

Nurturing Opportunity Identification for Business Sophistication in a Cross-disciplinary Study Environment

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ABSTRACT

Opportunity identification is the key element of the entrepreneurial process; therefore the issue of developing this skill in students is a crucial task in contemporary European education which has recognized entrepreneurship as one of the lifelong learning key competences. The earlier opportunity identification becomes a habitual way of thinking and behavior across a broad range of contexts, the more likely that entrepreneurial disposition will steadily reside in students. In order to nurture opportunity identification in students for making them able to organize sophisticated businesses in the future, certain demands ought to be put forward as well to the teacher – the person who is to promote these qualities in their students. The paper reflects some findings of a research conducted within the frameworks of a workplace learning project for the teachers of one of Riga secondary schools (Latvia). The main goal of the project was to teach the teachers to identify hidden inner links between apparently unrelated things, phenomena and events within 10th grade study curriculum and connect them together and create new opportunities. The creation and solution of cross-disciplinary tasks were the means for achieving this goal.

Keywords: opportunity identification, cross-disciplinary teaching and learning, the development of students' entrepreneurship.

1. INTRODUCTION

Opportunity identification is widely viewed as one of the key elements of entrepreneurship education; according to Howard Stevenson: “entrepreneurship is the pursuit of opportunities beyond the resources you currently control” [32]. Traditional teaching methods such as lectures, literature reviews and examinations do not activate students' entrepreneurship [11, 30, 14, 13]. It is argued that the most effective way to promote students' entrepreneurial dispositions and mindsets is to “push” students into entrepreneurship through the structuring of learning like an entrepreneurial process [16, 20, 33, 15]. Then students actively interact with the environment and different life situations based on their knowledge, skills, personal needs, desires making their learning vital [18]

and pass through all the stages of the entrepreneurial process started from opportunity identification or creation till its realization into new values [21].

It is argued that the development of students' entrepreneurship shouldn't be considered only in the context of learning economics, management, business, etc, which are study disciplines traditionally connected with entrepreneurship, but as stated by Allan Gibb, entrepreneurship should be taken out of the “locker room of economics”, and based “within a wider interdisciplinary context with a pluralistic and diffused view of society” [11]. As life itself is not mono-disciplinary, the idea of developing entrepreneurship in cross-disciplinary study environment which is maximally approximated to the real life is the prerequisite of entrepreneurship promoting education which is embedded across and within different subjects. Hannon argues that the codification of knowledge into distinct “subjects” creates challenges for cross-disciplinary notions of entrepreneurship as a state of being, or as a process of change or development. When subjects are translated into formalized courses for teaching, they are often “full” of subject “content”. Enterprise or entrepreneurship outcomes largely remain peripheral [12]. Therefore training for entrepreneurship by necessity must actively deal with the multiplicity of becoming, which is life, by sensitive conversations with local situations [15]. For that it is essential to build projects and programs across disciplines [36] and make students members of cross-curricula teams [27].

Therefore the project analyzed in this paper intended to give a boost both to teachers and students for starting certain thinking and behavioral habits – to recognize inner causal links and connections between things and phenomena which couldn't be noticed at first sight or even expected, if based on traditional way of teaching and learning of physics, music, mathematics, biology, history, literature, chemistry, geography, languages, etc. Both quantitative and qualitative data were acquired in the course of the reflection and survey of the teachers and their students in different stages of the project. “The model of opportunity identification and creation in cross-disciplinary teaching and learning environment” was elaborated based on the theoretical analysis of literature and on the outcomes of the quantitative data processing as well as of the content analysis of the text made of the respondents' comments.

2. OPPORTUNITY IDENTIFICATION AND CROSS-DISCIPLINARY TEACHING AND LEARNING

The analysis of different opportunity theories reveals the lack of conceptual clarity and the inconsistency in defining the key constructs of opportunity, as even the origination of opportunities is explained in different ways. Scholars argue that opportunities are:

- recognized [2, 7, 28];
- perceived [31];
- discovered [17, 35];
- created [25, 26];
- identified [5, 6, 19, 22];
- developed [1, 24].

