

LEARNING AND TEACHING THE BUSINESS MODEL: THE CONTRIBUTION OF A SPECIFIC AND DEDICATED WEB APPLICATION

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ABSTRACT

The success of the Business Model (BM) as a practical concept makes it a promising tool for entrepreneurs to shape a more challenging environment. As teaching BM design to students appears essential, we have developed a specific web learning application based on actionable theoretical developments. The web application is called GRP Storyteller, from the GRP BM it is based on (www.grp-lab.com). We assess the perceived quality of the web application through a survey among 281 non-business students enrolled in seminars introducing entrepreneurship. Students were asked whether the application facilitates the learning of the BM according to various pedagogical objectives. They also evaluated its design, organization and user-friendly qualities. The results show that the application improves the learning of the BM by helping students remember, understand and apply conceptual knowledge.

Keywords: Business Model, Web Application, Pedagogical Tool, Learning By Doing, Evaluation, Non-Business Students

INTRODUCTION

The Business Model (BM) emerged in the early 90s as a new concept enabling entrepreneurs to make their innovative e-businesses understandable for resource holders in the specific context of the New Economy. The use of the BM concept spread among practitioners far beyond the frontiers of Internet economy since it more generally meets entrepreneurs' needs for new and efficient tools in more challenging environments: higher competitiveness including competition for resources, increased use of ITCs, unstable economic contexts (Leschke, 2013; Bocken et al., 2013). For practitioners, the BM is much more than a buzzword. The environment, i.e. the employers, lenders, investors, expects entrepreneurs to know about it. The BM has been used by economic stakeholders for over 25 years and has gradually become a research theme, as shown by an increasing number of works that aim at either conceptualizing or instrumentalizing it (for a literature review, see Zott et al., 2010). The concept has now found its place in renowned journals (George and Bock, 2011, Morris et al., 2013) and is sometimes featured in special issues (Long Range Planning 2010). It even has its own specialized academic journal (Journal of Business Models).

This longevity in practice and in research makes this concept more important than a simple 'management fad' (Gibson and Tesone, 2001), which justifies its appearance in the curricula of entrepreneurship courses. Moreover it meets the need for more innovative pedagogical tools in entrepreneurship education (Carrier, 2008; Neck and Greene, 2011; Jackson

et al., 2015). At least two different experiments involving the BM can be related to the educational field. Using the BM in an introduction to an entrepreneurship course at the University of Wisconsin (USA), Leschke (2013) makes a comparison between techniques used for business modeling and business planning. Although the business plan is a more common and expected format both in entrepreneurship education and in the business environment, the experiment hypothesizes that the BM is an effective alternative for grasping a business opportunity more quickly and effortlessly. Leschke points out that students and instructors using the BM appreciate the limited effort involved in starting a business design, the small amount of knowledge required to start making decisions and the increased awareness of interrelations between the functions of the firm. Another experiment suggests that artifacts (such as Osterwalder and Pigneur's BM Canvas, 2009) may facilitate team development for new BM ideas (Eppler and Hoffmann, 2013). Based on an empirical study with managers attending an executive MBA course at a Swiss university, the results show that artifacts have the potential to increase perceived collaboration whereas they decrease perceived creativity.

However, the tools used in pedagogy are more practical than theoretical. As academic teachers in entrepreneurship courses, we needed to rely on a BM approach, strongly embedded in entrepreneurship academics and not only stemming from existing practitioners. In this perspective, our research team, which is supported by public funding, has developed a new web learning application dedicated to BM teaching. We chose the GRP BM, which is rooted in theory and specifically designed for entrepreneurs. The value created by and for the organization and the value exchanged within the stakeholders' network are central to the GRP BM, which is consistent with the BM academic literature. In this research, the BM is defined as a shared representation of the Generation of value (G), the Remuneration of value (R) and the Participation in value exchanges (P) (Verstraete and Jouison-Laffitte, 2011a). Through this collective representation, every stakeholder in the network understands how he contributes and what he can draw from his participation in the project. This representation is a dynamic way of modeling the business that goes way beyond the economic model with which it is too often limited. The web application is called GRP Storyteller (freely accessible on: www.grp-lab.com). GRP Storyteller was developed to help students coached by teachers (and, more generally, entrepreneurs coached by mentors) in their efforts to specify their BM in order to get stakeholders onboard their project. Step by step, the students/entrepreneurs build and specify their BMs by telling the story of their business.

