
Increasing entrepreneurial intention: effective entrepreneurship course characteristics

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Abstract: Ajzen's model of planned behaviour was used to measure the impact of specific entrepreneurship course characteristics on entrepreneurial intention. Course characteristics with a hypothesised positive influence on entrepreneurial intention were identified through literature research and an exploratory study. The hypotheses were tested with a quantitative study which was designed as an ex ante/ex post measurement. Course elements such as business planning activities, role models, student-oriented teaching and feedback processes are efficient components to increase entrepreneurial intention through its antecedents.

Keywords: entrepreneurial intention; effectiveness; entrepreneurship; course characteristics; pedagogy; theory of planned behaviour; attitudes; subjective norms; behavioural control; entrepreneurship education.

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1 Introduction

Research has shown that there is a significant relationship between entrepreneurial training and the propensity to become an entrepreneur (Fayolle et al., 2005; Kolvereid and Moen, 1997; Noel, 2001; Tkachev and Kolvereid, 1999; Varela and Jimenez, 2001). The correlation between entrepreneurship training and entrepreneurial intention is intriguing if we consider the economic relevance of entrepreneurial activity mentioned by various authors: entrepreneurial behaviour, the creative destruction leading to innovation (Schumpeter, 1997), increases the economic wealth of nations and can be one element which contributes to the improvement of the economic condition of entire countries.

The necessity of including the promotion of entrepreneurship in education programmes becomes evident if we consider both the possibility of changing

people's intentions and the economic relevance. The growing importance of entrepreneurship classes in research and education (Katz, 2003) shows that this thought is already being taken seriously. This is not only the case for the USA, but also for Germany, with more than 70 university chairs related to entrepreneurship (Klandt et al., 2008). With such large resources invested in entrepreneurship education, the importance of doing so wisely and effectively is growing. So far, empirical studies have mainly focused on the question of whether or not classes in entrepreneurship have an influence on the decision to become an entrepreneur – a question which has already been answered positively. Less attention has, however, been paid to the question of whether or not the chosen educational variables are effective (Fayolle et al., 2005). Therefore, it is necessary to ask which content should be taught in which manner to achieve impact on the participant's intention to become an entrepreneur. Thus, the study focuses on the question of how specific characteristics of entrepreneurship courses influence the intention to become an entrepreneur. With that, the study will increase the theoretical understanding of entrepreneurship training effects. Besides the theoretical contribution, the results have practical implications on curriculum design.

The paper¹ is structured as follows. The theoretical foundations used throughout the study are described in Section 2. Section 3 describes how the hypotheses were derived from literature research and from the exploratory study. The method section (Section 4) provides an overview of the methods used to test the hypotheses. The results are presented in Section 5. Conclusions and limitations of the research are discussed in Section 6.

2 Theoretical foundations

2.1 Effectiveness of entrepreneurship courses

Various studies have been conducted to show whether entrepreneurship classes have an influence on the entrepreneurial intention or actual entrepreneurial activities. Kolvereid and Moen (1997) showed that students with a major in entrepreneurship have a higher intention to become entrepreneurs and are more likely to found companies. This is an observation, which has been confirmed by Noel (2001), who pointed out that students who graduated in entrepreneurship reached higher scores in entrepreneurial intention and entrepreneurial self-efficacy than students who graduated in other disciplines. Along the same line, Varela and Jimenez (2001) revealed that there is a correlation between a university's investment put into the promotion of entrepreneurship and the percentage of students becoming entrepreneurs. Also, Tkachev and Kolvereid (1999) observed that the intentions of students to become self-employed could be increased through entrepreneurship classes. These results were confirmed by Fayolle et al. (2005), who showed that attitudes and intentions towards becoming an entrepreneur can be influenced through entrepreneurship classes. Souitaris et al. (2007) tested the effect of entrepreneurship programmes on the entrepreneurial attitudes and intentions of science and engineering students. Their results showed that educational programmes raise some attitudes and the overall intention to become an entrepreneur. Inspiration turned out to be the most influential programme-derived benefit. But still, more knowledge about specific course characteristics and their effects on students is needed.

2.2 Ajzen's theory of planned behaviour

One option to capture the effectiveness of entrepreneurship courses would be the measurement of actual start-up activities among former course participants. The problem is that most company foundations arise with a substantial time delay (Fueglistaller et al., 2006). Also, a lot of other influences occur between the participation in entrepreneurship classes and the starting of a company. This makes it difficult to find out to which degree the decision was influenced by the entrepreneurship course.

The usage of intention models can mitigate these problems: intentions have proven to be the best predictors of planned behaviour, especially if the behaviour in question is 'rare, hard to observe, or involves unpredictable time lags', characteristics, all of which apply to entrepreneurial activities (Krueger et al., 2000). A strong intention should eventually result in an attempt to start a new business, even though immediate circumstances can cause a delay (Krueger et al., 2000). Before intention models emerged, researchers followed two other research approaches. One research stream focused on psychological characteristics, general dispositions and personality traits, which were assigned to successful and non-successful entrepreneurs. The other stream focused on demographic factors, such as gender, age or ethnic groups. Both approaches helped to identify relationships between certain traits and demographic factors, but they were both criticised due to methodological and conceptual problems and the lack of explanatory capacity (Linán and Santos, 2007). Intention-based models have proven to be more reliable predictors of entrepreneurial behaviour than models based on individual variables (Krueger et al., 2000).