Despite the variety of the conceptual approaches, they are somehow complementary as they lay emphasis on different aspects, stages and factors of opportunity, started from its emergence till its formation and development. However there are certain contradictions. While the proponents of opportunity recognition argue that opportunities “exist out there” and the role of entrepreneurs is to recognize them [7], the opponents of opportunity recognition criticize this approach calling it as misleading, since it implies that opportunities are “out there” waiting to be found [1]; thus it assigns opportunity an instantaneous character [24]. On the opposite to “opportunity recognition” end are those who are for “opportunity creation”. Sarasvathy et al. consider that opportunities do not pre-exist –either to be recognized or to be discovered. Instead they get created as the residual of a process [25]. Gartner et al. also are for the active behavioral approach to creating opportunities; they argue that opportunities are the result of what individuals do, rather than the result of what they see [10]. Thus, as stated by Shackle individuals are the only source of opportunities as through their imagination they can create opportunities from almost nothing by using their mind [26] and acting upon them.

Concerning the “perception of opportunities”, there is a point of view that the procedure of perceiving opportunities must be comprehensive enough to serve as a cognitive objective for the entrepreneur [31]. However, researches show that initial perception of opportunities is often rudimentary, and most opportunities are developed – both before and after venture foundation. This provides evidence for the conceptualization of “opportunity” in terms of “opportunity development” [24]. Long & McMullan describe opportunity identification as a creative structuring process [19].

The authors share the standpoint that “opportunity identification is a more inclusive term that encompasses both potential opportunities already existing in the environment and opportunities that are created by entrepreneurs” [5, p. 367]. So, opportunity identification concerns both external – objective environmental and internal – subjective human factors. Opportunity identification is a cognitive task [29] which is related to education, work experience and entrepreneurial

experience [4]. For entrepreneurs it’s very important to creatively interpret the external environment and relate the opportunities identified in it to their own knowledge corridor [6]. Prior knowledge plays a significant role in the discovery perspective of opportunities [24], as people notice information that is related to their existing knowledge [9]. Moreover, in order to be useful, new information often needs to be complemented with prior knowledge [29]. As prior knowledge of people is inevitably different, according to Stefan Sanz –Velasco that is the main reason why no two individuals perceive exactly the same opportunity [24]; each person’s prior knowledge enables the person, but not others, to recognize certain opportunities [34].

Robert A. Baron has complemented prior knowledge and experience with two more factors: 1) an active search for opportunities and 2) alertness to opportunities, which is the capacity to recognize them when they emerge; these three factors together play a crucial role in opportunity recognition [2].

When working with the teachers of 18 different study disciplines in the cross-disciplinary study environment within the workplace learning project in the above mentioned Riga secondary school, new opportunities were recognized, identified, created and developed by applying procedures from one area of knowledge to another, giving rise to novel associations and these associations enabled them to form the basis of creative ideas [23]. When the teachers were engaged in analyzing problems from one study discipline through others and finding hidden links between apparently unrelated things, phenomena and events and connected them together and created new vision and facets of the reality, it broadened their perception, interpretation, and understanding of environmental forces which according to Dutta and Crossan make the basis for creativity and opportunities not only to be identified but also to be developed and evaluated, that is to be enacted [8].

