

The Preliminary and Subsequent Stages to Integrating Pedagogical Innovation: The Crux of the Matter for the Innovator

Anne Mai Walder

Université de Montréal, Québec, Canada

Within the extremely competitive environment of higher education, professors make a conscious decision to engage in pedagogical innovation projects. Through this qualitative research, I revisit the experience of thirty-two innovators who gravitate between risks and uncertainty, particularly as they teach at a university where research prevails over teaching. The results provide us with in-depth insight into the specific conditions and processes of pedagogical innovation, shedding light on the optional stages and delineating those that appear to be fundamental to the innovation process.

Dans le contexte extrêmement compétitif de l'enseignement supérieur, les professeurs choisissent consciemment d'entreprendre des projets d'innovation pédagogique. Cette recherche qualitative porte sur les expériences de 32 innovateurs qui gravitent entre risques et incertitudes, notamment lorsqu'ils enseignent dans une université où la recherche prévaut sur l'enseignement. Les résultats permettent d'appréhender en profondeur les conditions et démarches spécifiques de l'innovation pédagogique en distinguant les étapes optionnelles de celles qui semblent fondamentales dans le processus l'innovation.

When making the decision to embark on a pedagogical innovation project, the professor is faced with major and complex cognitive processes that recur at various stages. Decision making, a process of choosing between a number of alternatives is generally considered from two different angles and hinges on a results-orientated approach and a process-orientated approach (Zeleny, 1982). The former is supported by the hypothesis that if a person anticipates the results of a decision, it naturally follows that they understand the decision making process. For the latter, it ensues that the opposite occurs.

Undeniably, university professors expect to make rational decisions based on a rational decision making model (Langley, 1989; Simon, 1986), as advocated by the *Rational-Economic Model of Decision Making*. This model begins with the recognition and definition of a specific problem that leads, in principle, to seeking out an alternative action. The alternatives are analysed in order to assess them so as to finally select the best option. The aim of this prescriptive model is to demonstrate how the individual should behave in order to attain the anticipated result. The *Descriptive Models of Decision Making* consider the way in which people make decisions in relation to certain factors such as individual personality, group dynamics, pressure from the outside environment, and lack of available information. Behavioural theory of

decision making (Cyert & March, 1992; March, 1988; Simon, 1960) holds that decision making highlights a specific aspect of human behaviour and emphasises that decisions are made within the confines of *bounded rationalities*.

Simon (1957) recalls that most individuals are only able to make decisions in a rational manner. Consequently, let us assume that the decision making mechanism is affected by cognition, ignorance and emotion: complexity that serves to slow down decision making, which can prove to be a true hindrance. To respond to these negative aspects pertaining to models of rationality and *bounded rationality*, *heuristic-based decision making* becomes essential to speed up the process using heuristic techniques, such as simple, rough guidelines governing the procedure or strategy aimed at solving a particular problem (Kahneman & Tversky, 1972; 1979; 1984; Tversky & Kahneman, 1971; 1973; 1974; 1981; 1983; 1992). The *Judgement Heuristics and Biases Model* does, however, lead to substantive bias towards human intuition, which includes representativeness, anchor-and-adjustment, and availability. Thus, it is certainty, a balanced and comfortable stability, that the professor innovator must leave behind in order to navigate through risky circumstances that plunge them into limited instability, or even, in some cases, absolute uncertainty arising from unbounded instability. The chronological and systemic model of chain decisions (Bru, 1991) places the emphasis on the choice of learning objectives, which favours certainty. However, what about professors who risk innovating?

By means of the specific nature of pedagogical innovation projects and in support of the development of pedagogical innovation projects, the *Inter-Faculty Teaching and Technologies Support Network* (RISET) of the Université de Lausanne offers the opportunity to take an interest in pedagogical, technological, disciplinary, media-centred, organisational, administrative, financial, and political aspects, not only from a course and curriculum perspective, but also that of the institution (Spang Bovey, Kramar, Fernandes, & Restrepo Zea, 2010).

Professors impose on themselves a type of liberation from the conformism linked to the university and disciplinary culture that they have been immersed in since their student days. Daring to do something in another way or choosing to do something differently for the purpose of improvement comes with the risk of losing the support of their peers. I aim to explore the pedagogical innovation process of professors who make the decision to embark on an innovation project, place themselves in a position of uncertainty throughout the process. Only a tiny percentage of professors describe themselves as being innovators within so-called research-intensive universities where teaching is clearly not a priority, therefore, the intent is to discover what kinds of conditions and processes underpin these professors' pedagogical innovation.

In Search of the Pedagogical Innovation Process

Pedagogical innovation is also called scholastic innovation in education or in training and calls for one-off, measured, and sustainable positive change. Pedagogical innovation corresponds to a change that Béchar (2000) defines as, "an intentional action that aims to introduce something original into a given context, and it is pedagogical as it seeks to substantially improve student learning in a situation of interaction and interactivity." (p. 3), which he later expands upon, noting "In a university context, pedagogical innovations are often described as everything which is not lecturing, the method still used by the overwhelming majority of professors." (Béchar & Pelletier, 2001, p. 133).

