Chapter #21

INTERDISCIPLINARY PROJECTS IMPLEMENTED IN THE ENTREPRENEURIAL SCHOOL
Four crucial steps

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ABSTRACT

Entrepreneurship education appears to be a promising avenue for developing entrepreneurial skills (e.g., leadership, motivation, teamwork) and the school is targeted because young people are considered as key players in promoting economic growth (European Commission, 2013). One of the appropriate teaching methods for achieving academic and entrepreneurial goals is the project-based learning (P-BL). The P-BL is also the prioritized strategy to implement interdisciplinarity in schools and it appears that entrepreneurship is a privileged context for realizing interdisciplinary projects in order to give meaning to the learning experience. Based on the framework of Proulx (2004), the objective is to describe the processes of implementation of interdisciplinary projects in the context of the entrepreneurial school. Eight individual interviews were conducted with school staff from one entrepreneurial school. Our results show that the teacher assumes a key role as a supervisor throughout the interdisciplinary project in making sure that the education program objectives are achieved. However, the lack of collaboration between the teachers remains a challenge in order to help them with the realization of these projects. Interdisciplinary projects correspond to a non-traditional and promising method of teaching; solutions are identified in the discussion to optimize the implementation and thus ensure the sustainability of these projects in this entrepreneurial context.

Keywords: interdisciplinarity, project-based learning, entrepreneurial school, qualitative methodology, case study.

1. INTRODUCTION

One of the primary goals of the school is to promote the educational success of as many students as possible through the three missions proposed by the Ministry of Education of Quebec (Ministère de l'Éducation du Québec - MEQ, 2006). The first mission of instruction promotes academic success while the second and third are aimed at socialization and qualification of students, respectively. Educational achievement is thus a global concept that considers students' personal and professional successes (Lapostolle, 2006).

It seems that one of the most important variable that can influence students' academic success is motivation (Nevala & Hawley, 2011). To this end, students who are motivated by learning at school are more involved in the proposed activities, and they actively participate in classes and spend time and effort for the realization of learning activities (St-Pierre, 2013). Hidi (2001) adds that student interest and perceived usefulness would partly determine engagement, quality of learning and academic performance. According to Deci

and Ryan (2000), there are three types of motivation: intrinsic motivation, extrinsic motivation and also amotivation. Intrinsic motivation leads to an activity or project, for example, because it is intrinsically interesting, useful and enjoyable for the person. Extrinsic motivation is divided into four levels from the least to the most self-determined (external, introjected, identified and integrated regulations). Amotivation supposes that a person remains indifferent to an activity and participates in it mechanically and without demonstrating interest. In short, there is no motivation to act. These three types of motivation can be easily observed and transferred to the education community (Deci & Ryan, 2000). For this purpose, learning that is intrinsically motivated by the pupil is superior in terms of quality than extrinsically motivated learning (Lepper, Corpus, & Iyengar, 2005). In this sense, if students complete their school activities by choice and pleasure, the chances of success are higher than doing activities for external reasons or by internal pressure (Guay & Vallerand, 1997). In this context, it is necessary to emphasize on teaching contexts where students can explore, discover and learn while optimizing their intrinsic motivation (Guay & Vallerand, 1997). With this in mind, it is important for teachers to diversify their teaching and assessment practices to promote better learning and support student motivation (Martin & Dowson, 2009). Several initiatives are therefore put in place in schools to promote educational success and support the motivation of students, including entrepreneurship education.

2. BACKGROUND AND CONTEXT

A promotion of entrepreneurial culture has been taking place in different countries to stimulate and diversify economic growth. This tendency is present, among others, in Europe (European Commission, 2013), United States[1] and Canada (Secrétariat à la Jeunesse, 2004, 2016). It seems that entrepreneurship education appears to be a promising avenue for developing entrepreneurial skills among young people, such as leadership, motivation, teamwork (European Commission, 2013; Ministère de l'Éducation, du Loisir et du Sport - MELS, 2006). The school is targeted in order to give tools and develop entrepreneurial spirit and skills among young people because these are considered as key players in promoting economic growth (European Commission, 2013; Secrétariat à la Jeunesse, 2016).