When a problem from literature was considered through physics, sports, health and chemistry; a problem from biology - through music, handicraft, design and history or a story from mythology – through geography, logics, mathematics and biology in a non-traditional way, it gave rise to the creation of cross-disciplinary problems, which already were new opportunities created by the teachers and aimed at “pushing” studies closer to real life situations and at making all the teaching and learning more attractive and full of discoveries. This approach to the identification and creation of opportunities is justified first of all by a method well known in history and popularized by Thomas Edison; its main idea was to seek to “discover” an invention by combining two items at a time [6]. A few decades later Edward de Bono used “Random entry” technique of lateral thinking which is similar to the above described Edisonian approach to innovation aimed at the creation of new ideas for solving practical problems [3]. However the technique of the identification and creation of new opportunities used in this project had a principal difference from the ones

offered by Edison and de Bono. While looking at a problem of one discipline through the prism of other disciplines, the character of links and interconnections discovered, despite being unexpected and non-traditional, yet were not of “random” but, on the contrary, of “deeply causal” character. A special emphasis was placed on the generation of ideas by seeking links between problems across study disciplines which are classified within different science groups. This served as a ground for the elaboration of “The model of opportunity identification and creation in cross-disciplinary teaching and learning environment” (see fig. 2) which will be considered in the next chapter.

3. THE COURSE OF THE RESEARCH

The project was realized and the research was conducted in three main stages:

1. The introduction of the idea and analysis of the essence of cross-disciplinary studies to the teachers who participated in the project and their training;
2. The creation of cross-disciplinary problems by the teachers in groups with their colleagues who teach other disciplines;
3. The solution and analysis of the teachers’ cross-disciplinary problems together with their students.

The first stage of the project

It consisted of six phases:

a) While the teachers were presented theory and practice of cross-disciplinarity, special attention was paid to the non-traditional links between parts of the problems based on disciplines from different science groups; it was as well accompanied with the comments on what skills and qualities they may develop.

b) It was analysed and ascertained that ideas for cross-disciplinary problems can be found absolutely everywhere in real life situations and the main problem here is that most people are not used or trained to recognize them.

c) The teachers were offered to create their own ideas for cross-disciplinary problems. For that they were supposed to:

- write down five things, phenomena or events which attracted their attention that day;
- decide in what way these five items could be integrated with the themes of the lessons in study disciplines which they teach;
- relate these themes from their disciplines and the problems behind them to three and more other study disciplines – the farther from theirs the better.

d) The teachers were offered to analyse cross-disciplinary problems which had been created using statistical information taken from the “Worldometers: World statistics updated in real time” [37].

e) The teachers formed three groups and trained to create their own cross-disciplinary problems by using data from the “World statistics updated in real time” [37].

The findings of the research conducted in the first stage of the project

The teachers who participated in the project were surveyed with the aim of making a comparative analysis of the advantages and disadvantages of, on the one hand, traditional studies in which the study content is divided into separate disciplines and, on the other hand, of cross-disciplinary studies. The quantitative aspects of the research are shown in table 1.

Table 1. The results of the survey of the teachers on the advantages and disadvantages of the traditional separate-subject studies and the cross-disciplinary studies

Type of studies	+ / -	Aspects	No. of respond. (%)
Traditional separate-subject studies	Advantage	Easy to teach	38
		Easy to perceive for students	19
	Disadvantage	Low potential for creativity	62
		Far from real life context	43
Cross-disciplinary studies	Advantage	Ample opportunities for creativity	67
		Studies are very close to the real life	62
	Disadvantage	Difficult to create cross-disciplinary problems by a single teacher alone	43
		For students may be difficult to comprehend such problems	24

Table 1 shows that despite the difficulties of providing cross-disciplinary studies, it is closer to the real life and has greater potential for creativity.

In the course of the qualitative content analysis of the text made of the teachers’ comments, a few significant aspects of the cross-disciplinary studies which concern opportunity identification emerged out of the teachers’ experience. Having analysed and integrated the results of the quantitative and qualitative researches, the findings of the first stage were finalized as follows.

1. While traditional studies make students concentrate their attention on separate disciplines, cross-disciplinary studies encompass all of them and connect them together as a whole, enabling students to discover new dimensions for thought and activities, perspectives and possibilities for unexpected solutions of real life problems.