My research regards pedagogical innovation as any teaching, any new action that aims to

improve student learning that is delivered in ways other than the traditional practice of the lecture. However, the analysis and interpretation of the interviewed professors' discourses has allowed me to propose an updated definition of pedagogical innovation:

It is a new way of teaching, unlike those commonly used; it is bespoke and surprises students. Consequently, it heralds a change driven by a transitory adaption to pedagogical objectives and the new student profile. It stems from a reflection that is pedagogical, intellectual, creative, psychological and sustained, and that shapes itself progressively through a multi-level and multi-impact process linked both to the audience and the discipline or the technology and that aims to improve quality, like a desire to make the subject understood and foster success. Unlike technological innovation, the innovation is only pedagogical if it is constructed by pedagogical thinking, in particular in human relations at the will of the personality of the devoted professor. (Walder, 2014, p. 200)

Research literature on the process of pedagogical innovation is limited mainly to innovation in the more general sense of the word, technological innovation, and management of innovative projects. Hannan and Silver (2000) identify three pedagogical innovation development phases within higher education institutions: personal innovation inspired by individuals; guided innovation established through institutional financing; and directed innovation to institute the requirements of the university institution whose aim it is to maximise return on investment in new technologies or the promotion of student-focused learning due to efficiency.

Consequently, three main pillars constitute the process of creating innovation, namely invention, appropriation, and institutionalisation (Alter, 2000). Invention is the pivotal moment when the innovation will be accepted or rejected. Then comes appropriation, the key moment when consumers, who have until this point been subjected to the introduction of novelty, become partners. Finally, comes the moment when the innovation becomes the rule and is formally institutionalised, thus inexorably reducing uncertainty.

From an entirely different angle, that of insertion, Depover and Strebelle (1997) advocate the systemic model of innovation in three stages. These are *adoption*, which entails exploration and discovery, *implementation*, which involves the incorporation of new uses and practices, and *routinisation*, which consists of optimisation. This three-stage model is complimented by *infusion*, or the anchoring of new uses and practices, or an even spread which falls between the latter two (UNESCO, 2004).

From a practical perspective, the RISET of the Université de Lausanne has put forward project management phases (Spang Bovey, Kramar, Fernandes, & Restrepo Zea, 2010). Located midway between objectives and general questions, the first phase is entitled *needs analysis* and includes context analysis, project staffing constraints and resource assessment, as well as preparation for rolling out and integrating online courses into the curriculum dependent on the specific characteristics of the institutional setting. The second phase, *drafting of the plan*, allows the learning objectives, pedagogical approach, content modularisation, and tools to be determined. The third phase, *production and testing of elements of the plan*, concerns the development of learning media, constructing content and resources, making the prototype, trialling, and user acceptance testing. The fourth phase, *piloting and evaluation*, refers to usage in a real-world context, the methodology, and the procedure to be defined. Finally, the fifth and last phase, large-scale *implementation and roll-out*, are both concerned with technical maintenance, updating, and guidance during normal operation.

This theoretical framework offers specific technical and didactic insight into the stages involved in pedagogical innovation, which confirms the relevance of this research in exploring

the experiences of university professors in order to gather their perspectives relating to the process of pedagogical innovation. My theoretical lens provides insight into the different stages involved in pedagogical innovation process from the perspectives of university professors.

Methodology

This qualitative study was made possible through the participation of assistant, associate, and full professors, each recognised by their peers for their commitment to and excellence in teaching at the Université de Montréal. Forty nine (49) professors matching the criteria were solicited and 37 agreed to participate in this research. The first two interviews were considered test-interviews and were excluded from the findings. I reached empirical saturation (Glaser & Strauss, 1967, p. 67) or called of knowledge (Bertaux, 1981, p. 37) on the 32nd interview (excluding the test-interviews). The sample consisted of 32 assistant (16%), associate (44%), and full (41%) professors. Forty-four percent (44 %) were men and 56 % were women. Only 44% were committed to a management responsibility. Fourteen (14) professors were from faculties of veterinary medicine, medicine, nursing, pharmacy, or architecture, six (6) were from education or law, six (6) from sciences, and six (6) were from social and psychology sciences. According to Becher's (1989) classification, 14 professors were from hard-applied sciences, six (6) from soft-applied sciences, six (6) from hard-pure sciences, and six (6) from soft-pure sciences.

I conducted individual semi-structured interviews at the professor's office and one group interview in a room rented outside the university with five participating professors. Individual interviews were scheduled with participants' authorisation and adapted from Hannan and Silver's (2000) ten points:

1. The clarification of the interview (who I am, going through the ethics protocol and their innovations, what and when);
2. The previous history relevant to innovation (when he/she became innovator, how did it happen, in what context, alone or in collaboration);
3. Why innovate? (intention, purposes, pressures, inducements or opportunities, theory);
4. The innovation proceed (its extend, support, departmental, institutional or external, the implementation process, the responses of colleagues, students and the institution, its evaluation);
5. The life history of the innovation (Continuation, adaptation, extension / adoption);
6. The interest in the innovation (Publications, other outcomes);
7. The reflection on the process (adequacy of the support, opposition and obstacles, roles of committees and colleagues, did it survive, died, become embedded, change);
8. The personal outcomes as innovator (Is there any? Positive and negative outcomes);
9. Lessons (implications for innovation / innovators, implication for institutional organization / policy, implication for funding bodies, quality assurance); and
10. Thanks.

In order to gain insight into the way in which professors innovate at a university strongly committed to research, I sought to identify the conditions and processes underlying pedagogical innovation. Interviewed participants took part in this process with enthusiasm and precision

and explained how they implement pedagogical innovation. This provided extremely rich data. Four hundred and fifty pages of verbatim feedback were transcribed from the recordings made of thirty-two semi-structured individual interviews and one group interview.

I used grounded theory, a data analysis method and analytical process introduced by Paillé (1994, p. 149), with the aim of advancing this research topic beyond simple descriptive analysis. This analytical process of extracting the data gathered during the individual interviews allowed me to structure 128 sub-themes related to the conditions and processes underpinning pedagogical innovation. These were the substantive categories (Glaser & Strauss, 1967) provided by the unmodified participants' discourses.