One of the most advanced intention models is the theory of planned behaviour developed by Icek Ajzen in 1985. Since then, the theory has been applied to numerous settings and is found to be well supported by empirical evidence. Attitudes towards the behaviour in question, perceived subjective norms and perceived behavioural control, explain a considerable variance in actual behaviour (Ajzen, 1991).

According to Ajzen's (2002) theory, the immediate antecedent of behaviour is the intention to perform a given behaviour. Ajzen states that the intention to perform the behaviour can be predicted with high accuracy from three antecedents. The three antecedents can be briefly described as follows: attitudes towards the behaviour are concerned with the belief about the likely outcomes of the behaviour and the evaluations of these outcomes (Ajzen, 2002). Subjective norms refer to a person's perception of the normative expectations of others and a person's motivation to follow these expectations. Perceived behavioural control refers to someone's perception of the ease or difficulty of performing the behaviour, a construct which is more important than the actual control over the behaviour of interest (Ajzen, 1991). Collectively, these factors represent people's actual control over their behaviour. If a person has the required opportunities and resources, and intends to perform the behaviour, he or she should succeed in doing so (Ajzen, 1991).

2.3 Effective teaching methods

Since entrepreneurship as a discipline is rather young, the need to design effective entrepreneurship courses is relatively new. Educational science and related disciplines on the other side have been concerned with these issues for a long time: in 1770, the first chair of pedagogy was founded at the University of Halle in Germany. Since then,

educational science has developed to continually increase our understanding of how the objectives of education can be reached in a better way. In 1951, more than 180 years later, the Coleman Foundation was established: the first foundation with a major focus on entrepreneurship education (Katz, 2003). Therefore, scholars of entrepreneurship must develop an expertise in educational research as well (Bécharde and Grégoire, 2005).

In the following, three concepts of educational science are described. They were selected due to their explanatory power towards the enablement of learning and towards changing attitudes and self-efficacy perceptions.

- *Experiential learning:* People do learn from their experiences and the results of experiential learning can be reliably assessed. Experiential learning means that the learner is in direct touch with the phenomenon. Hence, experiential learning is always linked to personal, subjective experiences which enable learning in an ongoing process (Kolb, 1984). The idea to conceive learning as a process sets experiential learning apart from traditional education theories and behavioural theories of learning. Experiential theories agree with the underlying assumption that ideas are not fixed, but that they are formed and reformed in a process through experiences. Concepts are derived and continuously modified by experience. The learning process integrates experiences, concepts, observations, judgments and actions. In entrepreneurship education, this could mean having students 'sell' their business plans to the class, receive feedback, talk and reflect about the feedback and then go to 'real' venture capitals to gain new experiences, but starting from a higher knowledge level. Another factor which needs to be considered if experiential learning is to be effective is that learning occurs in the interplay between expectation and experience. This means that we always build upon ideas which are already there. As educators, we not only implant new ideas, but also modify old ones. It seems that learning is facilitated when the education process begins with the consideration of the beliefs and theories of a learner, lets him examine and test the ideas so that he or she can then integrate the new or more refined ideas.
- *Changing behaviours and attitudes by addressing emotions:* Changes in behaviours and attitudes can be accomplished by addressing emotions in a targeted way. Behaviour is not only governed through intellect; thinking, feeling and doing influence each other mutually (Martens, 1998). Even though researchers emphasise that complex learning goals can be reached if cognitive and affective areas are considered in an alternating fashion (Martens, 1998), teaching is often limited to cognition, whereas feelings, motives and personal experiences are neglected. Hence, education goals in entrepreneurship education should always include affective learning goals. Certainly, affective learning goals are being addressed, when we invite an inspired entrepreneur to talk to our students.
- *Student-oriented learning:* In terms of didactic approaches, teacher- and student-centred didactics can be differentiated. The teacher-centred approach puts the subject material, which is selected by the teacher, at centre stage. The student-centred approach puts the self-directed learning of the students in the middle and assigns a supporting function to the teacher (Euler and Hahn, 2004). Laurillard (2002) developed a student-oriented, conversational framework which, based on empirical studies, revealed the following aspects as being key to enabling student learning:

- 1 discursive elements like sharing conceptions between teachers and students
- 2 adaptive elements, which imply that students have the responsibility and the chance to receive feedback and consider the feedback in their further studies
- 3 interactive elements, which include teachers providing meaningful intrinsic feedback
- 4 reflective elements, providing students with the chance to reflect on task goals, act accordingly, receive feedback and relate the feedback to their conception of the topic.

The consideration of the four aspects should strongly support student learning.

3 Hypotheses

The hypotheses were formulated based on the results of a literature research and an exploratory study. For the exploratory study, two groups of interviewees were identified as valuable contributors: entrepreneurship educators and former students who had attended entrepreneurship courses held by the respective educators. In the first part of the interviews, the interviewees were asked about the impact of attitudes, subjective norms and perceived behavioural control on entrepreneurial intention. The second part of the interviews targeted on receiving information about the influence of the entrepreneurial training: the interviewees were asked about entrepreneurship course characteristics which had an impact on attitudes, perceived subjective norms or perceived behavioural control in their point of view. The eight semi-structured interviews were designed as 'guided interviews' which means that predefined open-ended questions were used as a guideline for the interview.