In this paper, we aim at assessing the perceived quality of this dedicated web application. We decided to consider this quality of the application both in terms of content and form, by analyzing its pedagogical dimension and ergonomic. This implies (1) finding out whether it facilitates the learning of the BM according to various pedagogical objectives: remembering, understanding and applying the concept (relying on Bloom's taxonomy revised by Krathwohl, 2002) and (2) examining how students perceive the tool, including technical aspects such as design, organization and user-friendliness (Hasan and Abuelrub, 2011; Hsu, Yeh and Yen, 2009; Chandra and Theng, 2009).

We first present the theoretical framework of our research, the literature about the BM and the GRP BM. We then outline our research method based on a survey, particularly the characteristics we chose to study regarding the quality of the web application. Our findings are reported in the results section. Finally, we discuss their contribution to entrepreneurship education.

THEORETICAL BACKGROUND: THE GRP MODEL WITHIN THE BUSINESS MODEL LITERATURE

The increasing number of academic articles that discuss the BM is testimony to the strong interest that this practical concept has aroused since the early 90s. Even if the literature on the BM remains fragmented and sometimes confusing (George and Bock, 2011), some trends are emerging. Around the world, an academic community is conducting research on what a BM is (its nature), what it is made of (its building blocks) and what it is made for (its functions).

The Nature of the Business Model

Zott et al. (2011) note that the terms used to qualify the nature of the BM are very varied. For example, the BM is considered as a “representation” (Shafer et al. 2005; Morris et al. 2013), an “architecture” (Timmers, 1998), or a “system of activities” (Amit and Zott, 2012). For Verstraete and Jouison-Laffitte (2011a), the BM is a “convention” (a collective representation of the business), in reference to the literature of the Economy of Conventions (Gomez and Jones, 2000).

The “Building Blocks” of the Business Model

Some authors define the BM by its building blocks without taking a clear stand on what it really is (Mahadevan, 2000; Applegate, 2001; Alt and Zimmermann, 2001; Hedman and Kalling, 2003). The type and number of building blocks differ from one author to another. Nevertheless, three axes may be established around which these elements cluster, showing - transversally - a striking affinity with the concept of “value”.

The first axis is that of creating value for the market. In order to analyze what value is created, the expression with the most noticeable take-up is “value proposition” (Mahadevan, 2000; Linder and Cantrell, 2001; Chesbrough and Rosenbloom, 2002; Teece, 2010). To study how value is created, Alt and Zimmermann (2001) evoke the « structure » and the « processes » of creation, whereas Applegate (2001) raises the question of « capacities », i.e. the resources needed to cement the BM. « Resources » are also mentioned in many other studies (Hedman and Kalling, 2003; Demil and Lecoq, 2010). In the GRP model, the “Generation of value” (G) dimension includes the “What” and “How” questions. Since its conceptualization resides in the context of firm creation, one of the characteristics of this dimension is also to include a precise description of the entrepreneur himself. The reason for this is that the created value and how it is manufactured depends largely on who the entrepreneur is, in particular at the beginning of an activity. This question is particularly important in SMEs.

The second axis relates to the economic model. It examines revenues flows (Mahadevan, 2000; Stewart and Zhao, 2000; Afuah and Tucci, 2000; Alt and Zimmermann, 2001) and the associated structure of costs (Morris et al., 2013; Demil and Lecoq, 2010) that enable the business to perform well in the long term (Stewart and Zhao, 2000; Rappa, 2000; Petrovic et al., 2001; Magretta, 2002; Morris et al., 2013). In the GRP model, authors Verstraete and Jouison (2011a; 2011b) refer to this economic model as the “Remuneration of value” (R) dimension. Besides the economic durability of the business, they insist on the importance of non-financial performance.