I drew up relationships between the categories by using "the paradigmatic model indicating the main dimensions of an action category: its causes, its context, its structural conditions, the actions and interactions that it encompasses and their consequences" (Laperrière, 1997, pp. 319-320). I studied internal and horizontal recurrence and their degree of congruence with the *draft theory* (Fourez, 1988) of this research, which offers a unique perspective on the process of pedagogical innovation. Using my analysis, the formal categories were constructed through the links revealed between the substantive categories and their hierarchical organisation. All this occurred within a process of constant-comparative data analysis, a kind of continuous shuttling back and forth between the substantive categories taken directly from the professors' discourses and those elaborated by the researcher.

Participating professors were asked the question: What is the pedagogical innovation process? Four participants said that implementing an innovative project consisted of many different stages.

The analysis of the data collected relating to the conditions and processes underpinning the integration of a pedagogical innovation project enabled me to identify eight successive stages in the pedagogical innovation process arising from the participating professors' discourses (Appendix A). These are: the source of the pedagogical innovation choice, the intervention type, support, integration, pedagogical innovation evaluation, pedagogical innovation, continuity and improvement, propagation, and consequences.

The construction of these formal categories, called *Optional Stages*, represents a distinct, different stage. However, without being altogether compulsory, the construction took place through the links found to exist between the substantive categories and their hierarchical structure within the framework of my research project. All this occurs within a process of constant comparative data analysis, a kind of continuous shuttling back and forth between the substantive categories taken directly from the lecturers' discourses and those devised by the researcher. This is based on the notion that I am studying internal and horizontal recurrence and their degree of congruence with the 'draft theory' (Fourez, 1988) of my research, which aims to shed light on the conditions and processes involved in implementing a pedagogical innovation project, by professors at a university strongly committed to research.

The Eight Stages of the Pedagogical Innovation Process

The first stage concerns the source of the pedagogical innovation choice, whereas, according to the participants, the second assists in defining the intervention type. The third stage is linked to support, whereas the fourth introduces the integration stage. The fifth relates to evaluating a pedagogical innovation while the sixth notion briefly explores continuity and improving pedagogical innovation, the seventh concerns its propagation, and the eighth phase deals with

consequences. In order to guide the reader, I illustrate the eight (8) stages with their respective sub-themes by frequency and instance (Appendix B).

Stage 1: The Source of the Pedagogical Innovation Choice

The first stage concerns the source of the pedagogical innovation choice. This hinges on initial reflexive practice, which in general seems to occur from the very outset of a professorial career, means of inspiration, and factors that define the way in which the professor constructs pedagogical innovation.

Fourteen professors confirmed that they had been innovating since the start of their career, noting that “Right from the time I started working, I kept to myself, away from the other people with whom I was working, as my way of doing things, my way of being, was different” (case 17). One of the professors indicated that he incorporated pedagogical innovation at a later stage, once he was fully immersed in his environment.

According to eleven professors, pedagogical innovation arises from an idea that springs to mind as they are reflecting on their teaching. In other words, “By asking myself questions, by being reflective. So, by constantly going back over what I say, going back to the point when I actually say it, in the seminar or lecture theatre!” (case 23). Innovation also came to the fore “before doing something new, one has to think about it, one has to entertain a pedagogical idea that is based on theories, models, concepts” (case 32).

Data analysis revealed that inspiration could be drawn from literature. Just as important, experience as a student leaves its mark and seems to be a driving force in inspiring innovation, according to eight professors. In addition, one professor explained, “Most of my pedagogical ideas occur to me as a reaction to what I don't like in teaching” (case 22). Specifically, the professors' notion of the act of teaching played a significant role, according to six participants, in terms of the source of pedagogical innovation. For five others, the professors' personality also has an impact on the way in which pedagogical innovation will be chosen and implemented. One professor attributes his dissatisfaction with the traditional-style teaching they give as a source for their decision to innovate, claiming, “I didn't like the way in which it was being done in a traditional theoretical course” (case 3). To a lesser extent, I can nonetheless discern the impact of discussion amongst professors, which, according to one of them, helps to commit oneself to pedagogical innovation. He unpacks this notion by saying, “The idea was already floating around, but after a meeting between professors, it really took flight” (case 32). The conception of learning is, for one of the professors, the source of his pedagogical innovation, while another believes that his innovation stems from pedagogical training.

The factors that define the way in which the innovator constructs pedagogical innovation are rooted in their conception of the act of teaching, the professors' personality, dissatisfaction with the course that is given in a traditional way, discussion with peers, literature, the participants' conception of learning and, finally, pedagogical training.

Stage 2: A Preference for Group Intervention

This section focuses on the different types of pedagogical innovation intervention. Undoubtedly, intervention takes place in relation to two axes. The first entails group versus individual intervention, while the second concerns institution-initiated versus professor-initiated intervention. Pedagogical innovation is either initiated by the institution from the top down, or

from the bottom up through spontaneous actions—often conducted in isolation—on the part of the teachers. Hannan and Silver (2000) identified three stages of pedagogical innovation development within higher education institutions: personal innovation inspired by individuals, guided innovation established through institutional financing, and directed innovation to institute the requirements of the university institution, whose objective it is to maximise return on investment in new technologies or the promotion of student-focused learning as a means of efficiency.

