



Project-Based Learning in Mini-Companies. Student Perceptions of "Young Enterprise Switzerland"

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Abstract: This paper analyzes how involved students retrospectively evaluate the participation in mini-companies in Swiss higher secondary schools. These mini-companies are entrepreneurial projects situated in the field of business education, which require real investments and active marketing measures on a small scale. The cross-sectional study is based on a survey concerning the Company Program of "Young Enterprise Switzerland" (YES). The theoretical framework has been derived from a discussion of different pedagogical concepts of project learning. The analysis is guided by a structural equation modelling approach. Overall, the data show a high level of expected benefits. These expectations correspond with a positive assessment of cooperative efforts during the project and with positive views concerning the social function of entrepreneurship for the public weal.

Keywords: entrepreneurship education, mini-companies, economic competence, business skills, project learning

The idea of project learning is based on the assumption that self-regulated activity is an important stimulus for the successful acquisition of skills and competencies. In the field of entrepreneurship education, this paradigm suggests that rather than teaching *about* entrepreneurship or designing lessons *for* entrepreneurship, it is necessary to provide opportunities to learn *through* entrepreneurship (Johanson, Schanke & Clausen 2012; Kirby 2007). According to this supposition, mini-companies should be implemented in schools and universities in order to provide possibilities for experimental start-up activities. In these programs, teachers should act as facilitators whose actions are based on a principle of pedagogical self-restraint: in order to foster the development and realization of business ideas, teachers should carefully avoid prescriptions and preliminary decisions from above. To a large extent, students should be free to define their ventures collaboratively, to organize themselves in teams, to invest small amounts of money, to provide services or to fabricate goods, and to some extent, they should experience the consequences of entrepreneurial risk-taking.

This paper presents the results of a study on student perceptions of learning outcomes induced by entrepreneurial activities in mini-companies. We use cross-sectional data of Swiss students at the higher secondary level which participated in the *Company Programme of Young Enterprise Switzerland* (YES) in the school year 2011/12. The scope of our study is marked by four key themes and corresponding questions:

- Experience: How do students evaluate the development of their mini-companies in retrospect?
- Social construction of entrepreneurship: How are the judgments about the projects linked to general perceptions concerning entrepreneurial activities?
- Competence development: How do students assess the acquisition of knowledge and skills resulting from their entrepreneurial activities?
- Biographical perspectives: How are future plans shaped by the project-related entrepreneurial experiences?

The paper is composed of seven sections. The first section lays out the concept of project-based learning, while the second discusses concepts of entrepreneurship. Section three presents the main features of *Young Enterprise Switzerland*, followed by a section focusing on empirical findings concerning the participation of students in mini-companies. The fifth section presents our hypotheses, the research design and the findings. The last section includes the discussion of the results, followed by a brief conclusion.

1. Project-based learning

Strongly influenced by the philosophy of progressive education (Dewey 1897; Kilpatrick 1929), the project method is premised on the idea that learning processes are more efficient the more they comply with the principle of self-regulation. Self-regulated activities are supposed to be more productive than externally controlled activities for three reasons: first, because the freedom to choose objects, instruments or strategies enhances the motivation; second, because time and other resources will be used more effectively when students realize that they have a say in their learning processes; and third, because the sustainability of the outcomes will be higher when students are able to adjust their learning strategies in a process of self-monitoring (Baumert et al. 2000; Deci & Ryan 1985; Schunk & Pajares 2002; Weinert, 2001; Zimmerman 1989).

Sometimes oversimplified as "learning by doing", neither Kilpatrick nor Dewey promoted project-based learning as a form of activism which will lead automatically to substantial cognitive progress. Educational projects have to be based on pedagogical reflection, and they need guidance that should occur indirectly by setting boundaries. Thus, Dewey stressed the point that it is not a task of the teacher "to impose certain ideas or to form certain habits in the child", but to shape the

learning environment by selecting influences and by assisting the students "in properly responding to these" (Dewey 1897: 9).

Kilpatrick conceived educational projects as forms of "wholehearted purposeful activity in a social situation", and maintained that these activities must be "the typical unit of school procedure" (Kilpatrick 1929: 18). From this point of view, the school must center on student-driven activities because "the purposeful act is [...] the typical unit of the worthy life in a democratic society" (Kilpatrick 1929: 6).

The vision of Kilpatrick stresses the importance of problem-solving activities directed to practical solutions. In other words, the leading questions of the projects should favor answers that matter for real life. The students should experience the problems as authentic, and they should be truly interested to overcome the challenge (Holm 2011; Markham 2011; Thomas 2000). Difficulties are an ingredient of learning, but the students should recognize the difficulties as self-defined tasks. Sometimes teachers may intervene in order to protect students, but generally the school should be a field of self-directed exploration. However, this vision may result in underestimating the artificial character of schooling and in overestimating the intrinsic motivation of students. In both regards, the approach of Dewey is suitable to avoid unsubstantiated optimism.

While Kilpatrick promoted the project method as a blueprint for the re-definition of the curriculum and the syllabus as well as the composition of learning groups, Dewey was inclined to take it as a guiding principle for the organization of learning arrangements inside or outside the classroom. From this point of view, these arrangements could include teacher-centered activities when this choice is based on pedagogical arguments. In this sense, student-driven activities are essential for educational progress, but they depend on pedagogical inputs, interventions and feedback that are elements of an institutional and thus unnatural learning environment (Dewey 1938: 2). Teachers, principals and political stakeholders define the educational setting, and through setting such parameters, create a curricular framework of artificial challenges.