The third axis concerns relations with partners and their interaction in a network: the “potential benefits for the different actors” (Timmers, 1998), the “value flows for the partners”

(Mahadevan, 2000), the “return for investors and other stakeholders” (Applegate, 2001) are some expressions that illustrate this axis. In the GRP model, the “P” represents the “Participation in value exchanges” with stakeholders. The ecosystem itself is one of the model’s building blocks and not only an external constraint. It is the condition for entrepreneurs to design businesses that fit perfectly with their environment and to maximize the creation of value for all the stakeholders.

The Functions of the Business Model

Some authors have a more instrumental vision of the functions of the BM, thus opening the way for a line of research dedicated to the roles of the BM. George and Bock (2011) consider the BM as a “tool”. Rappa (2000) and Afuah and Tucci (2000) describe it as a « method ». Chesbrough and Rosenbloom (2002) are concerned with the BM’s role as an intermediary - they refer to its cognitive role - between technology and the creation of economic value. This perspective is more descriptive and explanatory. It aims at understanding “how” a business manages its activities (Rappa, 2000; Magretta, 2002) and, sometimes more restrictively, how it generates its revenue (Stewart and Zao, 2000; Rappa, 2000). By extension, for some authors, the BM takes on a unifying role that brings stakeholders together around in a common vision of the business’ activities or, at least, around in its value proposition (Gordijn et al., 2000). In this sense, it can be used for exercises that aim at convincing potential stakeholders, particularly clients or investors (Linder and Cantrell, 2001; Magretta, 2002; Verstraete and Jouison-Laffitte, 2011). The BM can also be used as a diagnostic tool (Verstraete et al., 2017) and as a prospection tool (Applegate, 2001; Petrovic et al., 2001; Magretta, 2002; Amit and Zott, 2012).

The GRP Business Model

Among all these conceptions of the BM, we have chosen the GRP model. Since 1999, the GRP model has been developed progressively through action research with entrepreneurs, pedagogical action research and case study research. It qualifies the nature of the BM (a convention), its building blocks (Generation, Remuneration, Participation) and its functions (design and redesign of the BM, storytelling and representation in convincing contexts). The BM is a shared representation that relates to the generation of value, the remuneration of this value and the sharing of value with partners (Verstraete and Jouison-Laffitte, 2011b; Verstraete et al., 2017). Each dimension of the BM (G, R and P) is composed of three dimensions, which are themselves sub-divided in nine components. Compared to existing applications and models, the GRP model considers the entrepreneur as a “variable” of the BM and the environment (the ecosystem and its conventions) is integrated into the design of the business itself. This is particularly relevant in the entrepreneurial context. Figure 1 explains about Building blocks of BM in GRP Model.



Source: Verstraete and Jouison-Laffitte, 2011a; grp-lab.com

Figure 1
BUILDING BLOCKS OF BM IN GRP MODEL

From Theory to Practice: The GRP Storyteller

GRP Storyteller is a web application launched in April 2014 that helps students-entrepreneurs tell the story of their business. Thanks to an integrated word processor, they can write their business story since writing helps them think out and design future activity. It is easy to use since an online assistant guides the development of the project step by step through a precise set of questions. Examples of real BMs are also available. The application allows instantaneous collaborative writing among the entrepreneurial team members. Data is confidential but the narrative representation of the BM can be shared with collaborators (such as teachers, experts, other students enrolled in the seminar) who are invited to comment on the project. The design is flat, modern and ergonomic, and inspired by web games. The application is totally free and is accessible to any teacher who wishes to use it. The GRP Storyteller is the application we tested in this research. Figure 2 explains about GRP Storyteller.