It seems that the appropriate teaching method for achieving academic and entrepreneurial goals is the project-based learning (P-BL) (Ministère de l'Éducation, du Loisir et du Sport - MELS, 2005). Proulx (2004) defines project-based learning as a process of acquiring and transferring knowledge in which the student must anticipate, plan and realize an observable project. Blumenfeld and his colleagues (1991) and Thomas (2000) add and emphasize that there are two essential components to realize the projects at school. The first one is that there must be a starting question or a problem to solve in order to organize and conduct the activities. The second is that the realization of these activities must lead to a final product. Project-based learning, according to Perrenoud (1998), is a class-led collective enterprise that leads to concrete production. This enterprise includes a set of tasks in which students have to get involved and play active roles. In this line of thought, school entrepreneurship is precisely a project culture in which students act to produce something new (MELS, 2005). The project-based learning is a teaching method that can have positive repercussions for students, such as better understanding of the topic, more in-depth learning, improved communication skills, more effective teamwork and

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[1] https://www.nfte.com/what/mission

greater motivation to learn, among others (Bell, 2010, Proulx, 2004). From this perspective, the realization of these projects increases the interest and motivation of the students because they can solve concrete problems by finding real solutions with their peers (Bell, 2010; Blumenfeld et al., 1991).

The project-based learning is also the prioritized strategy to implement interdisciplinarity in schools (LeDoux, 2003), and Hasni (2010) adds that the P-BL is the teaching method that better characterizes interdisciplinarity. According to Mansilla (2005), interdisciplinarity allows the integration of knowledge and the thinking patterns of two or more school subjects in order to produce cognitive advancement, such as solving a problem or creating a product. Lenoir (2013) adds and states that interdisciplinarity as the action of linking several disciplines at the curricular, didactic and pedagogical levels and the establishment of different links of complementarity and cooperation in order to promote integration of learning processes and knowledge. Hasni and his colleagues (2008) emphasize that interdisciplinary teaching is based on utilitarian purpose, that is translated through the link with the concrete and life outside the school context and pedagogical-affective purposes, such as increasing student motivation and diversification of pedagogical approaches.

3. RELEVANCE AND OBJECTIVE

To our knowledge, there have been few studies that have addressed the qualitative perspectives of school staff in order to have a thorough understanding of the processes and steps involved in implementing interdisciplinary project in the context of entrepreneurial school. It appears that entrepreneurship is a privileged context for the realization of interdisciplinary projects in order to help the student to give meaning to the learning experience, acquire new knowledge (Pépin, 2011) and increase motivation (European Commission, 2013; MELS, 2006). The report of the European Commission, Education, Audiovisual and Culture Executive Agency and Eurydice (2012) reiterates Pépin's (2011) findings and highlights that the majority of educational activities implemented to develop entrepreneurial skills use interdisciplinary methods. Thus, the objective of this study is to describe the processes of implementation of interdisciplinary projects in the context of the entrepreneurial school.

4. CONCEPTUAL FRAMEWORK

The steps for project implementation developed by Proulx (2004), inspired by LeDoux (2003), serve as theoretical and methodological foundations for this study. This conceptual framework consists of four steps related to the implementation of pedagogical projects: (1) Preparation, (2) Implementation, (3) Evaluation, and (4) Disposition. The first step aims to clarify the educational intention, to choose the themes of the project and to structure the major stages of it. When the project is implemented, it's necessary to create student teams to be able to collect all the information and resources available (step 2). At this step, an emphasis is placed on project coordination and supervision from the teacher's point of view. During the third step, evaluation processes are also implemented by the types and the evaluation methods being used. The project concludes with the disposition and presentation of the project to the class, to the school and/or to the community (step 4).

5. METHODS

This research prioritizes a qualitative case study methodology that focuses on a limited number of cases that are considered significant given the specific objective of the study (Merriam, 1988). This descriptive case study aims to describe a phenomenon in depth in its real-world context and to adopt a linear-analytic structure (Yin, 2018). In this study, the case is an entrepreneurial school where teachers have prioritized project-based learning to implement interdisciplinarity. The school welcomes students from elementary to secondary levels and integrates an entrepreneurial component into its success plan and uses educational projects, in which many interdisciplinary projects have been deployed for more than five years. It should be noted that there was a first phase of this research project where focus groups were conducted with school staff members of the school (principals and teachers). Two main objectives were targeted during this first phase: 1) describe the perceptions of interdisciplinarity by school staff as well as the facilitating and binding conditions for the realization of interdisciplinary projects; 2) describe the methods of collaboration of the educational community and teaching practices related to the realization of interdisciplinary projects. Following the analysis of the results of this first phase, we carried out a second phase of the project to examine in greater depth some aspects related to the implementation of interdisciplinary projects and this chapter refers to this one.