Thus, Dewey avoided equating self-regulated learning with project-based learning: teachers can provide opportunities of self-regulated activities in the context of traditional classroom settings (cf. Barron & Darling-Hammond 2008). Moreover, while Kilpatrick focused on curiosity and affection as internal impulses for learning, Dewey avoided equating self-regulated learning with intrinsically motivated learning. Thus, it is improbable that every difficult question can be presented in a way that the problem will be adopted as a self-defined task by students. The choice of pedagogical influences can sometimes include unpleasant assignments, since carefully selected impositions and vexations provide an opportunity to develop self-discipline and other attitudes that are important to deal with a complex and sometimes unpredictable environment. Consequently, the extent by which the agenda of projects is shaped by the inquisitiveness of students may vary. In any case, the task of the teacher cannot be limited to the removal of obstacles since that would only result in the illusion of self-control (Dewey 1938: 75).

Moreover, the approach of Dewey takes not only the possibility of extrinsically motivated project-based learning into account, but also the possibility that educational projects are sometimes embarked upon when the motivation of learners is diffuse or even marked by reluctance. In these cases, the key to positive long-term development lies in small achievements that enable a feeling of success. This line of thought has been evolved further in the social learning theory of Bandura, stressing the connection of the cognitive, emotional and motivational dynamics. According to this model, the success of initial, still diffusely motivated experimental approaches to a problem substantiates the experience of self-efficacy, which in turn triggers and strengthens intentional learning processes (Bandura 1994; Boekaerts 1996). In this learning cycle, both curiosity and enthusiasm can play an important part. However, extrinsic motivation may also lead to the successful accomplishment of projects. Self-regulated activities can be instigated by stimuli that are not related to the object itself (Butler & Winne 1995; Deci, Koestner & Ryan 1999; Pintrich 2003; Wigfield & Eccles 2002). Project-based learning is possible both when individuals experience the

acquisition of skills directly as an achievement of their objectives and when they perceive the achievement as instrumental with respect to their status and their future prospects.

A national evaluation of grammar school projects in Switzerland that belong to the core elective curriculum shows that more than three-fourths of the students are convinced that these projects, in which they work alone or in small groups for several month on a disciplinary or interdisciplinary topic, have been beneficial for their personal development. Furthermore, 57% state that the projects have been somewhat or very useful for college readiness (Quesel & Husfeldt 2013). With regard to learning achievements, the data reveal that the acquisition of organizational competencies is regarded as more important than the acquisition of domain-specific knowledge. However, most students also confirm that the workload of the projects is considerably higher in comparison to regular instruction.

2. Concepts of entrepreneurship

In his inquiry on the "Wealth of Nations" (1776), Adam Smith introduced the concept of the "invisible hand" (Smith 1776: 456), thus suggesting that individual economic behavior based on rational self-interest will lead to common welfare if the conditions of free market exchange are satisfied (Smith 1776: 26f). Smith gives attention to industry, commerce and capital, yet he does not refer explicitly to entrepreneurship. Jean-Baptiste Say, an admirer of Smith, has since created a definition of entrepreneurship, in which entrepreneurs have to combine a sense for risks and opportunities with highly developed organization skills in order to make profits (Say 1803: 375). Stressing the point that many will fail as entrepreneurs while only a minority of competent individuals will be able to overcome the obstacles on the way to success, Say is bordering on an evolutionary approach to economic development: better solutions will prevail by shifting resources from strategies of lower yield to strategies of greater yield (cf. Drucker 1985: 28). Since these shifts

toward higher productivity imply the obliteration of established industrial and commercial patterns, the process of entrepreneurial innovation can be regarded as "creative destruction" (Schumpeter 1944: 81-85).

The process of creative destruction may also involve the organizational structures of firms: with regard to the corporate management style which dominated the 20th century, it has been argued that large firms should foster innovation through "intrapreneurship", implementing structures of decentralized responsibility and autonomous risk-taking on the level of sub-units (Pinchot 1985). Some authors argue that the age of information technology and automation opens up new possibilities to leave the corporate management style behind, thus leading to an "entrepreneurial society" shaped by myriads of new ventures (Audretsch 2007; Gavron, Cowling, Holtham & Westall 1998). A guidebook for the creation of start-ups declares that the "entrepreneur revolution" will mark the end of the industrial age, which has been dominated by large companies and mass production (Priestley 2013).

The idea that entrepreneurship is the hallmark of a new age is supported by different transnational collective actors: the European Commission urges that entrepreneurship must be recognized as a new basic skill that should be imparted to all children and youths. According to this point of view, the entrepreneurial "mindset" must permeate the whole European Community in order to secure the status of a global player (European Commission 2003: 5; 2006a: 6; 2006b: 1). The EU reference framework for key competencies declares that the ability to turn ideas into action is the most important indicator of entrepreneurship, including "creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives" (European Commission 2006c: 4). In a similar vein, the OECD stresses the point that economic progress requires a mindset which is marked by the entrepreneurial abilities "to think creatively, to motivate teams, to manage risk and handle uncertainty" (OECD 2009: 13). The World Economic Forum (WEF) argues that welfare is linked to ownership and that widespread and sustainable ownership depends on the proliferation of entrepreneurial attitudes and the

development of an "entrepreneurial ecosystem" (WEF 2009: 10). Following this line of thought, the social function of entrepreneurship should be re-defined from being a special economic status of a small minority in the past, to a general requirement for success today.

