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Mini-companies as "greenhouses" of economic competence: a longitudinal study of "Young Enterprise Switzerland"

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Abstract

The paper investigates how Swiss students on the higher secondary level evaluate their participation in mini-companies. Theoretically, the study draws on the concept of project-based learning (PBL). Data was collected in the first and the last stages of the projects and are analyzed by structural equation modelling (SEM). The analysis shows that the students display relatively stable attitudes regarding the development of specific business skills and regarding the impact of participation on the general development of competencies.

Keywords: Entrepreneurship education, Mini-companies, Project-based learning

Background

This study offers a longitudinal perspective on how learners who participated in mini-companies in Swiss higher secondary schools viewed the experience. Designed as a form of project-based learning in business education, mini-companies require real investments and active marketing on a small scale. During the school year 2012/13, students were questioned both in an early stage and at the end of the project on their business ideas, team cooperation, their views on entrepreneurship, learning motivation, and the development of skills and competencies. The paper analyzes their self-assessment regarding entrepreneurial skills and the impact of the project on personal development.

As an affiliation of *Junior Achievement-Young Enterprise* (JA-YE) Europe, *Young Enterprise Switzerland* (YES) is part of a global movement in entrepreneurship education (Quesel et al., 2015). In the academic year 2012/13, more than 600 students on the upper secondary education level participated in the YES *Company Programme*. The general decision to participate is made by teachers and school 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, although they can opt for other business-related projects in some cases.

Within the scope of the YES program, students establish a mini-company to develop, implement and market either a product or a service. Mentored by teachers and supported by former participants as well as honorary business consultants, the teams organize themselves in order to realize their business ideas over the course of the school year. They write a business plan, raise funds, set up the business, and submit a

financial account at the end of the cycle. During the project they participate in workshops and trade fairs organized by YES. While exhibiting their goods at trade fairs, they compete with other mini-companies, first on the regional level, and if successful, nationally. Comparing data of students elected for the national trade fair with data of students participating only on the regional level, the study investigates how the level of success influences the perception of entrepreneurial competence and personal development.

The paper comprises six sections. The first section includes theoretical considerations and empirical insights regarding the concept of entrepreneurship. The second section lays out the concept of entrepreneurship education through mini-companies, while the third discusses existing findings on project-based learning and self-regulated learning. The fourth section presents the research design, while the fifth includes the findings. The results will be discussed in the sixth section, followed by a short conclusion.

Theoretical considerations and empirical insights

According to Jean-Baptiste Say, successful entrepreneurs combine highly developed organizational skills on the one hand, with a sense for risks and opportunities on the other, in order to make profits (Say 1803, p. 375). In market economies, the entrepreneurial search for innovative solutions eliminates established industrial and commercial patterns, which results in the failure of outdated enterprises. Hence, entrepreneurial innovation can be regarded as "creative destruction" (Schumpeter 1944, pp. 81–85). Innovate solutions are not limited to new, better or cheaper products and services; they can also reshape social relations and whole societies. In this regard, it is argued 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 age of information technology and automation opens new possibilities to leave corporate management style behind, thus heralding an "entrepreneurial society" shaped by myriads of new ventures (Audretsch, 2007; Gavron, Cowling, Holtham & Westall, 1998). According to this vision, the concomitant change of social attitudes will lead to an "entrepreneurial ecosystem" based on a strong general sense of ownership (WEF 2009, p. 10).

Among the approaches to entrepreneurship, three are relevant to this study, namely the normative, the critical and the realistic. Normative concepts of entrepreneurship stress the point that "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, p. 2). In this sense, "entrepreneurs are essentially ideas people, who seize an opportunity to generate value or well-being in society" (UNESCO & ILO 2006, p. 5). Whereas normative concepts of entrepreneurship tend to idealize the consonance between individual success and social welfare, critical notions of entrepreneurship stress that such an idealization is based on the fallacious identification of entrepreneurship and modern identity (Bröckling, 2015). This equation masks an over-estimation of opportunities for entrepreneurial success, leading to the self-attribution of failures that are in reality rooted in social disparities. The invocation of a society where everybody can achieve as an entrepreneur tends to blur the fact that even highly developed countries are afflicted by poverty and marginalization that undermine the formal equality of opportunities. Hence, the praise of entrepreneurial self-fulfilment can

reinforce the meritocratic illusion that success is a personal achievement, while it is in fact the result of privileged social conditions (Bourdieu & Passeron, 1990).