The most frequently mentioned intervention, with 21 professors out of 32 citing it, is group intervention. Two professors believed that pedagogical innovation is constructed cooperatively, with one participant pointing out that group intervention allows for faster progress, stating, “Always as part of a team, as I find you go a lot quicker, a lot further as part of a team” (case 13). Here I detected a performative connotation with, sometimes, the idea of satisfaction which elicits “competition between a group of professors” (case 27) or the notion of improvement that this collaboration offers “The more of us there are, the bigger and more enticing the challenge, and also the more useful it is for students when we want to completely change the programme” (case 2). However, a shared vision of the adopted pedagogical innovation proves to be an important criterion when the innovation is implemented within a team and sustained monitoring of the project can call for regular pedagogical meetings.

The typology shows the substantial (15 professors) use of student actors, sometimes including former students, “For the internship course that I give, I have built it up over time together with teaching assistants, who were students who graduated from my laboratory” (case 22), as well as professionals with the clear aim of exchanging experiences that go beyond the subject itself, to provide a different perspective, “Sometimes for example with people from other disciplines, IT specialists or artists, even musicians” (case 20). To conclude the group versus individual intervention dimension, I note that few professors displayed equal interest in group and individual intervention. It is important to note that innovation frequently occurs only at an individual level.

Regarding the second axis covering institution-initiated versus professor-initiated intervention, it seems clear that pedagogical innovation is, for the most part, implemented individually by the professor. Nonetheless, less frequently, the results suggest that some intervention types are instituted by the faculty. One professor noted, “You can't innovate in a group with everybody; some people are more open to this, others not, especially in the university environment” (case 12). Intervention at the programme-level appears to be somewhat effective when the ultimate goal is based on a very open, global projection,

In my experience, it's a lot more effective when a faculty, a department, a programme, a group of professors all get together and say ‘okay, we're not just going to change a course, we're going to change something more than that . . . the whole programme and course sequence’ . . . it's more effective that way. (case 32)

To conclude, it is relevant at this junction to emphasise an atypical type of programme intervention, namely a real patient trained to be a teaching partner. This person is not a role-playing actor but someone who is genuinely ill with a history of suffering and the experience of being a patient who is going to learn how to treat themselves as well as become a trainer for the care team.

Stage 3: Support for Pedagogical Innovation

The data extracted from the professors' discourses regarding the support they have when they want to make use of pedagogical innovation in their teaching at the Université de Montréal allowed me to group the sub-themes into five categories:

1. financial support;
2. specialised support;
3. institutional support;
4. support inherent to human resources; and
5. technical support.

The first category, financial support, indicates that the financial aspect was most often cited by the professors who confirmed that they received funding where this type of support was available. However, the professors highlighted that it was either lacking or limited to technological needs, which they emphasised were very costly. Professors tended to put forward grant applications, as one of the professors explained, "If we hear about a competition which has some budget left to work on it, we're going to go out and find that competition! (case 17). Some participants gave up on these tedious and cumbersome procedures for innovation, admitting that they had to make do with the research funds available to them. To conclude this category, it was evident that financial support was not absolutely necessary for innovation, as many types of pedagogical innovation were not dependant on financial resources, as one professor noted,

And then I don't need money to do what I'm doing. I can understand that in some cases financing is needed to create a new manual, etc., but I don't have a manual, I don't have course notes, I don't have a website. . . . So of course I'd like to get some funding, but what would I do with it? (case 22)

The second category deals with the specialised support provided by various pedagogical and technical centres. Sometimes simultaneously pedagogical or technical financial support, specialised support appears to be provided mainly by pedagogical and technical support organisations whether they are available to the university in general from organisations such as the Higher Education Study and Training Centre (CEFES) and the Directorate General for Information and Communication Technologies (DGTIC) or more specifically at a disciplinary level when they come into play for departmental groupings of one or several faculties for the Centre for Applied Pedagogy in Health Sciences (CPASS) or the Centre for Innovation in Nursing Training (CIFI). Although most of the professors are well aware of their existence and function, some professors approach them for technical reasons and others state that they make little use of them while others still lament insufficient support from the CEFES.

Direct institutional support seems to be, according to participants, the third pillar of innovation in terms of support. In fact, most of the professors cited the university as the main source of support, noting "To me it makes a difference when a Dean is able to look at each teacher in their faculty and say 'I will provide you with a context that allows you to be creative and innovative'" (case 25). However, the absence of any form of support was also mentioned by some of the professors.

Indirectly related to the institution, the fourth category, support in terms of human resources, was a relatively common theme. It was also highly appreciated in the event of a

colleague who possesses the knowledge required, as this was the highest scoring code in this category. Besides the unavoidable administrative complexity that integrating a pedagogical innovation entails, it appeared to sometimes be necessary to convince other professors to participate, which posed an additional challenge, such as “convincing people to take part, that's what I find the difficult part is!” (case 2). That said, support in terms of human resources, evoked in a favourable light, centres around teaching assistants, research assistants, and volunteers as well as those represented to a lesser extent, such as one participant who regretted the lack of availability of a human resource in their faculty.

The fifth and final category, technical support, was only sporadically available in cases where it was not related to equipment or availability for large groups. Regarding support for pedagogical innovation, participating professors tended to rely on and seek all of the types of support cited above (financial, specialised, institutional, human and technical resources). This naturally lead me to explore the process further through their integration, which I will cover in the following section.

Stage 4: Integrating Pedagogical Innovation

The fourth progressive stage of pedagogical innovation development involves integrating it into a course, a workshop or a programme, which entails factual planning followed by an integration stage. For the most part, the participants cited a rather short preparation period, which lasted from as little as a few hours to as much as two years, depending on the complexity of the pedagogical innovation selected:

There is a quick reaction: if I have an idea, I integrate it the next morning. It does sometimes happen to me-I wouldn't exactly say that I improvise, because I'm always prepared for a lecture, but a thought could occur to me during the week causing me to change something, as long as it fits in with the particular programme and timetable, I can sometimes incorporate something new. (case 19)

Some professors estimated that it takes two years or more to integrate pedagogical innovation. To be very specific, in a few cases, the delay could extend beyond two years, particularly if the pedagogical innovation required a grant application to be drafted. One participant explained that implementing a pedagogical innovation was a progressive process, “I would say from experience, five or six years easily, to be able to put it together properly and integrate it into the context” (case 30).