Based on the literature review and the interviews, three hypotheses regarding the applicability of Ajzen's model and ten hypotheses regarding the relationship between course characteristics and the antecedents of Ajzen's model were formulated.

3.1 Hypotheses regarding the applicability of Ajzen's model

3.1.1 Theory of planned behaviour

According of the theory of planned behaviour, the intention to perform a certain behaviour is influenced by attitudes towards the behaviour, perceived subjective norms and perceived behavioural control. Together, they explain a considerable variance in actual behaviour (Ajzen, 1991). Multiple authors have successfully applied the theory to career choices in general and to entrepreneurial intentions in specific (e.g., Fayolle et al., 2005; Tkachev and Kolvereid, 1999; Varela and Jimenez, 2001).

The results of the interviews strongly support the influence of attitudes, subjective norms and perceived behavioural control on entrepreneurial intention:

- 1 Interviewees reported that the perceived attractiveness of entrepreneurial activities increased the possibility that entrepreneurship was considered as a career option.
- 2 Also, subjective norms seem to influence entrepreneurial intention. Interviewees with a high intention to start a business repeatedly mentioned that they were influenced and supported by their social environment, primarily by family members

or close friends. An entrepreneurial social environment increases the awareness of entrepreneurship as a career option.

- 3 Perceived behavioural control appears to have an important influence on entrepreneurial intention as well.

Without a strong, overall confidence in one's capabilities, a person will not start his or her own business, given that perceived behavioural control is an essential precondition for entrepreneurial activity.

Thus, the following three hypotheses regarding the applicability of Ajzen's model can be formulated:

- | | |
|--------------|--|
| Hypothesis 1 | Positive attitudes towards founding one's own company increase the level of entrepreneurial intention. |
| Hypothesis 2 | Strong normative beliefs concerning the foundation of one's own company combined with a high motivation to comply positively influence the level of entrepreneurial intention. |
| Hypothesis 3 | Strong perceptions about one's ability to successfully found one's own company positively influence the level of entrepreneurial intention. |

3.2 Hypotheses regarding the relationship between course characteristics and the antecedents of Ajzen's model

3.2.1 Practical knowledge

The effectiveness of practical knowledge towards perceived behavioural control was mentioned quite often in the interviews. Practical knowledge helps to reveal what it takes to become an entrepreneur and in that way helps students to gain confidence about the accomplishment of a certain task. Of course, theoretical course content is important as well, but it is necessary that the linkage to practice is established. Entrepreneurship professors can bridge this gap with different educational measures which range from verbally referring to practical issues during a class room lecture to the assignment of term papers for which students need to solve entrepreneurship-related problems of companies. The results from the literature review about experiential learning support the findings from the interviews. Therefore, the following hypothesis can be stated:

- | | |
|--------------|---|
| Hypothesis 4 | Course characteristics which are highly related to practice positively influence perceived behavioural control. |
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3.2.2 Business planning

Quite often, activities related to business planning are part of entrepreneurship courses. These activities can be described as one specification of practical knowledge. According to the results from the exploratory study, business planning seems to be an effective tool to increase a person's capabilities as well as his or her perceptions about the capabilities to start a company. The most salient point for this is that students become a feeling about the overall picture and the key elements of starting a business. Therefore, the following hypothesis can be stated:

- Hypothesis 5 Entrepreneurship courses which include business planning activities positively influence perceived behavioural control.

3.2.3 Role models

Role models appear to be another element to increase entrepreneurial intention. The observation of and interaction with skilled people encourages learning (Elmore, 1991). Bandura (1997) captures this note in his concept of vicarious experience, which posits that people may ascribe somebody else's attitudes to themselves if they can identify with that person. An effective way to apply this concept to entrepreneurship seems to be the integration of role models in entrepreneurship education. In responding to the question of important course features, many interviewees mentioned entrepreneurs who had been invited as guest speakers. They reported that it had a motivating effect, especially if entrepreneurs were invited whose age or personal/professional history were such that the students could identify with them. It made them think that 'if they could do it, I can do it as well'. A similar reaction seems to be evoked when students understood what the entrepreneurs had done and how they had become successful. This understanding helped them to perceive the foundation of a company as a manageable activity. Based on that, the following two hypotheses can be concluded:

- Hypothesis 6 Courses providing the opportunity to get in touch with role models students can identify with positively influence the attitude towards founding one's own company.
- Hypothesis 7 Courses providing the opportunity to get in touch with role models students can identify with positively influence the perception about one's ability to successfully found one's own company.

3.2.4 Entrepreneurial network

Subjective norms, the perceived expectations from the environment regarding certain behaviours, are determined by a set of normative beliefs. A university provides a social environment as well since students get in touch with other people who might become important others. To influence normative beliefs about starting one's own company, it appears to be necessary to provide opportunities which help students to build a network with peers interested in entrepreneurship and with entrepreneurs. Recommendations from the interviewees include universities providing opportunities to meet other students with entrepreneurial intentions as well as young entrepreneurs.