Differing from both the normative and the critical concepts of entrepreneurship, a third strand of thought focuses on entrepreneurship in ordinary life. This realistic understanding of entrepreneurship stresses the fact that most successful entrepreneurs are not glamourous individuals with great visions for the future but rather common people — the average next door neighbor (Shane, 2008). In many cases, the entrepreneurial activity of this group is limited to self-employment and is quite often an improvised solution to avoid unemployment. Moreover, most entrepreneurial ventures are not based on an innovative idea but rather imitate existing enterprises. From the viewpoint of the realistic concept of entrepreneurship, this imitation however seldom succeeds: about eight out of ten new ventures declare bankruptcy in the first two years. Frequently failing first ventures are followed by failing second or third attempts—successful learning from failure is the exception.

Entrepreneurship education largely takes the normative approach that praises venturing as an act of self-actualization. Thus, mini-companies are promoted as opportunities for the development of competencies and skills that are considered important for success in the twenty-first century.

Entrepreneurship education through mini-companies

Regarding the *good practice* requirements for the educational use of mini-companies, an EU expert report (European Commission, 2006) highlights the following criteria:

1. Projects should focus on collaboration and the social skills required for successful teamwork;
2. Projects require qualified educational mentoring;
3. Project teams must have constant opportunity to obtain support from external experts;
4. Learners must have the freedom to develop their own ideas, and they have to be responsible for the implementation of their ideas.

The expert report emphasizes that the success of mini-companies cannot only be deduced from the balance sheet, but must also be evaluated in light of the educational objectives. The importance of personal attributes like creativity, assertiveness, critical thinking or self-confidence is stressed with regard to the development of students' business competencies. In this perspective, leadership and the taking of calculated risks are personal attributes, while basic economics and entrepreneurial thinking belong to the business skills required for the successful management of a mini-company (European Commission 2006, pp. 17–18).

Evaluation studies on mini-companies confirm the importance of these skills, and indicate that these companies can contribute significantly to the clarification of career interests (Athayde & Hart, 2000; Hekman, 2007; Johansen, Schanke & Clausen, 2012). Participation in mini-companies does not, however, necessarily strengthen entrepreneurial intentions (Josten & van Elkan 2010), and can even result in disillusionment regarding prospective self-employment (Oosterbeek, van Praag & Ijsselstein, 2008). A

comparison between non-participating youth and three cohorts from the Swedish Junior Achievement Company Program shows that participation increases the long-term probability of starting a firm, but concludes that participation has no effect on the survival of firms (Elert, Andersson & Wennberg, 2015).

The expert EU report argues that mini-companies should not be "directly focused on the creation of new businesses" (European Commission, 2006, p.11). Rather, they should contribute to a new "entrepreneurial culture" and should diffuse the "entrepreneurial mindset" within the whole of society: "In fact, learning about entrepreneurship will include developing personal qualities such as creativity, taking initiative, responsibility, which will prove generally useful in life and in any working activity" (European Commission, 2013, p.3). Proclaiming entrepreneurship as a "key competence for life", an evaluation report of the European Commission stresses that citizens can take advantage of entrepreneurial thinking "in both their professional and private lives" (European Commission, 2015, p.13). In a comparison of different strategies to develop such thinking, the evaluation concludes that entrepreneurship is "best taught through methods that include real-life conditions" (European Commission, 2015, p.89).

In similar vein, Junior Achievement Worldwide emphasizes that learning in mini-companies is marked by "a strong 'hands on – learn by doing' underpinning" (JA Worldwide, 2015a, p.6), which is not only beneficial for commercial activities, but also "helps to nurture the talent and energy of young people, building confidence, improving decision-making and fostering self-reliance" (JA Worldwide, 2015b, p.9). Entrepreneurial learning is considered a general asset, because the students "improve essential competencies such as creativity, initiative, tenacity, teamwork, understanding of risk and a sense of responsibility" (JA Europe, 2015, p.6).