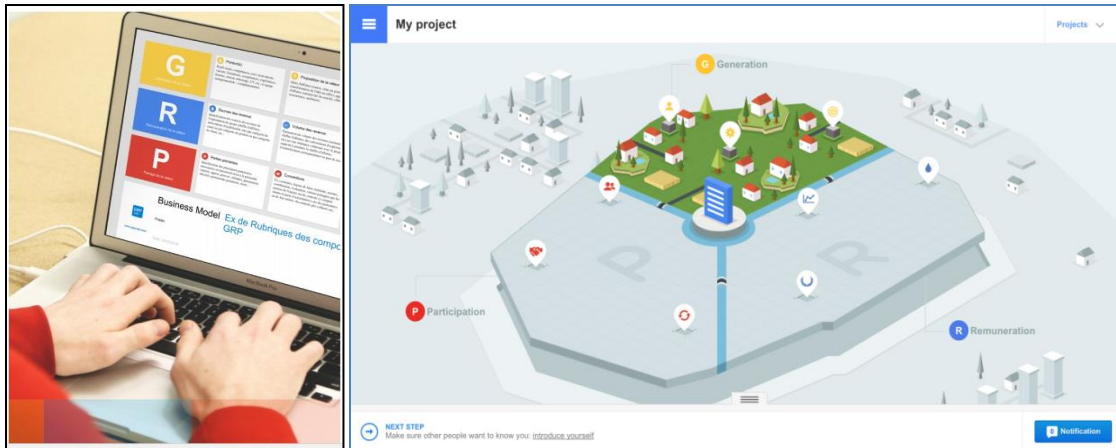


Figure 2
GRP STORYTELLER

RESEARCH DESIGN AND METHOD

We choose to focus on an introduction to entrepreneurship courses centered on the BM rather than on the business plan, in higher education and for non-business students (following Leschke, 2013). The seminars are mandatory and include lectures about BM techniques and more specifically about the GRP model, specifying its nature, components and functions. During these seminars, students are expected to participate in groups of 4 to 7 in a role-play. Acting as entrepreneurial teams, they have to design a BM on their own which is then presented to potential stakeholders, played by teachers. Students are expected to use the web application to transform their first ideas into convincing BMs. Based on telling the story of one's business (Magretta, 2002; Martens et al., 2007), the web application generates a final document of a few pages that helps the students convince the stakeholders during an oral presentation. In this specific pedagogical context, we first define our learning objectives and the specific criteria to evaluate the web-learning application technically. We then describe the survey. Finally, we present our sampling and data collection.

Definition of the Learning Objectives

Bloom's taxonomy revised by Krathwohl (2002) gives an interesting perspective on specifying and measuring pedagogical objectives. The authors define it as a framework "for classifying statements of what [teachers] expect or intend students to learn as a result of instruction" (p.212). In its revised version by Krathwohl, it provides teachers with a measurement tool that serves as a common basis for harmonizing educational objectives among people, levels, programs and topics. Thanks to the taxonomy, teachers can precisely define and evaluate what they expect from a teaching content. The revised taxonomy appears as a two-dimensional table named the Taxonomy Table (Krathwohl, 2002). The vertical axis refers to the knowledge dimension. It contains 4 categories: 1/ factual (the basic elements students must know), 2/ conceptual knowledge (interrelationships between the basic elements in larger structures such as classifications, models, theories, and generalizations), 3/ procedural knowledge (that refers to how to do something through methods and skills) and 4/ metacognitive

knowledge (including the awareness of one's cognition and knowledge). The horizontal axis refers to the cognitive process dimension. It is declined in six verbs hierarchized according to their complexity, each of them being a different educational objective: remember, understand, apply, analyze, evaluate and create.

The position of the web application GRP Storyteller is presented in Table 1. As the core of the application is a model, we deal with conceptual knowledge. The GRP model is indeed a system in which the interrelations between the components are as important as the components themselves. All six objectives could potentially be considered in any entrepreneurship course teaching the BM. Nevertheless, insofar as the seminar is an introduction to entrepreneurship, we choose to restrict our objectives to three: remembering the GRP BM, understanding the GRP BM and applying the GRP BM.