Also, an awareness of supporting entrepreneurial networks (e.g., incubators) that an individual can fall back on during the foundation of a company could increase perceived behavioural control. Thus, the following two hypotheses can be stated:

- Hypothesis 8 Entrepreneurship courses providing the opportunity to build an entrepreneurial network positively influence perceived subjective norms.
- Hypothesis 9 Entrepreneurship courses providing the opportunity to build an entrepreneurial network positively influence the perception about one's ability to successfully found one's own company.

3.2.5 *Student-orientation*

According to Laurillard (2002), the aim of university teaching is to make student learning possible. Laurillard (2002) states that an empirically-based teaching strategy recommends an iterative dialogue between the teacher and the students with a focus on the topic at hand. The iterative dialogue can be grouped according to discursive, adaptive, interactive and reflective aspects. If all of these aspects are considered, student-oriented learning becomes possible. The aspects mentioned by Laurillard (2002) were also stated in the qualitative study as having a positive influence on attitudes and perceived behavioural control. Therefore, the following hypotheses can be formulated:

Hypothesis 10 Student-oriented courses positively influence the attitude towards founding one's own company.

Hypothesis 11 Student-oriented courses positively influence the perception about one's ability to successfully found one's own company.

3.2.6 *Explorative elements*

According to Bandura (1997), enactive mastery experiences, i.e., experiences to successfully accomplish a certain task, are the most powerful source to strengthen one's self-beliefs. People take these experiences as authentic evidence that they can successfully carry out certain behaviour or achieve certain goals. Hence, successes can build robust self-efficacy beliefs (Bandura, 1997). Learning elements should therefore offer the opportunity to actively acquire learning contents in order to increase perceived behavioural control. Bandura's (1997) results go hand in hand with positive results in the area of experiential learning, where experiences were identified as a central source for learning and development. This was confirmed by the results of the exploratory study. Interviewees emphasised the importance of gaining entrepreneurial experience. Hence, explorative course characteristics which require the students to take an active role in gaining experience should positively influence perceived behavioural control. This leads to the next hypothesis:

Hypothesis 12 Explorative course characteristics positively influence the perception about one's ability to successfully found one's own company.

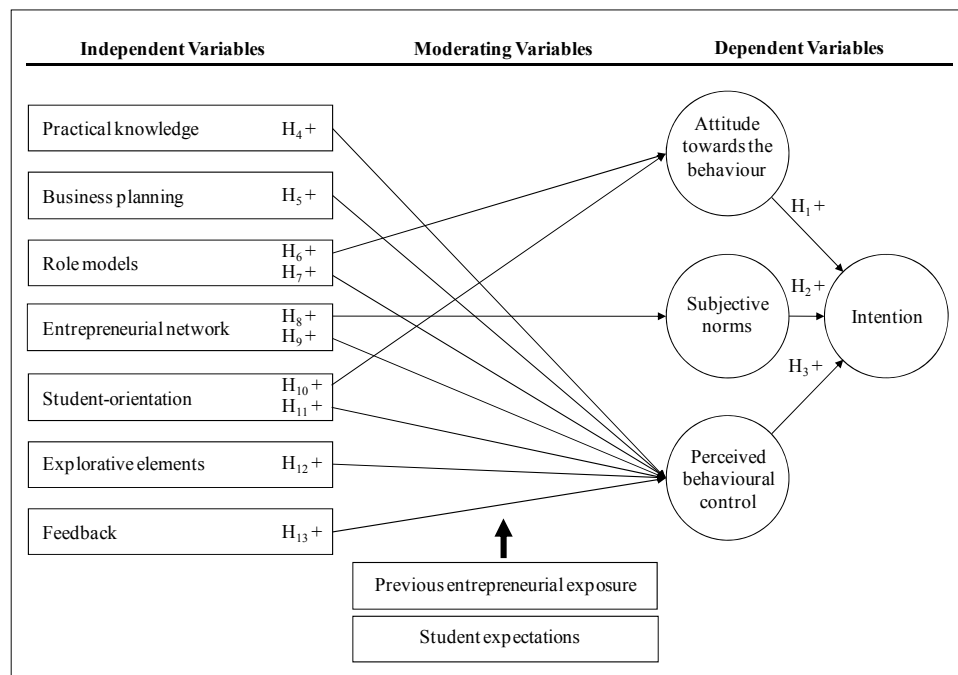
3.2.7 *Feedback*

Feedback seems to be another important element in the learning process. It is already included in Laurillard's (2002) suggestions about student-centred learning and is also mentioned as a central element in experiential learning. It is important to note, however, that the feedback needs to fulfil certain requirements in order to be effective. Laurillard (2002) calls for meaningful and intrinsic feedback that relates to the nature of the task goal. Also, it is important that the person who provides feedback is perceived as being credible and competent. The interviewees confirmed that receiving feedback and integrating this feedback into further thinking and acting is an essential part of learning. For that reason, feedback processes seem to be directly linked to action, and it can be supposed that feedback processes positively influence perceived behavioural control, which leads to the final hypothesis:

Hypothesis 13 Entrepreneurship courses which include feedback processes positively influence the perception about one's ability to successfully found one's own company.

Based on the hypotheses stated above, the conceptual framework presented in Figure 1 was developed. The course characteristics which have a potential effect on the antecedents of entrepreneurial intention serve as the independent variables; the antecedents of entrepreneurial intention serve as the dependent variables. Within Ajzen's model attitudes, subjective norms and perceived behavioural control are the independent variables which influence entrepreneurial intention.