Eleven participants explained that after having considered an innovation, they tried to put it into practice. This is the *integration* phase where the idea becomes more concrete, “First you had to create the programme, and then implement it” (case 16). Particular attention must be paid to coordinating quality when incorporating pedagogical innovation into the classroom. One professor explained that he adapts his pedagogical innovation on the spot, depending on his audience. The professor can also call on the student to co-construct pedagogical innovation,

It changes constantly because they are the ones who decide. Not only what their research project is, but also what the group project will be at the end. So they are the ones who decide. As for me, I don't decide anything. At the beginning of the session, I don't yet know what we're going to be doing. (case 5)

Finally, pedagogical innovation becomes integrated progressively and makes use of trial runs.

Stage 5: Evaluating Pedagogical Innovation

The logical progression of the integration of innovation within a pedagogical process inevitably leads to assessment thereof. There are many different reasons for this evaluation which, in particular, allows for relevant feedback to be provided on the impact, efficiency, and the way in which the course change was received.

The professors touched on three main themes, bringing to the fore a certain degree of malfunction, which can be inevitable in a process of change: two concern evaluating pedagogical innovation while one is an alternative solution. These are respectively a case of the absence of formal evaluation specific to the introduction of pedagogical innovation and, more generally, the student questionnaire for evaluating teaching provision being unsuitable, with, alternatively, the self-evaluation that the professor imposes on themselves.

The professors indicated firstly that there is no formal evaluation of pedagogical innovation at the Université de Montréal nor is there any quality assurance. Secondly, I learnt through the participants' discourses that the student questionnaire for evaluating teaching provision appears to be inadequately drafted, with no mention made of the possibility of pedagogical innovation.

When participating professors conducted a self-evaluation of their pedagogical innovation then it was usually a type of report, which five of the participants deemed to be necessary in order to conduct an evaluation. The discourse extracted from nine individual interviews suggested the importance of improving pedagogical innovation, as one participant expressed,

It works relatively well in the first year; in the second, we correct its errors. And where significant experience is gained, as was the case over the course of ten weeks, before we're able to make it work in a more or less correct manner, there is a fair amount of trial and error, more than just one class. For a course, after three or four years, if we have made changes, we correct a lot in the first year, but after three years, it should be more or less right. (case 24)

Finally, 10 professors revealed that *self-evaluation* guided their own actions and their desire to correct themselves, to improve or reject their own innovation, in accordance with the normal, self-critical, and responsible behaviour a professor has the duty of imposing on themselves,

The evaluations have led us to modify, and improve, among other things, the modules that were initially too long. For the web-based modules, we summarised them, we divided them up, we added videos to them, we added all sorts of activities such as questionnaires, sorts of reflection modules, reflection capsules... this also helps us to adapt ourselves-even us, as professors; I think that we should evaluate our teaching activities after we've given a class. What about it worked? What worked less effectively? And then make adjustments to it. (case 4).

To conclude, the participants more or less expressed marked interest in the need to obtain a constructive evaluation of their teaching. Several professors developed their own means of evaluation to enable them to get feedback from their students or peers and to refine, add value to, adjust, change, or transform their pedagogical innovation with the aim of improving their teaching.

Stage 6: Continuity and Improvement

For the most part, professors seem to pursue their innovation, with many of them initiating the design of new innovations. This stability seems to result from the on-going improvement, adaptation, and gradual adjustment that they apply when necessary. A very pronounced notion of continuity clearly emerged from the professors' discourses, to the point, for some, of talking about their successor as they were no longer lecturing the course in question, "I am no longer the one giving this course. The professor who took it over maintained some of this philosophy, so at least that has been retained" (case 9). The notion of striving to improve within the pedagogical innovation process is linked directly to its continuity. In effect, what appears to perpetuate pedagogical innovation in itself is its own improvement, similar to fighting the ageing process.

Stage 7: The Propagation of Pedagogical Innovation

It is not easy to assess the propagation of pedagogical innovation. In effect, from the simple revisiting of an idea to teacher cooperation with the aim of sharing some form of tried and tested pedagogical innovation with a colleague there is great scope for disparities as regards possibilities. According to the interviewed professors, the propagation of their pedagogical innovation either remains unknown or is not considered important.

Other respondents indicated that their pedagogical innovation was used by one or more other professors as well as by other departments or faculties at the Université de Montréal. It was surprising to note that students also made use of pedagogical innovation. In some cases, the propagation of professors' pedagogical innovation broke through institutional barriers. There was clear evidence that pedagogical innovation used at the Université de Montréal was adopted by other universities and at a regional level throughout Quebec.