Project-based learning and entrepreneurial activities

Project-based learning and entrepreneurship education chime well and can therefore be meaningfully combined. To begin with, since entrepreneurship is essentially project oriented, it makes sense that entrepreneurship education should be project-based too (Damon, Bronk & Porter, 2015; Geldhof et al., 2014). In addition, in both school-related projects and in "real life" market economy activities, opportunities have to be identified, evaluated and explored, and this despite the differences between the levels of risk-based decision-making in school projects compared to entrepreneurial projects in "real life". Furthermore, even though learning outcomes cannot be equated with commercial profit, in both cases time, intelligence and other resources are invested under contingent conditions to achieve a goal. While there is an entrepreneurial trait in every school project, this is especially strong when this project is a mini-company. Because they mix learning outcomes and commercial profit, mini-companies therefore constitute a special case of school-related projects.

Rooted in the tradition of progressive education, project-based learning has been established as a child-centred education strategy in which teachers provide challenging learning environments with opportunities for self-directed meaningful activities under pedagogical guidance while also trying not to determine learners' thinking (Dewey, 1897; Kilpatrick, 1929). Soon the focus of the approach was enlarged from children to other age groups, thereby generating general concepts of self-directed learning. These

concepts focus on the idea that levels of self-regulation during the learning process influence learning outcomes (Boekaerts, 1999; Butler & Winne, 1995; Pintrich, 2003; Zimmerman, 2002). And they stress the point that the freedom to choose themes, instruments or strategies enhances students' motivation and creativity (Blumenfeld et al., 1991; Krajcik & Blumenfeld, 2006).

Over the course of the twentieth century, different strands of educational psychology have supported this approach, each emphasizing various strengths and pointing out the requirements of meaningful projects. Empirical studies in educational psychology find evidence that project learning has a positive impact on learning activities, effective performance, learning behavior, achievement motivation, as well as on the expression and refinement of learners' identities through collaborative efforts. Deci and Ryan's self-determination theory is supported by findings which indicate that the perception of autonomy associated with project-based learning promotes learning activities and effective performance (Deci & Ryan, 2012; Ryan & Deci, 2009). Field experiments show that learning arrangements which support autonomy also improve learning behavior (Vansteenkiste et al., 2004; Vansteenkiste, Lens & Deci, 2006). Eccles and Wigfield (2002) argue that achievement motivation is enhanced by goals related to self-conception and by the perception of social incentives and costs. Individual expectancies for success, they argue, are based on learners' confidence in their ability to master the challenge posed by the task, while the tasks themselves are considered in the light of importance, usefulness and pleasure (Eccles & Wigfield, 2002; Wigfield & Cambria, 2010; Wigfield & Eccles, 2000). Students' task persistence will depend on the difficulty of attainment, the relation between anticipated output and emerging costs, and the intrinsic value of the subject matter. The intrinsic value of projects will be higher when learners perceive the projects as shared and self-directed. Project-based learning in school also ideally provides the possibility to "express and refine one's identity" through collaborative efforts, since the experience of meaningful activity in participatory settings is positively related to learning progress (Barber, Abbott, Blomfield Neira and Eccles, 2014, p.10). In the same sense, Krajcik and Blumenfeld (2006) argue that successful projects start with a driving question which students explore collaboratively through "authentic, situated inquiry" (p. 318).

While one strand of school-related projects focuses on self-directed research, a second strand focuses on community engagement and civic responsibility. Based on the principle that student activities should be linked to the common good, the latter approach combines learning goals with a range of community services (Youniss et al., 2002; Youniss, 2007). Mini-companies, in turn, represent a third strand of school-related projects. In this third strand, while inquiry does constitute an important component of student activities, it is subordinated to the commercial goals of the project: students have to engage in market research in order to define lucrative opportunities. Although the activities provide services, these services are not supposed to be altruistic. Rather, students have to pursue profitable services according to the liberal principle that prudent egoistic market behavior will promote public benefit.

School projects can differ with regard to the significance of both service provision and competition. A strong emphasis on collaborative learning or helping efforts may lead to the misperception of school-related projects as essentially non-competitive. However, mini-companies in the context of YES combine collaboration amongst

learners with competition for both market and academic success. Since entrepreneurship education requires solutions that are both practical and competitive, this study focuses on the relation between, on the one side, the perception of competence development and, on the other side, success on the level of trade fairs.