Figure 1 Conceptual framework



4 Method

The hypotheses were tested with a quantitative study. Students who attended one or more entrepreneurship courses during the winter term 2005/2006 were asked to fill out questionnaires at the beginning (ex ante questionnaire) and at the end (ex post questionnaire) of their entrepreneurship courses. The levels of attitude, perceived subjective norms, perceived behavioural control and entrepreneurial intention were measured in both questionnaires to capture the respective delta. Information about educational variables was collected from the students in the ex post questionnaire and from the lecturers, who were asked to fill in questionnaires for their entrepreneurship courses. In total, 464 valid data records from students hailing from 17 different universities in Austria, Germany, Liechtenstein and Switzerland were used in the study.

Most of the students were between 21 and 25 years old. The participants were enrolled in different majors. 66% studied social sciences, 23% engineering and 10% information technology and mathematics (the remaining respondents could either not be allocated to the three clusters or the statement was missing). Most of the students were male (61% male, 39% female).

To measure the dependent variables (attitudes, subjective norms, perceived behavioural control and intention), four indexes were built. Established scales and Ajzen's recommendations for constructing questionnaires to apply the theory of planned behaviour (Ajzen, 2002) were used to compile initial sets of items. The item sets were pretested with a group of students at a German university of applied sciences ($n = 19$). To develop sets of items with a high internal consistency, the number of items was reduced due to item-total correlation and Cronbach's alpha. The final item sets are depicted in Tables A1 to A4 of the Appendix.

Based on the results of the literature research and the exploratory study, seven types of educational measures were identified as being potentially effective in changing entrepreneurial behaviour. They served as the independent variables and were measured as follows. Depending on the variable, the level of the variables was either collected through the students or the course lecturers.

- *Practical knowledge*: The level of practical knowledge conveyed during the course was assessed by the course lecturers on a scale reaching from 1 (essential part of the class) to 5 (marginal part of the class).
- *Business planning*: To measure the level of business planning activities, the entrepreneurship lecturers were asked to state the degree to which the following aspects were part of the class: development of business models, business plan writing and implementing business ideas (scale: 1 = essential part of the class, 5 = marginal part of the class). The index was obtained by summarising all item scores.
- *Role models*: Whether or not an invited entrepreneur serves as a role model depends on individual perception. Therefore, the students were asked to indicate to which degree entrepreneurs' field reports were part of the lecture (item 1), to which degree they admired them (item 2) and to which degree they could identify with them (item 3). Then, the students were asked whether they understood why the entrepreneur was successful (item 4). The scores were summarised to obtain an index for role models.
- *Entrepreneurial network*: An entrepreneurial network can be built from various intersections and different students perceived the value of a network differently. Therefore, the students served as a source to assess the utility of the network. Three different items were used to measure the utility of the network (e.g., get to know potential co-founders). The index was obtained by summarising the three item scores.
- *Student-orientation*: Laurillard's (2002) framework was used to structure an independent variable called student-orientation. The variable covered items measuring discursive, adaptive, interactive and reflective elements.
- *Explorative elements*: The lecturers were asked to assess the usage of explorative, receptive and discursive elements during their course by distributing 100% between

the three types of teaching methods: explorative elements (degree to which the class was characterised by self-study of the participants), receptive elements (degree to which the class was characterised by talks through the lecturer or guest speakers and thus by students listening) and discursive elements (degree to which the class was characterised by discussions involving the participants). The percentage attributed to explorative elements was used for the variable in question.

- *Feedback:* To assess the level and quality of feedback processes within a course, the students were asked to assess the frequency of the provision of feedback (item 1), the qualification of the person who provided the feedback (item 2) and the opportunity to draw on the feedback during the rest of the course (item 3).

Two moderating variables were included in the model:

- *Previous entrepreneurial exposure:* Studies have revealed that the impact of entrepreneurship training on entrepreneurial intention varies according to previous entrepreneurial exposure. Entrepreneurial intention significantly increases when participants have not had any entrepreneurial exposure, whereas the intention remains at the same level or even decreases when the respondents indicate a high level of previous entrepreneurial exposure (Fayolle et al., 2005). Therefore, the students had to answer eight yes-or-no-questions about previous exposure (e.g., are there any entrepreneurs within your family or among your acquaintances?). Afterwards, the questions which were answered positively were summed up.
- *Student expectations:* Learning cannot take place without the will and the participation of the learners. The expectations of the students might therefore influence the impact the courses have on the students. The respondents had to select between four different statements to indicate their expectations. Two statements were coded as 'indifferent/expectant' (e.g., I attended the class without any precise expectations.) and two as 'pro entrepreneurial' (e.g., I am determined to start my own company. In order to do so, I hoped that the class would provide me with some precise advice so that I could progress or get support.).

Age, gender and the field of study were used as control variables.

The hypotheses were tested with the following statistical measures: the validity of Ajzen's model was tested using hierarchical regression analysis (Hypotheses 1 to 3). The hypotheses regarding the influence of course characteristics on attitudes, subjective norms and perceived behavioural control (Hypotheses 4 to 13) were tested by calculating bivariate correlations first. Afterwards, significant correlations were tested with regression analysis to analyse the possible influence of control and moderating variables.