The beneficial features of entrepreneurship are underlined by a common report from UNESCO and the International Labor Organization (ILO), which states that "entrepreneurs are essentially ideas people, who seize an opportunity to generate value or well-being in society" (UNESCO & ILO 2006: 5). The records of a debate on entrepreneurship at the United Nations in

June 2013 include a general statement summarizing one recurring thought in the speeches of Ban Ki-Moon, Shimon Peres and other politicians and diplomats as follows: "all entrepreneurs share the same spirit of driven, committed, talented and highly motivated individuals who continue to advance innovation, finding creative economic and social solutions, and contributing to the wealth and health of their communities" (UNO 2013: 2; cf. UNCDAT 2012: 1).

Thus, these transnational pleas border on messianism: the entrepreneurs shall save the world. The question of whether entrepreneurial behavior may imply problematic traits or negative consequences seems irrelevant. Four critical points should be taken into account in order to avoid idolatry:

- a. *Entrepreneurship as muddling through:* About eight out of ten new ventures declare bankruptcy in the first two years. Most ventures are not based on an innovative idea, but imitate existing enterprises. In many cases, the entrepreneurial activity is limited to self-employment, and is a stopgap solution with regard to impending unemployment. A failing second or third attempt often follows the first failing venture, and the case of successful learning from failure is rather exceptional. Even most successful entrepreneurs are not glamorous individuals with great visions for the future, but rather common people trying to cope with the difficulties of ordinary life (Shane 2008).

- b. *The commercialization of life:* The fact that the exploitation of opportunities is for many entrepreneurs limited to self-exploitation leads to criticism that the plea for universal entrepreneurialism is the expression of an economic development that has eroded social communities. This erosion has left people in a state of permanent insecurity, dominated by the impression that life is a "rat race". Thus, Richard Sennett argues that technological and commercial changes are leading to unstable entrepreneurial settings that add to the "corrosion of character" (Sennett 1998: 31, 87, 147). In a similar sense, it has been contended that when business projects are stylized as a form of creative expression bordering on the making of artworks, it is nothing more than a desperate reaction to the disenchantment of the world of entrepreneurship (Boltanski & Chiapello 2007).
- c. *The limits of honesty:* Entrepreneurship is not ethical per se, as the exploitation of opportunities includes the possibility of transactions which are detrimental for the opposite side. The abuse of bargaining power with regard to natural resources and environmental damage or with regard to wages and working conditions can be profitable. Experiments have shown that monetary incentives may indeed have corrupting effects (Kouchaki, Smith-Crowe, Brief & Sousa 2013) and that the tendency to bend rules and to shirk responsibilities is high when the frame of mind is focused on commercial success (Cohn, Fehr & Maréchal 2014). It should be pointed out that, on one hand, these findings are not only relevant for entrepreneurial behavior, while on the other hand, experiments show that a person engaging in everyday life normally does not act in a radical egoistic manner. Yet the contention that entrepreneurship is ethical in and of itself can certainly not be corroborated by empirical findings. Vices can perhaps be turned into profit (Mandeville 1732), but that does not turn them into virtues, even when the activities lead to economic growth.
- d. *The individualization of failure:* The over-estimation of opportunities for entrepreneurial success can lead to the self-attribution of failures that may in fact be ultimately rooted in social disparities (Broeckling 2007). The rhetoric of

entrepreneurial revolution and *entrepreneurial society* can blur the fact that even highly developed countries are afflicted by poverty and marginalization that undermine the formal equality of opportunities. Hence, the entrepreneurial mindset could reinforce the meritocratic illusion that success appears as a personal achievement while it is in fact the result of privileged social conditions (Bourdieu & Passeron 1990). Although it should be stressed that despite transnational collective actors demanding more and better entrepreneurship education as a coping strategy to overcome social disparities, the problem remains that learning and training is not sufficient to fill the cracks and crevices of social structures.

These remarks are certainly not intended as a final judgment on entrepreneurship, but they clarify that it is misleading to treat the subject in the manner of hero-worshipping. Survey data show that the public opinion on entrepreneurship is multifaceted. Although the European Commission talks specifically about entrepreneurial contributions to economic progress and common welfare, Eurobarometer data reveal that the citizens of the EU appreciate these contributions while also expressing some critical reservations of entrepreneurial motives. Indeed, almost 90% of the respondents perceive entrepreneurs as job creators and almost 80% agree that entrepreneurs are responsible for the growth of welfare in terms of new products and new services. However, 54% of EU citizens support the statement that entrepreneurs only think about their own wallet and 49% agree that entrepreneurs exploit other people's work (European Commission 2010: 24).