Methods

The study is based on two online questionnaires sent to all participating students at the beginning and at the end of the program. The first questionnaire focused on motivation, self-attributed economic competencies, expected learning outcomes, entrepreneurial intent, general views on the function of entrepreneurship in modern society, and expectations regarding the project. In the second wave, four scales from the first wave were repeated, namely questions concerning motivation, self-attributed competencies, entrepreneurial intent, and the function of entrepreneurship. These were supplemented by questions regarding the formation, development, and success of the mini-companies, and by questions concerning the project outcomes.

Data collection

The study population consisted of 607 students. A pre-post-design was used. The return of the questionnaires in the first round led to a sample of 385 cases, and in the second round to 174 cases. For 122 cases, a match between pre- and post-survey could be established, which is a satisfactory rate for a longitudinal design.

At the first round, all participants were aged between 14 and 20 years, with the average age of 17.0 years (SD 1.1 years), and a median age of 17 years. The absolute number of male respondents was 61(50.8%); 59 were female (49.2%). Two students did not provide information about their age and gender.

All items were 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 were rated on a scale from “I do not agree at all” to “I totally agree” and at other times on a scale from “very low” to “very high”.

In the first round, data were gathered between October and November 2012 with an online EvaSys 5.0 survey. At that point in time, the mini-company teams had defined their business ideas and were about to draft the business plan. In the second round, data were collected between April and May 2013. At this point in time it was clear which companies had been selected to participate in the national fair and the final competition.

In order to avoid misuse of the survey, access was restricted by individual transaction numbers. Anonymity was secured by randomly assigning transaction numbers to the email addresses of potential participants. The data analyses were performed using IBM SPSS Statistics 22 and Mplus 6.1 (Muthén & Muthén, 2012).

Hypotheses

The confirmatory factor analysis and the structural equation modelling are based on two scales: agency and outcome. Regarding economic competencies, *agency* defines the self-perceived skill to present, argue and negotiate convincingly in a commercial context. The scale *outcome* includes items concerning the success of the mini-company in

relation to the collaborative marketing of a product or service as well as the impact of participation in the mini-company on academic and work skills, employability and personality development. The model includes a distinction between high and low achievers using a variable that measures the selection of mini-companies for the national fair and thus for the final round of the national competition.

The cross-lagged model hypothesizes that agency at t1 has a positive effect on agency at t2 (H1) and that outcome at t1 has a positive effect on outcome at t2 (H2). With regard to cross-lagged effects, it is expected that agency at t1 has a positive effect on outcome at t2 (H3); correspondingly, outcome at t1 should have a positive effect on agency at t2 (H4). Thus, the model expresses the tendency that retrospective self-assessment of the participation will confirm a positive self-perception (see Fig. 1). The external assessment of projects is addressed through the dummy variable selection for the national fair. Thus, exclusion from the national fair counts as an indicator for low achievement while inclusion counts as an indicator for high achievement. Regarding the difference between high and low achievement, it is expected that a positive external evaluation corroborates positive self-perceptions. Thus, selection for the national fair will have a positive effect on agency at t2 (H5) and on outcome at t2 (H6).

Results

Table 1 shows variables of the measurement models for the pre- and post-survey as well as the corresponding numbers of valid cases and descriptive statistics. The reliability of the scales is measured using Cronbach's alpha, which is (for all but one scale) higher than 0.8, indicating good quality. For the scale outcome t1, Cronbach's alpha is 0.75, indicating a satisfactory quality. All missing values are imputed using the EM algorithm in IBM SPSS Statistics 23. 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.

The number of missing values ranges between 0% and 4.1%. All variables have missing values below the threshold of 5%, commonly stated as the threshold for a single imputation. All items are more or less left-skewed, which could indicate a self-selection bias, as it can be expected that students opting for economics as a principal subject are inclined to express rather positive views on competence development in this field. However, all except three items show values in skewness below 1 in absolute values. The arithmetic means confirm the indicated tendency toward positive views, as most variables have a mean around 5, while the center point of the scale is 4. The standard deviations range between .8 and 2.0.