2. Cross-disciplinary studies require a special preparation of teachers and a new quality of cooperation among teachers of different study disciplines, as it’s not real for a single teacher to be competent in all areas in order to create valuable cross-disciplinary problems or solve them.

The second stage of the project

It was aimed at the team work of the teachers who split up into three groups:

Group 1 consisted of six teachers of different languages and a teacher of biology;

Group 2 was formed by teachers of mathematics, handicraft, native language, sports, physics, music and social sciences, one teacher from each discipline.

Group 3 was represented by teachers of mathematics, native language, foreign languages, history and philosophy, economics, geography and dancing.

The authors as the leaders of the above mentioned project, asked the teachers to form mixed groups from teachers of diverse disciplines. However it was the teachers' free choice to get grouped in the way they see it. Each group was to create their own cross-disciplinary problem, based on the topic chosen by them during a two-week time period. In the end of this stage, all the three groups were supposed to demonstrate their problems to the other participants of the project and analyse them together.

The findings of the research conducted in the second stage of the project

This stage of the project revealed the hindrances which may occur in the process of the active inclusion of cross-disciplinary studies into educational practice.

1. Those teachers, who had worked in school for a long time teaching one or two disciplines, especially from the group of human sciences (group 1), were used to think and act within the frameworks of their study disciplines to such an extent, that for them it caused certain difficulties to "step out" across the boundaries and cooperate with those colleagues who were from other science group.

2. Instead of creating really cross-disciplinary problems in close cooperation with their colleagues, the teachers of group 1 tried to substitute the idea of cross-disciplinary problems by the compilation of independent questions and tasks from the themes which they were teaching in school in that period.

3. While analysing the cross-disciplinary problems, all the participants of the project agreed that the more captivating and many faceted were those problems, which had been created by the groups of teachers of disciplines traditionally recognized as "remote" from each other (groups 2 and 3). This conclusion was confirmed as well in the third stage of the project on the basis of the survey of the students who had been offered to solve these problems and evaluate their studies during the project. As for the teachers, in their reflection on what they had acquired while learning to solve and create cross-disciplinary problems, among the other acquisitions, they emphasized as well that they had become more perceptive towards things, seeing hidden aspects of them which they wouldn't have paid attention to before.

The third stage of the project was the work with the students who solved and analysed the cross-disciplinary problems created in the second stage. It lasted three days, one day for each cross-disciplinary problem created by each group of teachers. The reflection of the students was organized at the end of each day, as the problems were very different in their content, character and the means which were necessary for their solution. The course of the research was filmed for the further analysis and for being used as a methodical material for cross-disciplinary teaching and learning.

The findings of the third stage of the research

The students' reflection first of all confirmed a high level of positive emotional perception of the cross-disciplinary learning by the students during all the three days. However there was one important tendency which emerged after having processed the quantitative data (see fig. 1 and 2).

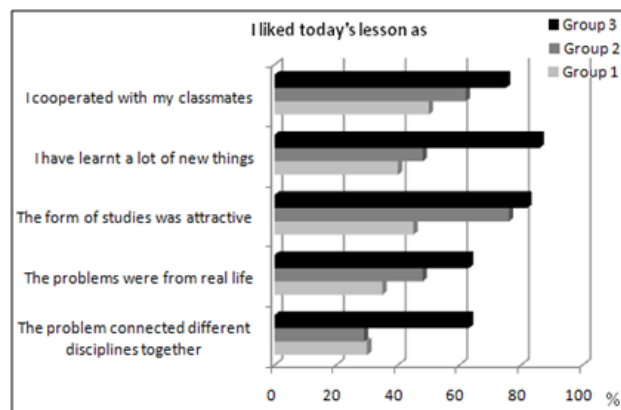


Fig. 1 The students' reflection on why they liked that day's lesson

The diagram in figure 1 shows that the students liked better and evaluated higher the cross-disciplinary lessons provided by those groups of teachers who represent more diversity of disciplines (groups 3 and 2).