A similar mixed picture is revealed in a German youth survey. Here, 75% of the adolescents express a favorable opinion and 12% a highly favourable opinion on entrepreneurship (Hekman 2007: 7), while a large majority also deplore the tendency that entrepreneurs demand "more and more" from employees while trying to pay "less and less" (Hekman 2007: 11). Though many adolescents declare that they are interested in business topics, they are often skeptical about their own

competencies. In the German survey, four out of ten respondents rate their own economic knowledge as somewhat or very weak. However, 57% of the respondents believe that they have the capacity to manage their own business someday (Hekman 2007: 15). Although indispensable, economic knowledge is not a sufficient condition for entrepreneurial success. Using quantitative and qualitative data, the first wave of a longitudinal study on youth entrepreneurship among university students in the United States indicates that self-regulation skills, the orientation towards innovation, and the example of adults are crucial for the development of entrepreneurial intent (Geldhof et. al 2014). A fourth factor, the tolerance of financial risk, is marked by a divergence between quantitative and qualitative data, although the theoretical framework of the study attached this aspect a central importance (Damon 2014; Lerner & Damon 2012). While the quantitative data confirm the expectation, the interviews suggest that risk-taking has, from the students' perspective, only a hypothetical relevance.

In contrast to that, mini-companies are based on the assumption that hypothetical considerations of entrepreneurial risks can be transformed into instructive real-life experiences. With a history dating back to the early 20th century, *Junior Achievement* is an initiative for the implementation of mini-companies in schools with a long tradition and a worldwide impact. The next section presents the features of this initiative and of its Swiss affiliation.

3. Junior Achievement and Young Enterprise Switzerland

The origins of *Junior Achievement* (JA) date back to a philanthropic initiative from 1919, which strived to strengthen thrift, economy and industry as commercial virtues (Hobbs 1926). Designed as an after-school program for high school students, it was focused on the strategy of practical learning, though in the first decades the emphasis was set on employability rather than on entrepreneurship. In the second half of the twentieth century, the focus shifted from the inculcation of work ethic to

the question of how to start and manage a business (Francomano 1988). However, the requirement of self-discipline should not be disregarded: A JA teen survey indicates that 23% of the respondents regard work ethic as the most important trait for entrepreneurial success, only exceeded by the importance of creativity and imagination (regarded by 34% of teen respondents as decisive) (JA 2010: 5).

The foundation of mini-companies is the key element of the *company program* of JA. The European branch of JA specifies the goals of this program as follows: It shall provide adolescents with an "in-depth entrepreneurship experience" through self-directed commercial activities, resulting both in the preparation of a balance sheet at the end of the project and a report on the "key lessons learned" (JA-YE Europe 2012: 16).

As an affiliation of JA-YE Europe, *Young Enterprise Switzerland* (YES) is the result of a merger of two forerunners in 2006. In Switzerland in the area of full-time schooling, YES is the most widely implemented mini-company model. In the academic year 2011/12, approximately 100 teams of students at the upper secondary education level applied this model, with a total of about 750 students participating across all regions of Switzerland. The general decision to participate is made by teachers and principals, and the projects are included as part of the curriculum for the commercial track. Thus, students know that participation is mandatory when choosing this track. In some cases, the students can opt for other business-related projects.

Within the scope of the implementation of the YES program, students establish a mini-company with the aim of developing, implementing and marketing either a product or a service. The project groups consist of about five to ten members who each take on a specific role either as *Chief Executive Officer*, *Chief Marketing Officer*, *Chief Financial Officer* or another management function. The teams organize themselves in order to realize their business ideas over the course of an academic year. They write a business plan, set up the business and submit the financial statement at the end of the cycle. Over the course of the project, they participate in

workshops, seminars and trade fairs organized by YES. In this context they compete with other mini-companies, first on the regional level, and if successful, on the national level. The winners on the national level compete in events on the international level. During the project phase, the groups operate as autonomously as possible. They are mentored by their teachers and supported by former participants in the program and by honorary business consultants.

4. Mini-companies as a form of learning – empirical findings

Analyzing best procedures of entrepreneurship education on behalf of the European Commission, an expert group study on mini-companies in secondary education states that successful frameworks focus on working skills and cooperation, are marked by the continuous availability of professional mentoring and yet leave the students the "freedom to develop their own ideas" and hold them "fully responsible" for the management of the mini-companies (European Commission 2006: 16).

Several studies by various researchers show that participation in mini-companies contributes to the strengthening of self-confidence and to the clarification of career interests (Athayde 2012; Athayde & Hart 2000; Lewis 2005; Lewis & Massey 2003). Social background (Heilbrunn & Almor 2014) and gender (Bergman, Erez, Rosenblatt & De Haan 2011) seem to have strong moderating effects on the perceptions of opportunities and the shaping of preferences: female students and students growing up in deprived conditions show significantly more distance to entrepreneurship.