Table 1						
PLACEMENT IN THE TAXONOMY TABLE OF THE GRP STORYTELLER WEB APPLICATION FOR NON-BUSINESS STUDENTS ENROLLED IN INTRODUCTION TO ENTREPRENEURSHIP COURSES						
	Cognitive Process Dimension					
Knowledge dimension	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual knowledge						
Conceptual knowledge	X	X	X			
Procedural knowledge						
Metacognitive knowledge						

Specific Criteria for Studying the Quality of a Learning Web Application

As with any web service, a web application should be evaluated according to objective and standardized criteria. Reviewing the evaluation criteria methods used in e-business services in a meta-analysis, Hasan and Abuelrub (2011) identified general criteria that can help web designers create or evaluate websites regardless of the type of service offered. These criteria are split into four dimensions: content quality (accuracy, relevance, etc.), design quality (attractive, appropriateness, color, image, sound, video, and text), organization quality (index, mapping, links, etc.) and user-friendliness quality (usability, reliability, interactive features, security/privacy and customization).

In the specific case of web-learning systems, the evaluation should also include learning and instructional theories (Hsu, Yeh and Yen, 2009). As pointed out by Chandra and Theng (2009), an efficient e-learning system should not only be user-centric, i.e. designed to exploit "the capabilities of technology to address users' needs, preferences and abilities" in order to achieve greater convenience. It must also be "learner-centric" so that learners are motivated to learn and reach their learning objectives thanks to a facilitating tool. Hsu, Yeh and Yen (2009) propose objective design criteria for web-based learning platforms and develop an evaluation scale for web-based learning platforms in which four dimensions and their respective indicators should be taken into account. These dimensions include instructional strategy, teaching material (accuracy, topic clarity, appropriateness, etc.), learning tool (usability, navigation design, etc.) and learning interface (text, image, animation, video, etc.).

Design of a Specific Survey

To assess the utility of the GRP Storyteller web application in learning and teaching the BM, we designed a survey presented in Table 2. The quantitative study is structured in two parts with four-point Likert scale questions (from “I do not agree at all” to “I totally agree”). The first part tests the learning content of the application. We included the pedagogical objectives previously defined, thanks to Bloom’s taxonomy. We also added specific objectives related to the application itself and the nature of the seminar in which the students were required to use it. Indeed, the application was created to help entrepreneurs design a BM. By writing their BM, learners organize their thinking. The writing is guided by an online assistant. For each component of the GRP model, the assistant gives explanations and recalls what is expected, providing learners with theoretical content, questions to get them started and examples. Our aim is thus to check if the application is helpful in writing a BM and how the assistant contributes to achieving this objective. This is consistent with the content quality dimension of Hasan and Abuelrub (2011) and the teaching material dimension of Hsu, Yeh and Yen’s (2009) scale. Since the main goal of the seminar consists in presenting a BM, we also test the utility of the application in visualizing a BM, communicating a BM and being convincing.

The second part of the quantitative study addresses the general criteria of the application regardless of the learning content that it offers. As stated in the analytical framework, beyond its pedagogical goals and learning content, the quality of a web application also depends on using criteria that we split into three dimensions. Design, organization and user-friendliness follow Hasan and Abuelrub’s (2011) comprehensive framework. We adapted the user-friendly dimension by adding items specific to the GRP Storyteller functionalities. These include collaborative characteristics, text-editing, introduction of image and tables and exporting the final document as a PDF file. This survey is supplemented by a qualitative study of overall satisfaction with the web-learning application. Two open-ended questions are asked about the strengths and weaknesses of the application perceived by the users. Our goal is to identify which characteristics are spontaneously pointed out by the application’s users.