Stage 8: Consequences

Analysis of this theme led me to uncover two dichotomous schools of thought. On the one hand there are professors who consider it their duty to inform others about their pedagogical innovation and, on the other, there are those who believe this does not fall within their role and responsibilities. In the latter case, the instinctive aspect of improving their teaching does not appear to cause them to set their sights on publishing on topics other than those contained within the ambit of their disciplinary research. Moreover, they do not consider this a goal. Whether they like it or not, although publishing about one's teaching practice and one's discipline's pedagogy does not fall within their primary role and responsibilities (except for professors in the Education Sciences), findings suggest that the majority of professors publish and orally share the pedagogical innovation at academic conferences or subject-related meetings. In the light of this, the main consequences are the publication of articles, oral communication, and authored books that can take precedence over personal productions, thus suggesting that pedagogical innovation promotes team spirit more than it does individualism. I consider it important that some of the respondents aim to publish their work and during the individual interviews, they became aware of this possibility. Lack of time and resources, however, poses a challenge to the professors who despite everything, wish to share their practices and want to allocate themselves the time to do this. In addition, I note that the most

dedicated professors take it upon themselves to conduct studies or sometimes even research on their pedagogical innovation,

In fact, I'm in the process of completing a study not to assess our students' appreciation, but rather their perception of the usefulness of all of our learning resources. To this end, I compiled a whole series of surveys for our students. And in fact all the types of innovation we use can be found in it. (case 11)

Discussion

This section compares the eight optional stages of my pedagogical innovation process with those that I elicited in the conceptual framework. The *needs analysis* phase of Spang Bovey et al.'s (2010) project management could be equated to the *source* phase except for the addition of a notion of reflection and decision appropriation or the professor's own desire, which clearly comes to the fore. Hannan and Silver's (2000) three phases of innovation development are not surprisingly grouped together within the *Intervention Type* category. The *conception of the process* phase of Spang Bovey et al.'s (2010) project management can be found midway between the *support* and *intervention type* categories. *Adoption*, arising through Depover and Strabelle's (1997) exploration and discovery, could possibly be shared between *support* and *intervention type*, and then lead towards *integration*. *Implementation* (Depover & Strebelle, 1997) corresponds to the *integration* phase. The *production and testing of elements of the process, pilot and evaluation*, and *implementation and roll-out* phases of Spang Bovey et al.'s (2010) project management are incorporated in my results' *integration* and *assessment*. I note that personal innovation and institutional innovation are initially implemented in a definitive way as opposed to the numerous stages described by Spang Bovey et al. (2010). Alter's (2000) *invention* phase, the point at which the innovation is accepted or rejected, could correspond to the *continuity and improvement* phase. *Routinisation*, which is, according to Depover and Strebelle (1997) in fact optimisation, becomes merged with the *improvement* stage. Alter's (2000) second *appropriation* phase, which occurs when consumers of the innovation become partners to it, is similar to the *propagation* where other professors, or even students, can, in turn, make use of the innovation. I emphasise that the *institutionalisation* phase (Alter, 2000) and that of the *infusion* phase (UNESCO, 2004), when the novel practice becomes the rule and is formalised, were not cited by the professors; once the innovation had reached this status, the professors no longer considered it as such.

Thus, analysis of my research results has allowed me to highlight the fact that, according to the participants, the pedagogical innovation process hinges on eight optional stages. Nevertheless, these stages are not cited by the participants with the same frequency. That is, certain optional stages have more segments coded to them than others. In other words, professors do not pass through all the stages when implementing pedagogical innovation. Some of the optional phases in particular appear to be more important to them than others. In more detail, evaluation represents 22%, support equates to 20%, continuity and improvement 18%, integration type 16%, consequences and source both total 7%, with integration 6% and propagation 4%. Appendix C shows the representation of these optional stages in terms of their previously alluded to path.

According to the interviewed professors, it becomes evident that, *Evaluation, Intervention Type, Support, and Continuity and Improvement* could be the fundamental stages

underpinning the progression of the implementation of a pedagogical innovation project.

Exploring this notion further, the source of innovation, which is the reason why the professor innovates, does not seem to be of much interest to the professors. On the other hand, the intervention type, which is whether the innovation should be carried out individually or as a team, and support, whether it be financial, specialised, institutional, or inherent to human or technical resources, is what professors are more concerned with. Surprisingly, *integration* was not a topic to which much attention was paid. On the other hand, the *evaluation* of their pedagogical innovation appears to be crucial to all professors, as is *continuity* and *improvement*. The two last phases are directly linked to the results of their pedagogical innovation. I note that from the preliminary stages, *intervention type* and *support*, as well as the subsequent *evaluation* and *continuity and improvement*, appears to be cited most frequently by the participating professors. Logically, it would be tempting to hypothesise that the process of pedagogical innovation is structured somewhere between knowing how to innovate (i.e., *intervention type* and *support*) and the ensuing results of the pedagogical innovation (i.e., *evaluation* and *continuity and improvement*).

Conclusion

This research facilitated an in-depth exploration of conditions and processes underpinning pedagogical innovation in order to complement existing knowledge on this complex topic. The richness of the data collected allowed comparison, integration, modelling, and theorising leading to the eight optional stages of pedagogical innovation. The results shed insight into the preliminary and subsequent stages of integrating pedagogical innovations most cited by the innovator. The process of pedagogical innovation may revolve around *how to innovate* and the ensuing results.

Consequently, in terms of decision making throughout the pedagogical innovation implementation process, it appears pertinent to put forward the hypothesis, with the aim of identifying new research perspectives, Are the stages of intervention type, support required, evaluation, and continuity and improvement not also those that are the most dependent on decision making in this process?