5 Results

5.1 Testing Hypotheses 1 to 3

Hypotheses 1, 2 and 3 describe the influence of attitudes, subjective norms and perceived behavioural control on entrepreneurial intention. The hypotheses were tested for the ex ante and for the ex post data set using hierarchical regression analysis (see Table 1).

Table 1 Multivariate regression for Hypotheses 1 to 3

	<i>Ex ante measurement</i>		<i>Ex post measurement</i>	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 1</i>	<i>Model 2</i>
Dependent variable				
Intention				
Control variables				
Age	0.178***	0.082**	0.233***	0.127***
Gender ¹	−0.081	0.027	−0.071	0.008
Field of study ²	0.129**	−0.040	0.091*	−0.051
Independent variable				
Attitude		0.341***		0.267***
Perceived subjective norms		0.221***		0.396***
Perceived behavioural control		0.376***		0.267***
R-square	0.058***	0.615***	0.074***	0.616***
Adj. R-square	0.051	0.610	0.067	0.611

Notes: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

¹Gender: 1 male, 2 female

²Field of study, dummy variable: 1 social sciences, 0 others

In model 1, only the control variables were entered. Age and the field of study had a significant impact on entrepreneurial intention (ex ante/ex post: age $\beta = 0.178/\beta = 0.233$, $p < 0.01$ in both cases; field of study $\beta = 0.129/0.091$, $p < 0.05$ and $p < 0.1$ respectively). This means that older students and students of social sciences tend to have a higher entrepreneurial intention. Both relationships confirm other studies showing that older students and students of business-related fields of study are more likely to start their own company.

The three independent variables (attitude, subjective norms and perceived behavioural control) were included in model 2. All three variables show a highly significant impact on entrepreneurial intention in the ex ante and ex post measurement (ex ante/ex post: attitude $\beta = 0.341/0.267$, subjective norm $\beta = 0.221/0.396$, perceived behavioural control $\beta = 0.367/0.267$, all significant at $p < 0.01$). Hence, Hypotheses 1, 2 and 3 are supported.

5.2 Testing Hypotheses 4 to 13

Hypotheses 4 to 13 describe the influence of certain course characteristics on the antecedents of entrepreneurial intention. It is important to note that the respective change or delta of the antecedents served as the dependent variables (e.g., delta of attitude = attitude ex post – attitude ex ante). The hypotheses were initially tested using bivariate correlations. Eight out of ten hypotheses were significant at $p < 0.05$ or $p < 0.1$. Two hypotheses, the supposed correlation between role models and change in perceived behavioural control (Hypothesis 7) and the supposed positive correlation between entrepreneurial networks and change in perceived behavioural control (Hypothesis 9) were not significant.

The correlations of the supported hypotheses are significant, but not on a very high level. However, considering that the measurement phase only comprised one term and

considering that we are looking at changes of attitudes, perceived subjective norms and perceived behavioural control which were previously shaped through socialisation and experiences over 24 years on average, the results are quite satisfying. Table 2 provides an overview of the hypotheses and the measured values of Kendall's tau-b.

Table 2 Correlations for Hypotheses 4 to 13

<i>H</i>	<i>Variable 1</i>	<i>Variable 2</i>	<i>Kendall's tau-b</i>	<i>n</i>	<i>Hypothesis confirmed?</i>
4	Practical knowledge	Change in perceived behavioural control (pbc)	0.055**	458	Yes
5	Business planning	Change in pbc	0.053*	461	Yes
6	Role models	Change in attitude	0.107***	402	Yes
7	Role models	Change in pbc	0.035	401	No
8	Entrepreneurial network	Change in subjective norms	0.109***	454	Yes
9	Entrepreneurial network	Change in pbc	0.027	460	No
10	Student-orientation	Change in attitude	0.073**	464	Yes
	10a Adaptive elements	Change in attitude	0.043	464	
	10b Discursive elements	Change in attitude	0.061**	464	
	10c Interactive elements	Change in attitude	0.004	464	
	10d Reflective elements	Change in attitude	0.101***	464	
11	Student-orientation	Change in pbc	0.070**	462	Yes
	11a Adaptive elements	Change in pbc	−0.028	462	
	11b Discursive elements	Change in pbc	0.064**	462	
	11c Interactive elements	Change in pbc	.117***	462	
	11d Reflective elements	Change in pbc	0.039	462	
12	Explorative elements	Change in pbc	0.069**	461	Yes
13	Feedback	Change in pbc	0.090***	352	Yes

Notes: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$ (one-tailed)

The measure of the independent variable student-orientation comprises measures for adaptive, discursive, interactive and reflective elements. To see whether the influence on attitude (Hypothesis 10) and perceived behavioural control (Hypothesis 11) can be attributed to specific aspects of student-orientation, the correlations were additionally measured for all aspects separately [see row 10(a) to 10(d) and 11(a) to 10(d)].

For Hypothesis 10, the results show that the change in attitude can be traced back mainly to reflective course elements, i.e., providing students with the chance to reflect on task goals, act accordingly, receive feedback and relate the feedback to their mental conceptions of the topic ($\beta = 0.101$, $p < 0.01$). This result supports the idea that for changing attitudes it is necessary to mentally reflect and rethink concepts which have been established through earlier experiences.