Dimension	Category	Number of Items
Satisfaction	Overall satisfaction	1 item
	Strengths	Open question (qualitative study)
	Weaknesses	Open question (qualitative study)
	Utility	4 items and 6 open questions
Pedagogical Objectives and Content / Teaching material	Bloom and Krathwohl’s pedagogical objectives	Remembering
		Understanding
		Applying
	Other specific objectives	Writing
		Visualizing
		Communicating
		Convincing
Quality of the assistant	6 items and 1 open question	

Design	Attractive	1 item
	Appropriateness	3 items
	Color	1 item
	Image	2 items
	Text	3 items
Organization	Structure	1 item
	Navigation bar	4 items
	Links	1 item
User-friendliness	Usability	3 items
	Reliability	1 item
	Interactive features	1 item
	Security/privacy	2 items
	Customization	1 item
GRP Storyteller specific functions	Collaborative	1 item
	Text entry/ Text editing	2 items
	Image/Table	1 item
	Exporting as PDF	1 item

Sampling, Data Collection and Analysis

Quantitative and qualitative data was collected online from 281 non-business students enrolled in compulsory seminars introducing entrepreneurship. Such programs avoid any selection bias owing to elective participation in programs. Students' responses were collected from two separate groups but the seminars were identical and repeated by the same teachers. Both of them concerned engineering students. The participants in the first group were 3rd-year graduate biology engineering students in Bordeaux, France (124 respondents). The participants in the second group were 1st-year undergraduate mechanics engineering students in Bordeaux (157 respondents). Data was collected in February 2015. The whole sample group comprised 41% women and 59 % men. The average age was 21.8 years old. All questionnaires were returned on the day the students made their oral presentation. The questionnaires were anonymously self-administered online on Google Drive. There were no missing answers since all the questions were mandatory. The final sample consisted of 281 valid questionnaires. The quantitative data was analyzed with Excel and SPSS.

RESULTS

The quantitative study largely shows a positive appreciation of the web application. Students are satisfied with the application and a large majority of them think it is useful (Table 3).

Table 3		
GENERAL APPRECIATION OF WEB APPLICATION (n=280, min=1, max=4)		
Item Description	Mean	SD
I am globally satisfied with the GRP Storyteller web application.	3.263	0.670
To me, the GRP Storyteller web application is useful.	3.437	0.651

Most students agree that the learning objectives are reached: the application is mainly perceived as useful for remembering, understanding and applying the GRP BM (Table 4).

Table 4
LEARNING OBJECTIVES AND TEACHING MATERIAL (N =280)

Item Description	Mean	SD
GRP Storyteller helps me remember the GRP model	3.188	0.718
GRP Storyteller helps me understand the GRP model	3.323	0.630
GRP Storyteller helps me apply the GRP model.	3.437	0.640
GRP Storyteller helps me write a business model.	3.555	0.606
GRP Storyteller helps me visualize a business model.	3.441	0.662
GRP Storyteller helps me communicate my business model.	3.135	0.770
GRP Storyteller helps me be more convincing when I present my business model.	2.861	0.830
I systematically use GRP Storyteller assistant.	3.281	0.878
GRP Storyteller assistant is well-structured.	3.330	0.696
GRP Storyteller assistant is clear.	3.238	0.775
GRP Storyteller assistant is related to the course content.	3.049	0.842
GRP Storyteller assistant is accurate.	3.309	0.701
GRP Storyteller assistant is exhaustive.	3.153	0.765

The highest means correspond to the “helps me write” and “helps me write the GRP business model” items. Yet, the GRP Storyteller appears less useful to help students be convincing in front of potential stakeholders. The GRP Storyteller assistant is particularly well evaluated by the students on all the items, with the structure and accuracy items receiving the highest scores. These results are consistent with the qualitative comments. Of 281 participating students, 159 spontaneously mentioned the online assistant as the main strength of the application:

“The assistant is convenient and easy to read. The help and appendix in each part of the model are useful and useful and interesting”.

The help in structuring the BM writing is also appreciated:

“The step-by-step written presentation of the project helps visualize and describe all its dimensions”; “The model is well defined and structured”.

Twenty-two students suggest adding more examples:

“The examples given are not representative enough”.

Design and organization are presented together in Table 5.

