations in higher education.

Conclusion

We studied the conceptions of pedagogical innovations conveyed by lecturers and project leaders. First, we found that a minority of projects refer to theoretical references related to work in educational science. Thus, we do not find evidence-based pedagogical reasoning, but rather a pragmatic and technical conception of teaching. In other words, it seems that practical objectives are put forward more than theoretical ones. Concerning theoretical views, the most represented one was constructivist, whereas projects can be underpinned by one or more theoretical views. Thus, although the focus of the call for projects was clearly constructivist, i.e. promoting learning by doing, other transmissive views (cognitivist and behaviourist) were also present. In conclusion, our result suggests that even though lecturers are continually encouraged to implement pedagogical innovations (which promote student autonomy, cooperation and/ or the use of innovative material), their attachment to transmissive teaching methods is still present and difficult to overcome. These changes are even more relevant today, because the Covid experience highlighted the urgent need for higher education to promote pedagogical innovation and online learning.

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