Relying on data from Norway, Johansen (2012) finds no evidence that participation in the company program leads to a higher level of academic achievement: entrepreneurial education is neither beneficial nor detrimental when it comes to grades as a measure of academic performance. On this account, Johansen stresses the point that entrepreneurship does not only include business knowledge but also components like creativity and risk-taking, which cannot be sufficiently represented

by grades. Johansen (2010) and Johansen, Schanke & Clausen (2012) present evidence that the participation in the company program of JA-YE Europe has a positive impact on the entrepreneurial attitude of students and promotes entrepreneurial activities in later years, especially when the participation in the program is not compulsory. However, Josten & van Elkan (2010) find little evidence that the participation in mini-companies invigorates the founding of enterprises in later years. Furthermore, Oosterbeek, van Praag & Ijsselstein (2010) provide relativizing findings for post-secondary education. In their quantitative longitudinal study on mini companies, which have been established within the context of JA-YE Europe in the Netherlands, the authors show that entrepreneurial motivation and self-confidence have been extenuated over the course of the project and explain this surprising outcome as a consequence of disillusionment: many participants may have learned by practical experience that their talents do not match with the profile of entrepreneurship. To put things into perspective, the authors point out that the motivation of the respondents might have been negatively affected in the Dutch case by the fact that participation in the program had been compulsory for the students.

5. Empirical Study

Our study on YES 2012 is based on an online questionnaire that was sent to all participating students at the end of the program. The draft of the questionnaire was discussed with members of the management of YES and commented on by alumni of YES. Questions concerning general aspects of project learning were adapted from the national evaluation of grammar school projects (Quesel & Husfeldt 2013). With regard to questions concerning views on entrepreneurship and business, we took advantage of the German Youth Survey on Entrepreneurship (Hekman 2007) and the Eurobarometer Survey on entrepreneurship (European Commission 2010).

The scope of our questionnaire embraces five aspects:

- a) The foundation and the success of the mini-company, including the experienced degree of autonomy and cooperation within the mini-company;
- b) Support and mentoring by teachers, alumni and honorary business consultants;
- c) Views on entrepreneurship and entrepreneurial intent;
- d) Perceived outcomes of self-management skills, bargaining skills and organization skills as well as individual prospects with regard to academic studies, vocational training, jobs and career; and
- e) Socio-demographic variables.

Hypotheses

On the background of the foregoing discussion of entrepreneurship and with regard to the findings of the national evaluation of grammar school projects in Switzerland (Quesel & Husfeldt 2013), we expect that the answering patterns of students that have participated in YES 2012 will confirm the following hypotheses:

H1: Cooperation has a positive direct influence on perceived self-competence, management skills, bargaining skills, and individual prospects.

H2: The entrepreneurial identity has a positive direct influence on perceived self-competence, management skills, bargaining skills, and individual prospects.

H3: The impact of cooperation and entrepreneurial identity on perceived management skills, bargaining skills, and individual prospects is partly mediated by self-competence.

H4: Critical views of entrepreneurship have a negative impact on perceived individual prospects.

H5: Appreciative views of entrepreneurship have a positive impact on perceived individual prospects.

Data Collection

The population of our study consisted of 607 students. The return of questionnaires led to a sample of 189 cases, since eight cases of the original dataset ($n = 197$ respondents) had to be excluded because of erroneous mailing addresses or because the answer fields remained empty. Thus, the return rate after the cleansing of the dataset is 31.8%, which can be considered as satisfactory.

All participants were aged between 15 to 20 years, with the average age of 17.5 years (SD 1.1 years), and a median age of 18 years. However, four students did not provide information about their age. 101 respondents were male (53.4 %) and 88 female (46.6 %).

Data were gathered between March and May 2012 by an online survey carried into execution using EvaSys 5.0. In order to avoid misuse of the survey, access was restricted through the use of individual transaction numbers. Anonymity was secured by randomly assigning transaction numbers to email-addresses of potential participants. The data analyses were performed using IBM SPSS Statistics 22 and Mplus 6.1 (Muthén & Muthén 2012).

Findings

The confirmatory factor analysis and the structural equation modeling are based on eight scales: self-competence, management skills, bargaining skills, individual prospects, cooperation, entrepreneurial identity, critical view of entrepreneurship, and appreciative view of entrepreneurship. All items are measured using Likert-scales, with a minimum value of 1 and a maximum value of 7, while two types of predefined answers were implemented. Sometimes the statements had to be rated on a scale from "I do not agree at all" to "I totally agree", sometimes on a scale from "very low" to "very high".

Self-competence is measured by variables indicating the capacity to investigate problems thoroughly, to deliver sound judgments, to articulate and pursue clear goals and visions and to take the perspective of others emphatically. The questions were focused on the retrospective self-perception of competence development during the projects.

The questions concerning the development of skills have been put in the same way. Management skills are measured by variables indicating competent administrative behavior as well as responsibility and self-discipline in organizational contexts. Bargaining skills are measured by variables indicating the capacity to calculate risks, to act in a rhetorically convincing way and to negotiate successfully.

The impact of participation with regard to individual prospects is measured by variables referring to personal development, to enlargement of the cognitive horizon, to academic and work skills and to the development of economic interest.

Critical views of entrepreneurship are measured by variables referring to exploitative, egocentric and socially irresponsible features of entrepreneurial behavior. Appreciative views are measured by variables referring to the creation of jobs, economic growth and the increase of national prestige caused by entrepreneurial success. The entrepreneurial identity is measured by statements referring to the entrepreneurial intent of the students and to the retrospective self-assessment of entrepreneurial competences and interest in business questions at the beginning of the project. The cooperation during the project is measured by variables pertaining to efficiency, motivation, inspiration and participation on a team level.

Table 1 shows variables of eight different measurement models and corresponding numbers of valid cases and descriptive statistics.