Table 5
DESIGN AND ORGANIZATION

Item Description	Mean	SD
GRP Storyteller has an aesthetic effect.	3.445	0.670
The design of the application (images, text, graphics and animation) is appropriate.	3.249	0.809
The general layout of each page is consistent through the web application.	3.388	0.619
The graphic components are consistent through the web application.	3.327	0.674
Background and text colors are appropriate.	3.377	0.653
The icons chosen for the components are appropriate.	3.405	0.624
The dashboard (as a building platform) is appropriate.	3.555	0.601
The text of the assistant is readable (font, paragraph).	3.192	0.763

The text of the application (except the assistant) is readable.	3.362	0.639
The final document (PDF file) has an attractive layout.	3.135	0.793
The structure of GRP Storyteller is clear.	3.451	0.601
The structure of GRP Storyteller facilitates navigation.	3.327	0.720
The navigation menu is adequate.	3.412	0.675
The navigation menu is easy to find.	3.423	0.633
The dashboard facilitates navigation.	3.483	0.670
Links inside the application work properly.	3.288	0.700

The design and organization dimensions of the application are closely linked since the dashboard that structures the organization of the application is also emblematic of its original design. Results show that the design of GRP Storyteller meets the users' needs and preferences. Students mainly outline that GRP Storyteller has an aesthetic effect. In the qualitative study, the students say:

"I really liked the idea of the little houses and buildings under construction"; "the fun aspect is really motivating"; "a nice dashboard"; "modern esthetic and clear"; "well-designed, beautiful and flowing".

They approve the chosen icons, background and text colors and the general layout. Remarkably, the dashboard is perceived as facilitating and appropriate, obtaining the highest score in our survey with a mean of 3.55 ("the dashboard is original for seeing the progression of the project"). The navigation bar and the final document layout are also largely appreciated by the students.

The last dimension we tested is the user-friendliness of the application (Table 6).

Table 6 USER-FRIENDLINESS/SPECIFIC FUNCTIONS		
Item Description	Mean	SD
GRP Storyteller is easy to navigate.	3.459	0.630
Information is easy to find.	3.256	0.684
GRP Storyteller works properly (time downloading, availability).	2.975	0.902
GRP Storyteller has clear instructions for using its different parts.	3.067	0.700
GRP Storyteller lets me invite authorized users.	3.170	0.804
GRP Storyteller keeps my information secure.	3.046	0.764
GRP Storyteller is adapted to my needs.	3.398	0.629
GRP Storyteller facilitates interaction between authorized users.	3.469	0.715
I can easily enter text in GRP Storyteller.	3.302	0.875
I can easily edit text and choose the layout in GRP Storyteller.	2.309	1.043
I can easily insert images or tables in GRP Storyteller.	2.423	1.030
It is easy to export the final document.	3.380	0.696

As opposed to the other dimensions, the results show contrasting evaluations depending on the items. On the one hand, GRP Storyteller is perceived as performing significantly well on some criteria. The highest scores concerns easy navigation, easy-to-export PDFs and collaborative work. This confirms some of the strengths that were spontaneously underlined by the students in the qualitative study (180 out of 281 students declared that the application was "easy to use"). On the other hand, text editing and the insertion of images and tables are poorly evaluated. They receive the lowest scores, thus clearly identifying a weakness that is confirmed in the qualitative study:

"The insertion and dimensioning of figures should be easier"; "the layout should be improved".

DISCUSSION

Our purpose was to test the perception of whether and to what extent the dedicated web application GRP Storyteller is useful in teaching the concept of a BM. The results show that, from a pedagogical standpoint, it is relevant for teaching the BM concept. The students' survey shows that it helps them remember, understand and apply a conceptual model. In the qualitative study, the students spontaneously referred to the clarity of the structure of the BM in three dimensions, which indicates that, its theoretical background, and in particular its building blocks, were understood. The application even suits non-business students. Our results thus match Leschke's (2013) conclusions in that the BM is useful for introducing entrepreneurship to non-business students.