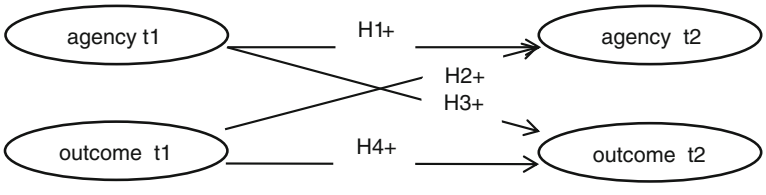

Fig. 1 Baseline structural model. H1+ to H4+ indicate hypothesized positive effects

Table 1 Descriptive statistics

	Valid Cases	Missing %	Mean	Median	Std. Dev.	Skewness	Cronbach's alpha
Agency - t1							
Convince	122	0.0	5.4	6	1.2	−1.1	0.83; *N* = 120
Negotiate	120	1.6	5.1	5	1.0	−0.6	
Present	122	0.0	5.3	5	1.3	−0.7	
Agency - t2							
Convince	121	0.8	5.6	6	1.2	-0.7	0.8; *N* = 116
Negotiate	117	4.1	5.2	5	1.4	−1.0	
Present	121	0.8	5.6	6	1.2	1.1	
Outcome - t1							
Acad_skills	120	1.6	5.3	5	1.1	−0.2	0.75; *N* = 117
Work_skills	121	0.8	5.9	6	1.0	−0.9	
Employability	121	0.8	6.2	6	0.8	−1.4	
Personality	121	0.8	5.5	5	1.1	−0.6	
Success	120	1.6	5.5	6	1.2	−0.6	
Outcome - t2							
Acad_skills	118	3.3	4.8	5	1.7	-0.6	0.8; *N* = 114
Work_skills	119	2.5	5.5	6	1.4	−0.8	
Employability	121	0.8	5.7	6	1.4	−0.9	
Personality	121	0.8	5.5	6	1.4	−0.7	
Success	119	2.5	4.8	5	2.0	−0.5	

Number of Cases in dataset: 122

Measurement models

Treating the variables as ordinal, the measurement models were validated by conducting confirmatory factor analyses using Mplus Version 6.1. For the estimation, the *Weighted Least Square Estimator with Mean and Variance Correction (WLSMV)* has been used. The number of cases is 122, and missing values are imputed by Full-Maximum-Likelihood-Approach in Mplus. Due to a low number of missing values (see Table 1 – descriptive statistics), this imputation method can be considered suitable. Table 2 shows the correlations between the latent constructs.

According to the criteria defined by Hu & Bentler (1999), RMSEA and CFI (both based on Chi-Square Statistics) can be considered as fair (CFI = 0.98, RMSEA = 0.056, *pclose* = 0.318). The Chi-Square value is significant (χ^2 = 124.8, *df* = 90); however, the model does not reproduce the empirical correlation matrix (p = .01). Yet the satisfying results for RMSEA and CFI, which consider the consequences of model complexity of the Chi-Square value, deliver strong arguments for the adequacy of the measurement model.

Table 2 Correlations between latent constructs in confirmatory factor analysis

N = 122	agency – t1	agency – t2	outcome – t1	outcome – t2
agency – t1	1			
agency – t2	0.70	1		
outcome – t1	0.40	0.45	1	
outcome – t2	0.26	0.38	0.67	1

Calculated using Mplus Version 6.1, *N* = 122; Estimator: WLSMV; χ^2 = 124.8, df = 90, p = 0.0089; CFI = 0.98, RMSEA = 0.056 (0.029; 0.079); pclose = 0.318

Structural equation model

Based on the results of the confirmatory factor analyses, a baseline structural equation model was calculated (see Fig. 2 for specifications). The baseline model did not include a moderator. Fit models of the baseline model are comparable to the confirmatory factor analysis model (Software: Mplus Version 6.1, N = 122; Estimator: WLSMV; $\chi 2$ = 124.8, df = 90, p = .0089; CFI = 0.98, RMSEA = 0.056 (0.029; 0.079); pclose = 0.318).

In a cross-lagged panel design with two latent constructs (agency and outcome) measured at two times (t1 and t2), six relationships are possible (Kenny, 2005). One of the two cross-sectional relations, namely the correlation between agency t1 and outcome t1, has a medium to strong significant effect (.40), whereas the other correlation between agency t2 and outcome t2 is weak and not significant (0.16, p = .126).