For Hypothesis 11, the results show that the change in perceived behavioural control is attributed mainly to interactive elements ($\beta = 0.117$, $p < 0.01$). Insights from experiential learning and Bandura's concept of self-efficacy support these findings by saying that active involvement and enactive mastery are required to build a robust belief in one's capabilities to accomplish a certain task.

5.3 The influence of control and moderating variables

In a next step, all course characteristics tested positively in the correlation analysis were also tested in a hierarchical regression analysis in order to test the influence of control variables and possible moderating effects. Table 3 exemplifies the analysis for Hypothesis 6, which is the supposed positive influence of role models on attitude.

Table 3 Hierarchical regression for Hypothesis 6

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Control variables				
Age	0.044	0.046	0.015	0.015
Gender ¹	0.013	0.037	0.066	0.070
Field of study ²	−0.044	−0.105*	−0.116**	−0.122**
Independent variable				
Role models		0.163***	0.122**	0.154
Moderators				
Previous entrepreneurial exposure ³			0.020	−0.079
Student expectations ⁴			0.197***	0.271*
Moderators as terms				
Role models * Previous entrepreneurial exposure				0.172
Role models * Student expectations				−0.179
R-square	0.003	0.030**	0.068***	0.075***
Adj. R-square	−.004	0.020	0.053	0.054

Notes: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

¹Gender: 1 male, 2 female

²Field of study, dummy variable: 1 social sciences, 0 others

³Previous entrepreneurial exposure: 0 no exposure, 1 low exposure, 2 high exposure

⁴Student expectations: 1 indifferent/expectant, 2 pro entrepreneurial

For Hypothesis 6, the regression did not reveal a significant impact of the control variables (model 1). This was also true for the regression analysis run for all other hypotheses except for Hypothesis 8, where the control variable ‘age’ was significant ($\beta = 0.129^{***}$, $p < 0.01$). The impact of the independent variable was analysed in model 2. In the depicted example, the significant influence shown in the correlation analysis was confirmed in the regression analysis ($\beta = 0.163^{***}$, $p < 0.01$). As stated above, hierarchical regressions were run for all hypotheses supported by the bivariate correlations. The significant relationships shown in the correlation analyses were confirmed in the hierarchical regressions for Hypotheses 6, 8, 10, 11 and 13, but not for Hypotheses 4, 5 and 12. The regressions did not reveal a consistent picture of the moderating role of previous entrepreneurial behaviour and student expectations. Even though for five regression analyses, previous entrepreneurial exposure was significant in model 3 with a negative sign, a result which is in line with previous studies showing that the impact of entrepreneurship courses is lower if the participants already had exposure to the topic. A significant positive influence of student expectations was shown for Hypotheses 4, 6, 8, 10 and 12: if the student’s expectations could be classified as ‘pro

entrepreneurial', the influence of the independent variable was higher, thus, the students seemed to be more open to the provided learning offerings.

6 Conclusions and limitations

The results of this study suggest that it is possible to promote entrepreneurial intentions through effectively designed entrepreneurship training. In the following sections, the most salient results and implications of the study are presented.

- We knew that entrepreneurship courses influence entrepreneurial intention; now, we better understand why this is the case. Previous studies showed that entrepreneurial intention can be influenced by entrepreneurship courses, but the role of the course content and the role of teaching methods remained unclear. The results of this study increase our understanding about the relationship between course characteristics and changes in attitudes, perceptions, and intentions. This knowledge is important for entrepreneurship educators, who can design their courses in a more targeted and effective manner.
- As educators, we have multiple possibilities to influence entrepreneurial intention, especially by means of increasing perceived behavioural control. The results revealed that perceived behavioural control can be changed through various course characteristics such as practical experience, business planning activities, interactive elements or integrated feedback processes. Also, two options to influence student attitudes were discovered, namely role models and student-oriented classes with a focus on reflective elements. It seems more difficult to change subjective norms. Probably, changing subjective norms will involve more than merely providing individual courses, but it is necessary that an entrepreneurial spirit is fostered at the university as a whole.
- Teaching methods might be as important as the course content if we want to influence entrepreneurial intention. Since entrepreneurial intention is mainly influenced by attitudes and perceptions, teaching methods which comprise emotions and experiential learning should come to the fore. Upfront teaching can be used when cognitive knowledge needs to be conveyed, but is not sufficient to change intentions.
- If we want to change students' entrepreneurial intention, explorative teaching methods should be a core element of entrepreneurship education. Teaching methods which allow students to explore the subject matter and gain their own experience seem to be imperative if we want to substantially increase students' self-efficacy beliefs. One central element is enactive mastery experience, the experience of successfully mastering a situation.
- Entrepreneurship programmes should not be restricted to entrepreneurship classes, but should follow an integrated approach. If universities want to position themselves as institutions actively promoting entrepreneurship, they must establish programmes linking classroom experience with market experience, student networks with entrepreneurial networks, current students with alumni in business and student entrepreneurs with experienced entrepreneurs who serve as mentors.

- Educators play a central role in the delivery of these programmes. The entrepreneurship educator should take up the role of a facilitator who provides an environment conducive to gaining experiences, reflecting on it and moving further. Entrepreneurship education is not only about teaching and training, but also about personal enablement and about providing an environment where students can discover their own potential. Thus, the lecturer needs to take on the role of a facilitator who takes care that the students can gain relevant experience.