The experiment also sheds some light on how the application is useful. On the whole, GRP Storyteller was recognized by students as a high-quality web application, as defined by Hsu et al. (2009). There was agreement between how we wanted to position the application when we created it (useful for teaching and learning the BM, collaborative, easy-to-use, with an attractive design and accurate teaching material) and how the students perceived it.

According to Bloom's taxonomy (revised by Krathwohl, 2002), the scores concerning how the application is understood and can be applied are consistent with our expectations. Although the score for remembering was also quite high compared to others, we believe it could be improved, in particular because it is the first learning objective. However, the answers were subjective and depended on the students' perceptions. Memorization should be further tested through objective evaluation criteria, such as a quiz for instance, in order to better appreciate the extent to which students memorize the conceptual knowledge that is central to the seminar.

The BM has been shown to play an important role in convincing potential stakeholders (Linder and Cantrell, 2001; Magretta, 2002; Martens et al., 2007; Verstraete and Jouison-Laffitte, 2011a). Students perceive that the narrative version of the BM produced through GRP Storyteller does not train them enough for their oral presentations. On this particular aspect, the application could be improved. In addition to the narrative file (PDF), another document such as a Prezi or the empty template of a PowerPoint could help them prepare their oral presentations more efficiently.

According to Hsu et al. (2009), teaching material is one of four significant dimensions for evaluating web-based learning platforms. The online assistant is a specific strength of the application. Only one item related to this assistant did not match our expectations. Although the assistant was designed to be as complete as possible, at least from a theoretical standpoint, students did not rate the completeness item as well as we expected. This relatively disappointing result is consistent with what we observed in the qualitative study: in addition to the theoretical teaching material that they judged accurate and helpful, students asked for more practical examples relating specifically to their own contexts.

One of the results exceeded our expectations. Although the application was not designed to be a serious game, students appreciated its game-like features. They particularly liked the interactive dashboard, finding it "motivating" as a small virtual world gradually grows as the job progresses. This is consistent with the trend of "learning with fun" that Chandra and Theng (2009) evoke, explaining that it is important to mix learning with games since the motivation levels of games can improve learning outcomes. This is even more crucial for e-learning systems that rely neither on student-instructor interaction nor on a stimulating classroom environment.

Following on from Chandra and Theng (2009), we could go further by integrating the evaluation of the game-like features of the web learning application into future research.

As a consequence, this research has given us guidelines for improving the tool and its pedagogical use. From the pedagogical standpoint, the online assistant has been enriched with more examples and other teaching material like videos and tutorials. The evaluation will include a quiz to test how students memorize the GRP Model. Technically speaking, the word processor has been improved (better integration of images and tables, more visually attractive layout). Therefore, from an analytical point of view, our research echoes Greene and Rice's (2007) and Fayolle's (2008) call for deeper insight into the content, the methods and the evaluation of entrepreneurship education programs. Indeed, questioning the effectiveness of a new method for introducing entrepreneurship is directly related to "what" we teach (the BM), "how" we teach (a specific web application fostering collaborative work) and "for what" we teach (definition of learning objectives and criteria of effectiveness).

CONCLUSION: IMPLICATIONS AND RESEARCH PERSPECTIVES

Our findings have practical implications for educational institutions aiming at teaching entrepreneurship and for entrepreneurs aiming at designing BMs. We found that a specific dedicated web application is useful for learning and teaching the BM concept. However, the context of our research is limited to courses introducing entrepreneurship to non-business students. How can the application's relevance be tested in other pedagogical contexts? To answer this question, further research is needed. From this perspective, our team has already started working with different groups. For example, we use the GRP Storyteller with business students and in particular with "students-entrepreneurs" who want to create real businesses. These students are engaged in a learning-by-doing pedagogy that echoes the action-based entrepreneurship education described by Rasmussen and Sorheim (2006). We have also introduced entrepreneurship into high-school programs using the GRP Model. Another interesting perspective would be to consider how the application might be included in methods used in business incubators.

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