Our four research hypotheses focus on two stability relations and two cross-lagged relations. Hypotheses H1 and H2 test stability relations. As shown in Fig. 2, agency t1 has a strong significant positive influence on agency t2 (H1) with a standardized path coefficient of .63. Outcome t1 has a strong significant effect on outcome t2 (H2) with a standardized coefficient of .68.

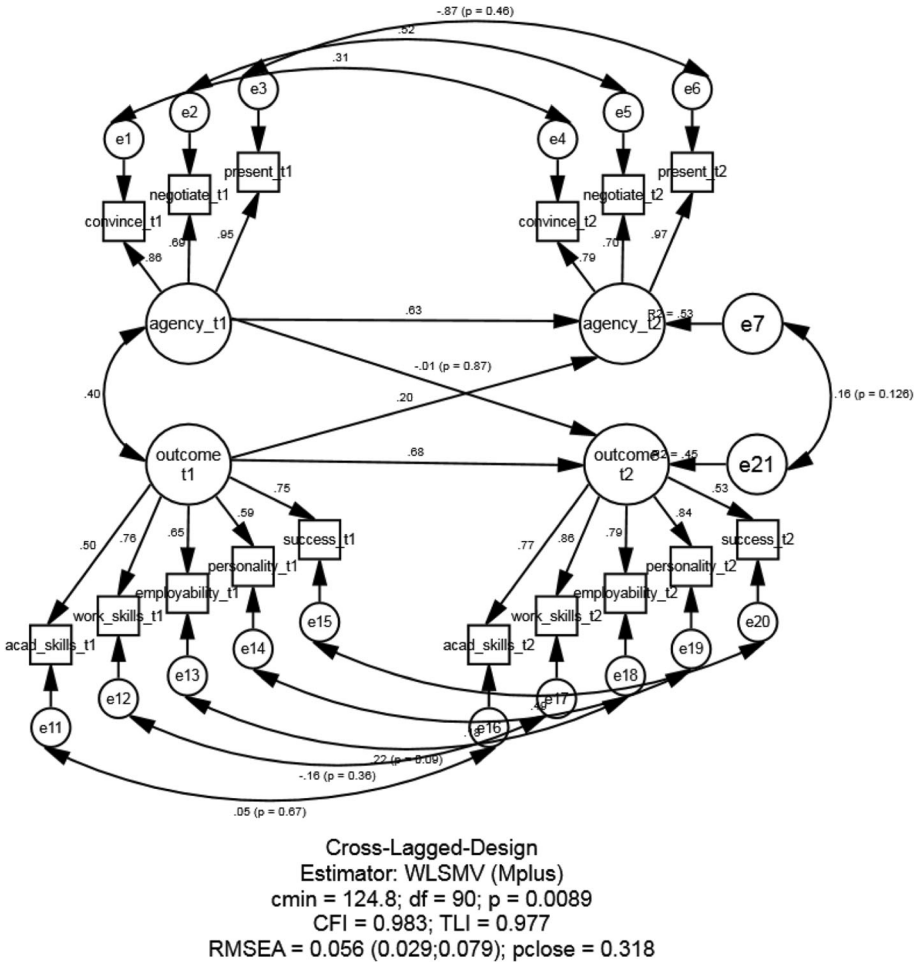

Fig. 2 Baseline model (N = 122). Coefficients with p-values in brackets are not significant (alpha = 5%)

Considering the cross-lagged relations, empirical findings do not support hypothesis 3; agency t1 has no significant influence on outcome t2 (H3) with a standardized coefficient of −.01 (p = .126). Hypothesis 4 is supported by empirical findings, in that outcome t1 has a significant influence on agency t2 with a standardized regression coefficient of 0.20.

Influence of the moderator for high or low achievement

In the next step, the moderator for high or low achievement was included in the model (see Fig. 3). The dummy variable FAIR t2 represents the answers to the selection of mini-companies on the national level in the second wave of the survey. The results show that the stability relations between agency t1 and agency t2 (standardized coefficient 0.61) and outcome t1 and t2 (standardized coefficient 0.58) remain relatively unchanged compared to the structural equation model without the moderator.