For this specific study, we conducted eight individual interviews with school staff (principals and teachers) in order to meet the specific objective of this study. We made sure to have a representativeness of the school environment according to the school levels, the subjects taught and the functions of the key players (principals, tutors, specialists). This type of interview gathers the opinions and points of view of participants to facilitate understanding and interpretation of realities (Poupart et al, 1997). This instrument allows deepening and understanding of the studied phenomenon since it focuses and gives direct access to the lived experience of participants (Savoie-Zajc, 2009, Yin, 2018). The interview is an essential instrument to use in a case study because we are primarily interested in the human being and his actions (Yin, 2018). The individual interviews included 18 questions aligned with Proulx's four steps (2004). More specifically, the first step (preparation) involved five questions, the second step (implementation) included seven questions, the evaluation (step 3) was discussed through three main questions and the disposition (step 4) was discussed via three questions. Before conducting the individual interviews for this study, we validated the interview questions with a representative sample of our participants. The duration of these interviews varied between 25 minutes and 61 minutes and they were recorded.

The qualitative data were analyzed using Boutin's strategy (2007). This method of Boutin (2007) is divided into four stages: 1) preliminary readings of the data and establishment of the list of statements; 2) grouping statements into predetermined categories (based on a conceptual framework); 3) identification of sub-categories; and 4) interpretation and description of results. This analysis procedure uses predetermined categories in the literature. For this study, Proulx's (2004) four steps (preparation, implementation, evaluation, disposition) are the starting categories and the NVivo 10 software was used as a support to conduct these analyses. A validation process (with two judges) was achieved and the percentage obtained was 95%, as recommended by Yardley (2008). Following these analyses, we were able to interpret the data by generating explanatory propositions of the studied case (Gagnon, 2005).

6. RESULTS AND DISCUSSION

6.1. Preparation

Our results show that the teacher assumes a key role as a supervisor throughout the interdisciplinary project preparation in making sure that the education program (EP) objectives, the competencies related to the school disciplines involved in the projects and the goals of entrepreneurship are achieved. A teacher makes this observation: "*When you develop an interdisciplinary project, everyone (every teacher) must be taken into account because there is a specific curriculum to be followed in each discipline [...] we have to make sure to include the key elements of the content for each targeted school subject*" (Teacher 1). LeDoux (2003) has rightly emphasized the key role of the teacher as a pedagogical supervisor between the student and the learning to be acquired in the project. For his part, Proulx (2004) points in the same direction by emphasizing that the teacher has four main roles in project-based learning (coach, facilitator, motivator, evaluator) and that through these roles, he must ensure that there are learnings made throughout the project. First and foremost, the interdisciplinary project must meet the disciplinary and entrepreneurial objectives in order to take advantage of the potential of this type of project. It is important, however, to give some latitude and autonomy to the students in the choice of the theme or subject to be exploited in the project in order to raise their intrinsic motivation from the beginning of the project (Bell, 2010; Proulx, 2004).

6.2. Implementation

According to the participants, there are interesting collaborations mainly between specifically secondary teachers, which greatly facilitate the integration of several school subjects into interdisciplinary projects (Hammond & McCallum, 2009). On the other hand, the lack of collaboration between the elementary teachers remains a challenge in order to help them with the realization of the interdisciplinary project. To this end: "*It is not strong [the collaboration], there is none. We are all caught up in our own project [...] but when you are in a project, to help the other in his/her project, it is difficult*" (Teacher 5). In our judgement, it is necessary to increase collaboration between school staff members. In this regard, Hasni (2010) highlights that one of the most important conditions for the implementation of interdisciplinarity is the commitment and availability of teachers to work together during the project. We could more emphasize the importance of this collaboration in preservice teacher education programs so that this practice would be more present and valued. Why not take advantage of teaching internships so that students can work on an activity or a project where the collaboration between teachers would be put in the foreground? This avenue linked to preservice teacher training needs to be deepened.