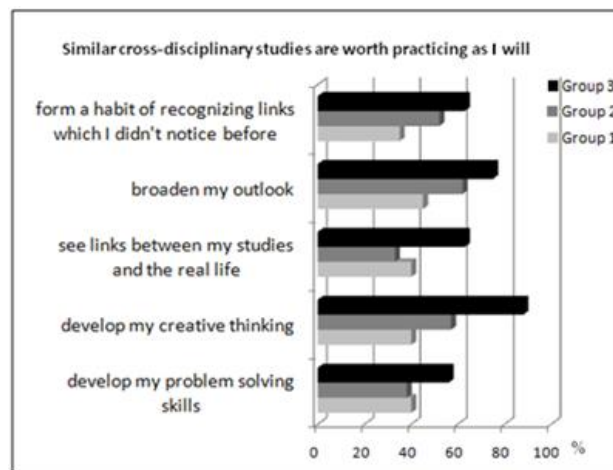


Fig. 2 The students' reflection on why they think that cross-disciplinary studies are valuable

The diagram in figure 2 reveals that in the end of each of the three days the students evaluated that type of cross-disciplinary studies to be a real value as means for developing different skills, including the habit of recognizing links between things and phenomena, which couldn't have been noticed before. However, more value was seen in the lessons delivered by the teachers of groups 2 and 3, who represented more diverse disciplines than in group 1.

Having summarized all the findings, "The model of opportunity identification and creation in cross-disciplinary teaching and learning environment" was elaborated (see fig. 3).

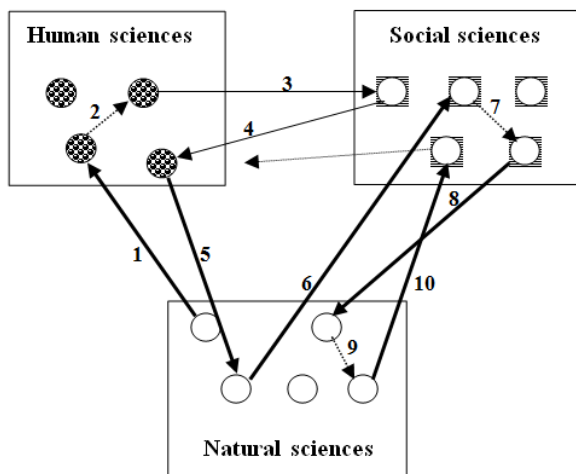


Fig. 3. The model of opportunity identification and creation in cross-disciplinary teaching and learning environment

It shows that the links between study disciplines within one group of sciences (see links 2, 7 and 9 in fig. 3) and between "Human sciences" and "Social sciences" (see links 3 and 4 in fig. 3) are more traditional and apparent; therefore the level of innovativeness of the idea created on these links aren't very high. Meanwhile the links between study disciplines across different science groups, especially between "Natural sciences" and "Social sciences" (see links 6, 8 and 10 in fig. 3) and between "Natural sciences" and "Human sciences" (see links 1 and 5 in fig. 3) traditionally are admitted to be less related and therefore less apparent. This is where the teachers' as well as of their students' ability to connect seemingly unrelated and independent things, phenomena and trends in order to identify and create new opportunities could be developed more successfully. The model doesn't show specifically with which study discipline or which science group the cross-disciplinary studies should start or opportunities should get identified or created. It has a kind of symbolic character to manifest how "intra" and "inter" links are formed and the gaps between seemingly independent areas are overcome; moreover, the bigger the gap the more innovative the idea and opportunity turn out to be.

4. CONCLUSIONS

1. Cross-disciplinary teaching and learning are an appropriate means for developing both teachers' and their students' skills and habits to identify and create opportunities by discovering hidden links between apparently unrelated things, phenomena and events from different study disciplines.
2. In order to provide cross-disciplinary teaching and learning environment, teachers' education should be revised and reorganized and new level of cooperation among teachers of diverse study disciplines should be established.

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