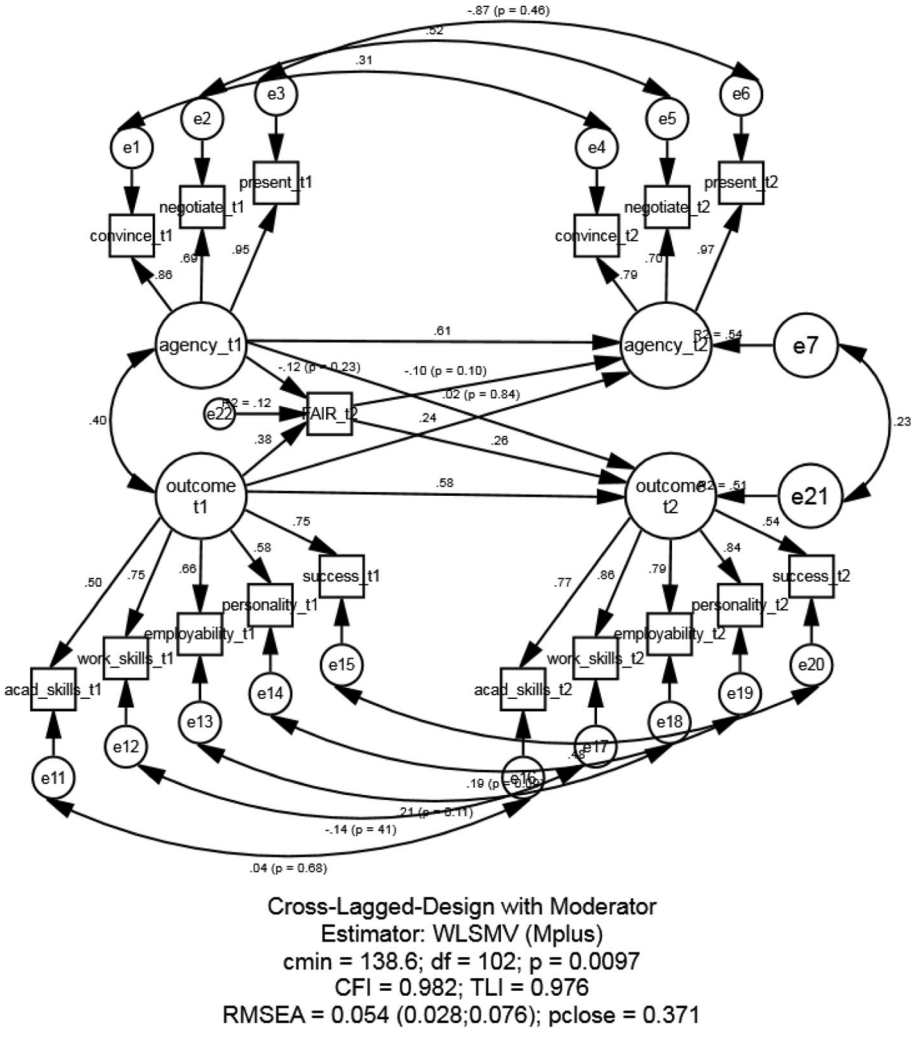

Fig. 3 Cross-lagged-design with moderator (N = 122). Coefficients with p-values in brackets are not significant (alpha = 5%)

However, a slightly different picture emerges with respect to the cross-lagged relations (see Table 3). Taking into consideration the moderator FAIR t2, the effect of agency t1 on outcome t2 remains not significant (standardized coefficient 0.02, p = .837). The effect of outcome t1 on agency t2 remains significant (standardized coefficient 0.24). FAIR t2 is differently influenced by agency t1 and outcome t1, in that agency t1 has no significant influence on FAIR t2 (standardized coefficient – 0.12, p = .225) while outcome t1 does have a significant medium influence (standardized coefficient 0.379) on FAIR t2. FAIR t2 has a medium significant influence on outcome t2 (standardized correlation coefficient.262) and no significant effect (standardized coefficient – 0.10, p = .103) on agency t2. Hence hypothesis 5 has to be rejected, whereas hypothesis 6 is confirmed by the data.