6.3. Evaluation

Teachers take advantage of the implementation of interdisciplinary projects to evaluate students. The assessment is meant to support student learning (formative evaluation) and recognition of competencies (summative evaluation) functions (Fourez, Maingain, & Dufour, 2002). During the implementation of interdisciplinary projects in the entrepreneurial context, teachers tried to match the assessment of school disciplines and entrepreneurial skills to achieve the goals of the EP and the objectives of entrepreneurship and thus maximize the potential of these projects. Based on analyzes of interviews, participants found that the interdisciplinary projects are a non-traditional method of teaching and this result is consistent with the literature (Hasni, 2010) that interdisciplinarity

is associated with risk teaching contrary to traditional and disciplinary teaching. One teacher stated: "*Yes it can be difficult to manage [interdisciplinary projects in an entrepreneurial context] because we are more in a traditional classroom but it is another learning process that can be very interesting*" (Teacher 1). According to the participants, this way of teaching by interdisciplinary project brings interesting effects on students: "*The project develop their motivation, involvement, autonomy, responsibility and I think they take consciousness [the students] that there are learning they need*" (Teacher 6). It is interesting to note from this result that the effects mentioned refer to both, academic learning and the development of entrepreneurial skills. This finding agrees with the literature in relation to the positive consequences of this type of project, including increased intrinsic motivation of students (Bell, 2010; Hasni et al., 2008). In this line, project-based learning is an engaging and motivational approach for students that promotes involvement, interest and investment in learning (Bell, 2010).

6.4. Disposition

For this final step, it is important to present the outcome of the project to the school and community members and even parents who were project partners: "*First, the school council, which is partly composed of parents, is informed of the progress of the projects. It is a mode of diffusion. [...] and we have an open house day in May inviting the whole community*" (Principal 2). This step is important since the first goal is to arrive at a concrete product at the end of the interdisciplinary project (Perrenoud, 1998) and thanks to these formal presentations, the students are motivated to carry out the project in order to have an interesting product to present to their family, friends and community members. In other words, from the preparation to the project's disposition, the teacher must find interesting pedagogical formulas to support student motivation. A formal discussion is also held at the end of the project between the teacher and the pupils in order to go over the learning that developed in relation to the disciplines and the entrepreneurial skills. Asked about the desirable improvements to be made to encourage the implementation of interdisciplinarity, a recommendation draws our attention that it can be difficult for a teacher who starts in an entrepreneurial school to implement an interdisciplinary project in addition to performing all the other tasks expected in education: "*More released time to work with a student committee, to set the stages, to set a timetable. We move forward and try to close things up as we go along. Long-term planning is not possible*" (Teacher 3). This observation emphasizes the importance of closer collaboration between teachers in order to share teaching strategies (Erickson, 1996) and reduce isolation, among others (Pompson, 2005). Moreover, this observation reiterates the importance of emphasizing the possibilities and modalities of collaboration between teachers at the preservice teacher training program.

7. FUTURE RESEARCH DIRECTIONS

It would be interesting to gather pupils' perceptions of the process surrounding the implementation of interdisciplinary projects in the context of the entrepreneurial school. The students are considered as key players in these projects and their point of view is important to achieve the academic and entrepreneurial objectives and to ensure the sustainability of these projects. Focus groups could be conducted to gather their viewpoints on the integration of interdisciplinarity into projects. With this in mind, it would be important to see the long-term impacts of these interdisciplinary projects in terms of learning development and entrepreneurial skills, whose primary goal is to combine interdisciplinarity and entrepreneurship.

8. CONCLUSION

Using Proulx's (2004) theoretical framework, the aim of this study was to describe the implementation processes of interdisciplinary projects in the context of an entrepreneurial school. Following the discussion, each step brings its own challenges in line with the consolidation and sustainability of interdisciplinary projects in an entrepreneurial context. It seems that the steps related to implementation (step 2) and evaluation (step 3) are more complex and require more time and planification from the teachers than the other steps. In relation to the lack of collaboration (step 2), it would be interesting for the teachers of the same cycle (e.g., 3rd and 4th years) to be able to carry out an interdisciplinary project together in order to share the tasks (and thus reduce workload) and find solutions together for the problems encountered. Thus, the benefits would be numerous for both teachers and students. The teachers try through the interdisciplinary project to evaluate learning related to school subjects and entrepreneurial skills (step 3). It would be important to have formal meetings between teachers to ensure appropriate evaluation of learning from the disciplines (according to the EP) and the development of entrepreneurial skills. In other words, a reorganization of the work by the employer to facilitate the collaboration between teachers is essential to implement a pedagogical innovation as the interdisciplinary project in the entrepreneurial school. Despite the fact that the implementation of interdisciplinary projects represents a non-traditional teaching method, the combination of interdisciplinarity and entrepreneurship is profitable to encourage the development of disciplinary learning and entrepreneurial skills, such as motivation. Entrepreneurial school is an innovative context and Proulx's (2004) four steps provide a good description of the implementation of interdisciplinary projects.

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