Table 1: Descriptive Statistics

	Valid Cases	Missing %	Mean	Median	Std. Dev.	Skewness	Cronbach's alpha
Self competence							
judgement	182	3.7	5.2	5	1.1	-0.6	0.80; N =166
empathy	176	6.9	4.8	5	1.3	-0.7	
investigation	184	2.6	5.0	5	1.4	-0.4	
vision	177	6.3	5.0	5	1.2	-0.8	
Management skills							
administration	188	0.5	5.6	6	1.3	-1.0	0.84; N =187
responsibility	188	0.5	5.7	6	1.3	-1.2	
self-discipline	187	1.1	5.3	5	1.3	-0.8	
Bargaining skills							
negotiation	180	4.8	5.3	6	1.3	-0.7	0.81; N =174
risk awareness	181	4.2	4.8	5	1.3	-0.4	
rhetoric	186	1.6	5.4	6	1.3	-0.9	
Cooperation							
efficient	179	5.3	5.2	6	1.6	-1.1	0.83; N =175
motivated	184	2.6	4.9	5	1.7	-0.8	
inspired	184	2.6	5.0	5	1.7	-0.8	
participative	188	0.5	5.8	6	1.5	-1.4	
Entrepreneurial identity							
intent	186	1.6	5.0	5.5	1.9	-0.8	0.75; N =182
prev_comp	185	2.1	4.7	5	1.6	-0.6	
prev_int	189	0.0	5.1	5	1.6	-0.7	
Appreciative view of entrepreneurship							
jobs 186		1.6	5.8	6	1.0	-1.1	0.73; N =176
com_weal	183	3.2	5.4	6	1.3	-1.2	
national_prestige	181	4.2	5.2	5	1.3	-0.8	
Critical view of entrepreneurship							
exploitative	184	2.6	3.4	3	1.6	0.3	0.72; N =168
egocentric	186	1.6	4.4	5	1.5	-0.4	
irresponsible	171	9.5	4.2	4	1.6	-0.1	

Individual prospects

personality	189	0.0	5.4	6	1.7	-1.1	0.89; N =179
horizon	185	2.1	4.6	5	1.8	-0.7	
acad_skills	185	2.1	4.5	5	1.7	-0.6	
work_skills	186	1.6	5.5	6	1.7	-1.3	
ec_interest	186	1.6	4.4	5	1.9	-0.5	

 Number of cases in dataset: 189

The number of missing values ranges between 0 and 9.5%. Except for four variables, all other variables have missing values below the threshold of 5%, commonly stated as the threshold to use for a single imputation. Many items are left skewed, which could indicate a self-selection bias: it can be expected that students opting for economics as a core area are inclined to express positive views on this subject. However, most items show values in skewness below 1 in absolute values. The arithmetic means confirm the indicated tendency towards positive views: most variables have a mean around 5, while the center point of the scale is 4. The standard deviations range between 1.0 and 1.9. The scale *Individual Prospects* includes three items with means around 4.5: the enlargement of the cognitive horizon (M=4.6, SD=1.8), the development of academic skills (M=4.5, SD=1.7) and the development of interest in economic questions (M=4.4, SD=1.9). Rather close to the center point of the scale are two variables of the scale *Critical view of entrepreneurship*: the statement that entrepreneurs are exclusively interested in private profit has a mean of M=4.4 (SD=1.5) and the statement that entrepreneurs show a lack of social responsibility has a mean of M=4.2 (SD=1.6). This scale contains the only variable with a mean lower than the center point of the scale: the statement that entrepreneurs exploit the work of other people has a mean of M=3.4 (SD=1.6), which indicates a moderate tendency to refute the criticism. Thus, the double negation matches the affirmative pattern.

The reliability of the scales is measured by using Cronbach's alpha, which is for most of the scales higher than 0.8, thus indicating a good quality. For three scales,

the alpha ranges above 0.7, indicating a satisfactory quality. These scales are "critical view of entrepreneurship" (0.76), "appreciative view of entrepreneurship" (0.73) and "entrepreneurial identity" (0.75). The number of eligible cases for each calculation is shown in Table 1 next to Cronbach's alpha values. Lastly, all missing values are imputed using EM algorithm in SPSS 22. The estimated values have been rounded to integers. The results of the imputation have been checked for outliers and are plausible insofar as the estimated values range consistently between 1 and 7.

Measurement models

Treating the variables as ordinal, the measurement models were validated by conducting confirmatory factor analyses using Mplus 6.2. For the estimation, we used the *weighted least squares estimator with mean and variance correction* (WLSMV), which is appropriate for analyses based on categorical data (Brown 2006). Table 2 shows correlations between the latent constructs. No post-hoc modifications have been done.

According to the criteria defined by Hu & Bentler (1999), RMSEA and CFI (both based on ChiSquare Statistics) can be considered as good (CFI = 0.97, RMSEA = 0.054, $p_{close} = 0.228$). The Chi-Square value is significant ($\chi^2 = 500.1$, $df = 322$); however, the model is not reproducing the empirical correlation matrix ($p = 0.000$). Possible reasons for this could be the large number of variables and latent constructs. Yet the satisfying results for RMSEA and CFI, which take the consequences of model complexity with regard to the Chi-Square value into account, deliver strong arguments for the usefulness of our measurement model.