It is hoped that the study has increased the body of knowledge about the relationship between entrepreneurship courses and entrepreneurial intention. However, the study has limitations related to time, quality and methodology:

- The study used an ex ante/ex post approach to measure the change in attitudes, perceptions and intentions with respect to educational variables. But the study did not analyse the stability of these changes over time. Only longitudinal studies could alleviate the research gap in this area.
- Regarding quality, we have to consider that the objective of entrepreneurship education should not be to increase the number of start-ups without looking at quality aspects of the new ventures. Hence, we should improve our understanding of the impact of entrepreneurship education on the quality of start-ups. Do former entrepreneurship students found more successful companies? Can some failures be avoided?
- The correlation analyses and the hierarchical regressions do not show consistent results for all hypotheses. Therefore, further studies based on this dataset should use structural equation modelling since it allows to test and estimate the relationships of the whole conceptual model at the same time.

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Notes

- 1 The article is based on the results of the author's doctoral thesis which was published online:
Mueller, S. (2009) 'Encouraging future entrepreneurs: the effect of entrepreneurship course characteristics on entrepreneurial intention', Doctoral thesis, University of St. Gallen, Online publication, EDIS, available at <http://www1.unisg.ch/www/edis.nsf/wwwDisplayIdentifier/3550>.
The results have not been published in an academic journal.

Appendix

Table A1 Attitude index

<i>Attitude index</i> <i>Cronbach's alpha 0.81 (ex ante) and 0.83 (ex post)</i>	
Items according to Kolvereid (1996)	
A	Reasons for becoming organisationally employed
1	It is important to me to have a secure job. (job security)
2	It is important to me not to work overtime. (work load)
3	I want to avoid taking over responsibility during my work. (avoid responsibility)
B	Reasons for becoming self-employed
4	I want to use market opportunities to have economic success. (use economic opportunities)
5	I want to have an exciting work. (challenge)
6	I want to have a challenging work. (challenge)
7	I want to have freedom during my work. (autonomy)
8	I want to be my own boss. (autonomy)
9	I want to take decisions on my own. (authority)
10	I want to have authority at work. (authority)
11	Self-actualisation is important to me. (self-actualisation)
12	I would like to take part in the whole working process. (participate in the whole process)
Items developed according to Ajzen (2002)	
C	Direct measures: evaluation of performing the behaviour in question
13	Becoming an entrepreneur within the first five years after finishing my studies would be useful for me. (usefulness)
14	Becoming an entrepreneur within the first five years after finishing my studies would advance my career. (advance career)
15	I would enjoy becoming an entrepreneur within the first five years after finishing my studies. (enjoyment)

Notes: The participants were asked to specify for each statement whether they agree or disagree with the statement.

(1 = strongly agree, 5 = strongly disagree)

Source: Items according to Kolvereid (1996)

Table A2 Subjective norm index

<i>Subjective norm index, items developed according to Ajzen (2002)</i> <i>Cronbach's alpha 0.76 (ex ante) 0.80 (ex post) (first three items)</i>	
A	Normative belief strength
1	My family thinks that I will become an entrepreneur. (perceived family expectations)
2	People who are important to me think that I should become an entrepreneur. (perceived expectations of important others)
B	Descriptive item
3	People whose opinion I value have become entrepreneurs within the first five years after finishing their studies. (actual behaviour of important others)
C	Motivation to comply
4	The opinion of my family is very important to me. (motivation to comply with family expectations)
5	The opinion of people who are important to me influences me a lot. (motivation to comply with other people's opinions)

Notes: The participants were asked to specify for each statement whether they agree or disagree with the statement.
(1 = strongly agree, 5 = strongly disagree)

Table A3 Perceived behavioural control index

<i>Perceived behavioural control index, items developed according to Ajzen (2002)</i> <i>Cronbach's Alpha 0.81 (ex ante) and 0.89 (ex post)</i>	
A	Self-efficacy items
1	Starting a company within the first five years after finishing my studies would be very easy for me.
2	I'm sure that I would be successful if I started my own company within the first five years after my study.
3	I have enough self-confidence to start my own business within the first five years after finishing my studies.
4	If I started my own business, I would be more successful than most of my fellow students.
B	Controllability items
1	Whether I will become an entrepreneur within the first five years after finishing my studies lies completely in my own hands.
2	I know enough to start my own business within the first five years after finishing my studies.
3	If I became an entrepreneur, it would be very likely that my company would be successful after two years.

Notes: The participants were asked to specify for each statement whether they agree or disagree with the statement.
(1 = strongly agree, 5 = strongly disagree)

Table A4 Intention index

<i>Intention index, items developed according to Ajzen (2002)</i> <i>Cronbach's Alpha 0.87 (ex ante) and 0.88 (ex post)</i>	
1	I will try to start my own business within the first five years after finishing my studies.
2	I have already taken some steps to start my own business (e.g., gathered information, worked out a business idea with friends, wrote a business plan).
3	I strongly believe that I will start my own business within the first five years after finishing my studies.

Notes: The participants were asked to specify for each statement whether they agree or disagree with the statement.
(1 = strongly agree, 5 = strongly disagree)