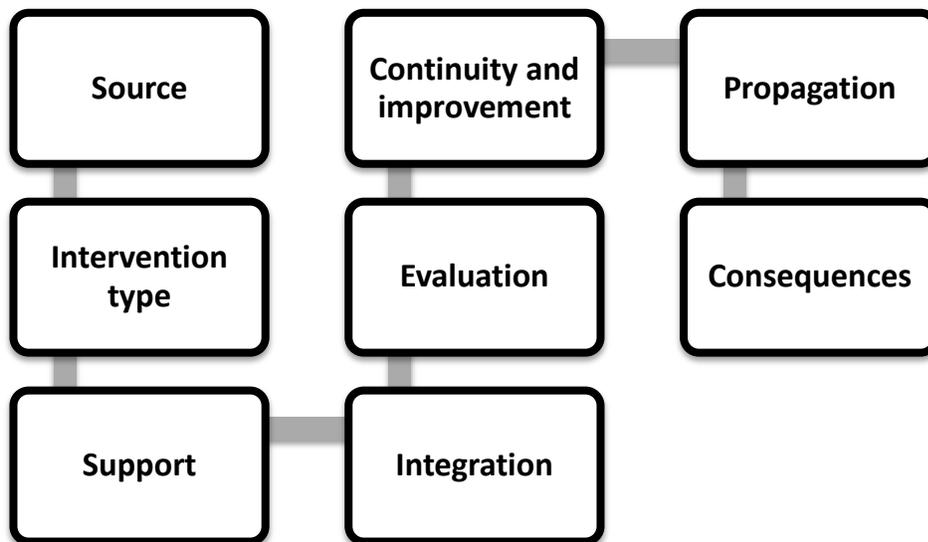
References

- Alter, N. (2000). *L'innovation ordinaire*. Paris: PUF Quadrige.
- Becher, T. (1989). *Academic tribes and territories: Intellectual enquiry and the culture of disciplines*. Buckingham: UK: The Society for Research into Higher Education and Open University Press.
- Béchar, J. -P. (2000, Septembre 6). Apprendre à enseigner au supérieur: L'exemple des innovateurs pédagogiques. *Cahier de recherche OIPG 2000(001)*,, 1-14.
- Béchar, J. -P., & Pelletier, P. (2001). Développement des innovations pédagogiques en milieu universitaire : cas d'apprentissage organisationnel. In D. Raymond (ed.), *Nouveaux espaces de développement professionnel et organisationnel* (pp. 131-149). Sherbrooke: Edition du CRP, University of Sherbrooke.
- Bertaux, D. (1981). *Biography and society, The life history approach in the social sciences*. Thousand Oaks, CA: Sage.
- Bru, M. (1991). *Les Variations didactiques dans l'organisation des conduites d'apprentissage*. Toulouse: EUS.
- Cyert, R., & March, J. G. (1992). *A behavioral theory of the firm* (2nd ed.). Englewood: Prentice Hall.

- Depover, C., & Strebelle, A. (1997). Un modèle et une stratégie d'intervention en matière d'intégration des TIC dans le processus éducatif. In L. O. Pochon, & A. Blanchet (eds.), *L'ordinateur à l'école: De l'introduction à l'intégration* (pp. 73-98). Neuchâtel: Institut de Recherche et de documentation pédagogique.
- Fourez, G. (1988). Formation éthique et enseignement des sciences. *Ethica*, 5(1), 45-66.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory. Strategy for qualitative research*. Chicago: Aldine Pub. Co.
- Hannan, A., & Silver, H. (2000). *Innovating in Higher Education: Teaching, learning, and institutional culture*. Buckingham: Society for Research into Higher Education and the Open University Press.
- Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology*, 3(3), 430-454.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-292.
- Kahneman, D., & Tversky, A. (1984). Choices, values and frames. *American Psychologist*, 39(4), 341-350.
- Langley, A. (1989). In search of rationality: The purposes behind the use of formal analysis in organizations. *Administrative Science Quarterly*, 34, 598-631.
- Laperrière, A. (1997). Convergences et divergences entre la théorisation ancrée et d'autres approches, L'ethnographie. In J. Poupart, J. -P. Deslauriers, L. -H. Groul, A. Laperrière, R. Mayer, & A. P. Pires (eds.), *La recherche qualitative: Enjeux épistémologiques et méthodologiques*. (pp. 309-330). Gaëtan Morin.
- March, J. G. (1988). *Decisions and organizations*. London: Blackwell.
- Paillé, P. (1994). L'analyse par théorisation ancrée. *Cahier de recherche sociologique*, 23, 147-181.
- Simon, H. (1957). *Administrative Behaviour*. New York: Macmillan
- Simon, H. (1960). The new science of management decision. New York: Harper.
- Simon, H. (1986). Rationality in psychology and economics. *Journal of Business*, October, 209-226.
- Spang Bovey, N., Kramar, N., Fernandes, E., & Restrepo Zea, C. (2010). Critiquet. Réseau interfacultaire de soutien enseignement et technologies, Université de Lausanne. Retrieved from <http://www2.unil.ch/critiquet/index.php5>
- Tversky, A., & Kahneman, D. (1971). Belief in the law of numbers. *Psychological Bulletin*, 76(2), 105-110.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), 207-232.
- Tversky, A., & Kahneman, D. (1974). Judgement under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-458.
- Tversky, A., & Kahneman, D. (1983). Extensional versus intuitive reasoning: The conjunction fallacy in probability judgement. *Psychological Review*, 90(4), 293-315.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5(4), 297-323.
- UNESCO (2004). *Technologies de l'Information et de la Communication en Education: Un programme d'enseignement et un cadre pour la formation continue des enseignants*. Retrieved from <http://unesdoc.unesco.org/images/0012/001295/129538f.pdf>
- Walder, A. M. (2014). The concept of pedagogical innovation in higher education. *Education Journal*, 3(3), 195-202.
- Zeleny, M. (1982). Multiple criteria decision making. New York: McGraw-Hill.