Table 2: Correlations between latent constructs in confirmatory factor analysis

N = 189

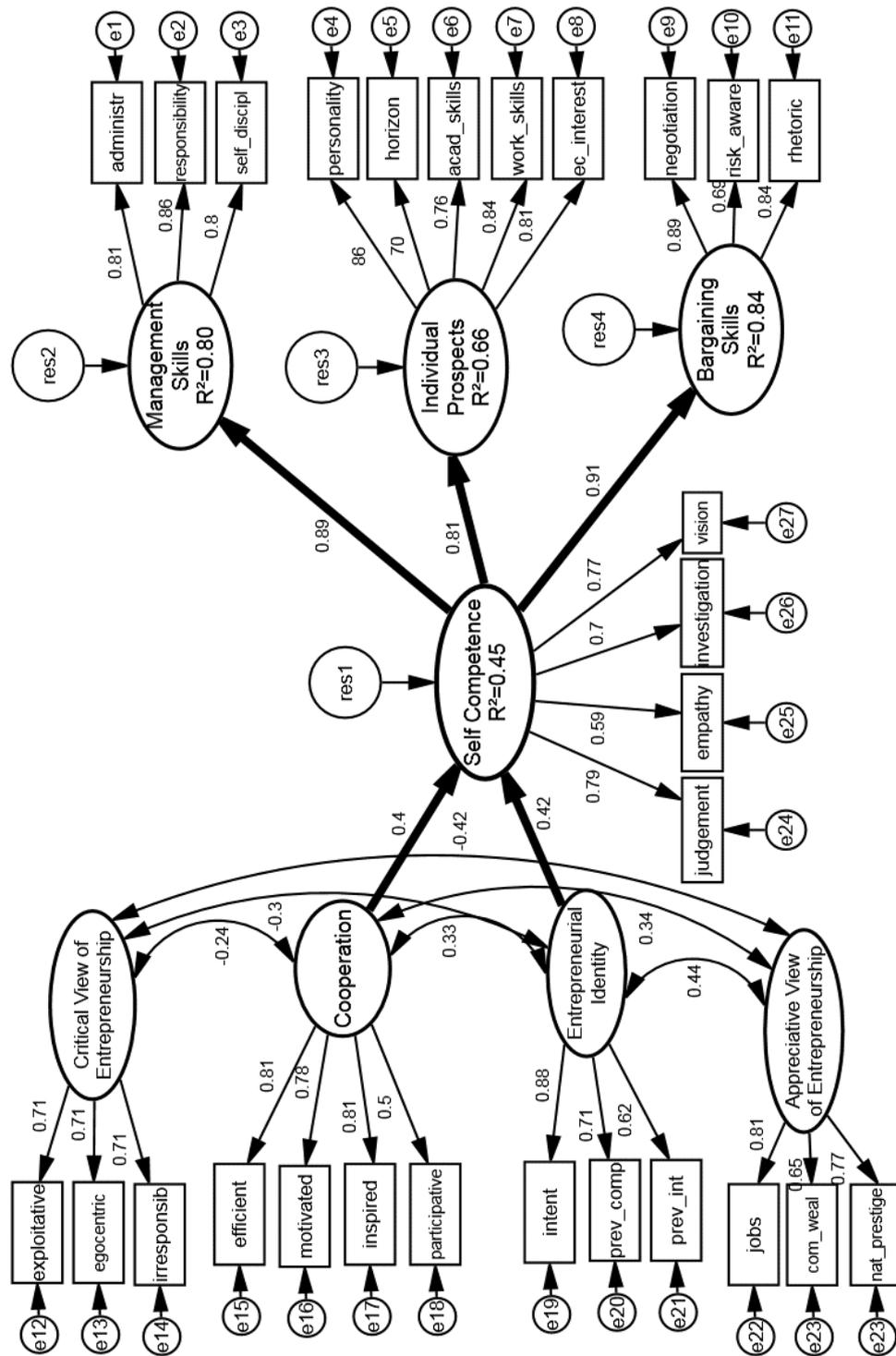
	Self Competence	Management skills	Individual prospects	Bargaining skills	Critical View of Entrepreneurship	Cooperation	Entrepreneurial Identity	Appreciative View of Entrepreneurship
Self Competence	1							
Management skills	0.56	1						
Individual prospects	0.51	0.52	1					
Bargaining skills	0.65	0.56	0.57	1				
Critical View of Entrepreneurship	(-0.09)	-0.12	-0.13	-0.11	1			
Cooperation	0.24	0.34	0.37	0.35	-0.15	1		
Entrepreneurial Identity	0.36	0.37	0.33	0.42	-0.20	0.23	1	
Appreciative View of Entrepreneurship	0.14	0.20	0.23	0.22	-0.24	0.21	0.30	1

Calculated using Mplus 6.1, Estimator: WLSMV, no post-hoc modifications; $\chi^2 = 500.1$, $df = 322$, $p = 0.000$; CFI = 0.97, RMSEA = 0.054; pclose = 0.228; Correlation Coefficients in brackets are not significant (alpha = 5%)

Structural Equation Model

Based on the results of the confirmatory factor analyses, a structural equation model was calculated. See figure 1 for specification.