Discussion

The structural equation modelling shows that the constructs agency and outcome remain stable over time, which confirms hypotheses 1 and 2 and indicates that students' competence-related expectations at the beginning of the projects are good predictors for their self-assessment at the final stage of the projects. On the one hand, students see the development of their mini-companies as a validation of potential business skills. On the other hand, the anticipated learning progress as related to future careers is confirmed in retrospect. This is in accordance with the expectancy-value theory of motivation (Wigfield & Eccles, 2000), which suggests that the expectation of success and the value that students place on a goal determine the project-related development of self-images. In the case of the mini-companies, students' self-images are corroborated both on the level of skills and on the level of future perspectives, wherein higher expectations ex ante lead to a higher level of self-attributed success ex post.

The results regarding hypotheses 3 and 4 deliver a mixed picture: while anticipated outcome significantly effects the post hoc perception of agency, the effect of anticipated agency on the post hoc perception of outcomes remains not significant. This may be explained by the difference between general and specific expectations: the specific anticipation of progress concerning business skills may have limited effect because not all students intend to pursue a business career, whereas the general anticipation of learning outcomes implies the growth of business skills.

The introduction of the moderator concerning the selection of mini-companies for the national fair supports this view. Specific anticipations concerning the growth of business skills focus on individual performance within the project team. The individual fulfillment of tasks within the team does not guarantee successful cooperation; thus, the focus on the self does not imply collective success. While the items of the scale "agency" talk about "me", the perspective of the scale "outcome" is different: the items

Table 3 Effects in cross-lagged-design with moderator FAIR (t2)

N = 122	agency – t1	agency – t2	outcome – t1	outcome – t2
agency – t1	-			
agency – t2	0.61	-		
outcome – t1	0.40 (Corr.)	0.24	-	
outcome – t2	0.02 (p = 0.837)	0.227 (Corr.)	0.579	-
FAIR t2	–0.12 (p = 0.225)	–0.103 (p = 0.151)	0.379	0.262

are formulated as universal statements concerning the entire group of students. Thus, the expectations are more team-related than the personal stance taken concerning the growth of business skills. Consequently, the expressed views on project outcomes have stronger implications regarding collective efforts and collective success.

It must be taken into account though that measuring achievement by means of selection for the national fair is a considerable simplification. Student participation in mini-companies provides learning opportunities over almost a whole academic year, and there may be achievements that cannot be calculated on the level of collective effects. This includes the selection of project teams by a jury when considering the business plans, the balance sheets, as well as marketing activities on the internet and at regional fairs. Therefore, the insignificant effect that selection for the national fair has on the perceived validation of business skills implies that students' self-image is partly independent of external feedback. In this sense, learning progress cannot be reduced to competitive success.

In considering the explanatory power of the results, different caveats must be taken into account. These caveats include the fact that the projects were limited to a period of one academic year and that the actual study from t1 to t2 was limited to 8 months, and the fact that student self-attributions cannot be related to career choices after graduation from senior high school. Accordingly, future research should consider students' development after the end of their projects and analyze the choice of vocational fields and university subjects. Furthermore, the analysis should also take traits like self-efficacy and the general academic success of students into account. Lastly, in order to address the problem of self-selection bias, it is desirable to make comparisons with students who do not participate in such mini-company projects.

Conclusion

Swiss students on the higher secondary level who participate in Young Enterprise Switzerland's company program show relatively stable attitudes toward the development of specific business skills and the impact of participation on general competence development. The students' general expectations have a significant effect on their success, measured by selection for the national fair and the final round of the national competition. However, selection for the national fair does not significantly influence the self-attributed growth of business skills. In this regard, students' internal feedback does not depend on the external feedback by the jury, who carefully scrutinize mini-companies' business plans, financial figures, and marketing activities. Thus, learners take an individual perspective when it comes to their perceptions of their own business skills, while they focus on the team-related effects of participation when it comes to their perceptions of the development of competencies.

Authors' contributions
CQ designed the study, participated in the data analysis and the interpretation of results and drafted the manuscript. GM performed the statistical analysis and participated in the interpretation of results. SB contributed to the theoretical framework und to the interpretation of results. All authors read and approved the final manuscript.

Competing interests
The authors declare that they have no competing interests.

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