Anne M. Walder is an Associate Professor at the Université de Montréal and was previously a UCLA Postdoctoral Scholar at the Graduate School of Education and Information Studies at University of California, Los Angeles. Following a Doctorate of Business Administration, she was awarded a PhD in Education from the Université de Montréal. Specialised in andragogy and teaching and learning in higher education, her research interests focus on pedagogical innovation, and in particular the professor-student pedagogical relationship in this context, disciplinary cultures, supervision of PhD students, research training, cooperative learning, pedagogical communication, and adult education.

Appendix A: The Eight Optional Stages of the Pedagogical Innovation Process



Appendix B: Eight Optional Phases in the Pedagogical Innovation Process, Sub-themes by Frequency and Case

Optional stage	Sub-theme	Frequency ¹	Instance ²
Source of PI	From the outset	16	14
	Start of PI two years after becoming a professor	5	1
	Reflexive practice	19	11
	Conception of learning	1	1
	Conception of the act of teaching	7	6
	Discussion between professors	1	1
	Literature	14	10
	Experience as a student	11	8
	Pedagogical training	1	1
	Dissatisfied with traditional courses	2	1
	Personality	5	5
	Source of PI	82	59
Intervention Type	Likes group and individual	3	2
	Group	79	21
	PI is established in a cooperative manner	3	2
	Professionals	10	6
	Students	33	15
	Personal	25	13
	Instituted by the faculty	9	4
	Not possible to innovate with everyone	9	2
	Patient and their family	3	2
	More efficient by programme	4	1
	Shared vision	2	1
	Pedagogical meeting	4	2
	Intervention type	184	71
Support	At University level	27	10
	Research assistant	3	2
	Teaching assistant	9	6
	Volunteers	3	1
	CEFES/BENA	41	15
	Infrequently used pedagogical centres	5	2
	CIFI	1	1
	CPASS	5	2
	Freeing up of time lacking	3	2
	DGTIC or equivalent	1	1
	Competitions / grants	1	1
	Financing available	15	7
	Financing lacking	26	13
	Financing obtained	36	12
Financing not requested	17	8	
Financing_ Only for technologies	4	3	

Optional stage	Sub-theme	Frequency¹	Instance²
(Support, Continued)	Research funds	3	2
	Equipment	2	1
	No resource person	2	1
	No institutional support	9	5
	Insufficient CEFES support	2	2
	Technology	8	5
	Technology lacking	2	1
	Expensive technology	2	1
	A colleague possessing the required knowledge	12	4
	Convincing other professors to participate	3	2
	Support	242	110
Integration	Integration	19	11
	Preparation-less than 2 years	42	24
	Preparation-2 years and more	6	5
	Progressive	1	1
	Test run	1	1
	Coordination	2	1
	The PI is adapted to the group	2	1
	Students create the PI	2	1
	Integration	75	45
Continuity and improvement	Continuity and improvement	16	9
	Quitting	9	5
	Not innovative for a very long time	3	3
	Continuity	46	17
	Planning	39	15
	Used by other colleagues	9	6
	Use of PI in another one of their courses	5	3
	Has stopped, no longer giving these lectures	5	4
	2 or 3 years (adaptation)	1	1
	4 or 5 years (adaptation)	2	1
	Addition (adaptation)	3	2
	Gradual adjustment (adaptation)	36	15
	Public-related (adaptation)	5	3
	Professor-related (adaptation)	1	1
	Not done, no funding (adaptation)	1	1
	Not necessary (adaptation)	7	5
Ongoing (adaptation)	29	14	
	Continuity and improvement	217	105
Evaluation	PI evaluation	3	2
	Allows for improvement of PI	9	5
	Quality assurance to be improved	3	3
	Quality assurance must depend on the professor	1	1
	Self-evaluation-Professor	26	10
	Self-evaluation used	3	2

Optional stage	Sub-theme	Frequency¹	Instance²
(Evaluation, continued)	PI report	2	1
	Programme committee	15	10
	Feedback-students	29	17
	Feedback-informal external	5	3
	Student guidance	2	2
	Difficulty in attributing success to a particular PI	4	2
	Issues with the usefulness of comments-students	1	1
	External evaluator	3	2
	Formative evaluation	5	4
	Evaluation through verifying skills	3	2
	Ongoing evaluation	2	2
	Formal-students	42	23
	Formal-displaced students	1	1
	Formal-student stress	2	1
	Formal-value-added students	4	3
	Unsuitable evaluation form	9	6
	Ideally external	2	2
	Lack of funding	2	2
	Necessary	8	5
	Through research	4	2
	No quality assurance	13	8
	No research	1	1
	No PI evaluation	24	12
	Little feedback on the PI	2	1
	Excellence in teaching award	7	5
	Problem students marks 1 activity (PI)	2	1
	Aims to do it	4	1
	Peer promotion	5	3
	Ethical reason	2	1
	Student success in examinations	2	2
	Alone	8	3
	Evaluation	260	152
Propagation	Throughout Quebec	3	2
	Other departments/faculties	9	8
	Other universities	3	2
	Faculty students	5	3
	Unknown	7	6
	Not important	5	5
	Used by one or more professors	10	7
	Propagation	42	33
Consequences	Articles	25	14
	Oral communication	13	7
	Aims to publish	3	3
	Study	1	1

Optional stage	Sub-theme	Frequency¹	Instance²
(Consequences, continued)	Book (individually)	4	3
	Group book	6	3
	No publication	25	14
	Not the aim	3	3
	Time/Resources Research-publications	3	3
	Consequences	83	51

1 Frequency is the number of segments coded as relating to the sub-theme.

2 One instance is one interviewed professor participating in this research. Here, this column shows the number of instances (i.e., professors) with one or more segments coded to the sub-theme.

Appendix C: Interest in the Eight Optional Stages of the Pedagogical Innovation Process