Figure 1: Structural Equation Model



Results

Four latent constructs are used in our model as independent variables: the *cooperation in the mini-companies*, the *entrepreneurial identity* and both the *appreciative* and *the critical views on entrepreneurship*. As a mediator, we use the latent construct *self-competence*. Three latent constructs are used as dependent variables: *individual prospects* and both *management* and *bargaining skills*.

Cooperation and entrepreneurial identity are correlating positively with each other. Both have an almost equal positive effect on self-competence: for cooperation the path coefficient is .42, for entrepreneurial identity .40, while the views on entrepreneurship have no significant effects on the mediator and the dependent variables. The explained variance for the mediator is $R^2=.45$. However, on the level of general social beliefs, neither the appreciative nor the critical view of entrepreneurship has a significant impact on self-competence. Nevertheless, the appreciative view correlates positively with cooperation and entrepreneurial identity, while the critical view is negatively correlated with both constructs as well as the appreciative view.

Self-competence has highly significant effects on the dependent variables of management skills (.89), individual prospects (.81) and bargaining skills (.91). The explained variance for the dependent variables is $R^2=.80$ for management skills, $R^2=.66$ for individual prospects and $R^2=.84$ for bargaining skills.

6. Discussion

The results show that the project experience in terms of perceived cooperation and the individual entrepreneurial identity are important factors for the perceived development of self-competence. Neither the critical nor the appreciative views on entrepreneurship effect the evaluation of the project experience with regard to the

development of competencies, skills and future perspectives. Thus, the views on the social function of entrepreneurship are loosely connected to the project experience and the self-attribution of learning outcomes. However, it should be pointed out that they could contribute to the shaping of expectations in the forefront of the participation in mini-companies.

Overall, the students evaluate the cooperation in the mini-companies as positive and see the participation as successful with regard to their learning progress and to their development as actors in the field of business. The model shows that the development of self-competence is the key to domain-specific skills and competencies: participation strengthens the capacity to define clear goals, to investigate issues thoroughly, to deliver sound judgments and to take the perspective of others in interactive constellations. This general capacity has a stimulating effect on the capacity to act skillful, efficient and self-disciplined in the context of business organizations and on the capacity to deal convincingly with contractors and customers. Moreover, the students have the impression that their learning progress is important for their future because the participation has contributed to their personal maturity, to the enlargement of their horizon, to the development of academic and work skills and to the corroboration of their economic interest. With regard to our hypotheses, the model delivers a mixed picture: some results correspond to our expectations, but other results are surprising and invite self-criticism. Thus, our hypotheses H1 and H2 can be confirmed for self-competence, but must be rejected for management skills, bargaining skills, and individual prospects. Neither cooperation nor entrepreneurial identity have a direct impact on the dependent variables. Since H3 predicted a partial mediation by self-competence, this hypothesis must also be rejected because the model reveals a full mediation of management skills, bargaining skills, and individual prospects. And finally, H4 and H5 must be rejected since there is no impact of the generalized perceptions of entrepreneurship on self-competence, management skills, bargaining skills, and individual prospects.

So how can we explain the shortcomings of our hypotheses? The pattern suggests that we overestimated the impact of domain-specific antecedents of entrepreneurial knowledge and entrepreneurial motivation and that we underestimated the impact of the general capacities of self-competence. The main project experience appears to be the common responsibility for the success of the team. As individuals, the students learn that their commitment can make a difference. The self-perception as a focused, motivated and sincere team player triggers the perception domain-specific learning progress with regard to bargaining, management and work. However, it should be stressed that these conclusions are mitigated by several caveats. First, it must be acknowledged that a cross-sectional study from a retrospective angle cannot shed light on the problem of memory distortion. Research on social cognition delivers many examples for biographical sensemaking that avoids the confession to have wasted time and energy on fruitless activities. A second limitation of our study results from the fact that we had no chance to implement a control-group design. Because participation in YES is mandatory when choosing the commercial track of the involved schools, a strong tendency to approve entrepreneurship is probable. Hence, we have to read the data under the reservation that the sampling was subjected to a self-selection bias. Further research should address both points by choosing a longitudinal control-group design.

7. Conclusion

The students participating in mini-companies founded in the context of *Young Enterprise Switzerland* in 2011/12 evaluate the projects generally as successful and important for their personal development. Learning outcomes with regard to management and bargaining skills as well as prospective training and work are considered important; however, the crucial experience seems to be the increase in self-competence. Thus, the domain-specific effects of entrepreneurial project learning depend strongly on the general ability to pursue a vision, to investigate

problems thoroughly, to ponder information and to take the perspective of others. Clear-defined intentions with regard to entrepreneurial activities and productive teamwork within the mini-companies are perceived as important facilitators of a successful learning process. Views on the social function of entrepreneurship have no direct impact on the evaluation of the projects and the learning outcomes. However, it should be noted that even when the students tend to stress entrepreneurial achievements as important contributions to common welfare, they are not wholly uncritical: many students affirm on one hand the position that entrepreneurship is important for a vital economy, yet affirm on the other hand that creating jobs, delivering goods and implementing innovations can be interlaced with unpleasant traits of entrepreneurship. This mixed picture implies that the positive assessment of the participation in entrepreneurial project learning does not depend on an intrinsic motivation that is based on the assumption that entrepreneurship is, on the whole, a beneficial scheme.

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