

# Entrepreneurship Education: Non-Linearity in the Satisfaction – Continuation Relationship

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In this paper we propose one possible explanation of the inter-relationships between education continuation or avoidance, satisfaction level, and experience (entrepreneurial maturity) of potential and practicing entrepreneurs. By using the cusp catastrophe model we propose that relationship between education satisfaction and continuation tends to be linear for less experienced entrepreneurs (pre-entrepreneurs), whereas for more experienced entrepreneurs the relationship is proposed to be positive but non-linear (s-shaped). Data were collected with a structured questionnaire from 122 participants in management and entrepreneurship education and training programs. The proposed model was tested with linear and non-linear regression equations. The relationship between satisfaction and continuation (loyalty) was found to be positive for all entrepreneurial and non-entrepreneurial groups. The appropriate functional form for the satisfaction-continuation relationship discovered for non-entrepreneurs and people that are only thinking about entrepreneurship (maybe-entrepreneurs) is close to linear and less steep than for more entrepreneurial groups. By contrast, prospective entrepreneurs (people in the process of pre-start up) and practicing entrepreneurs tend to be more sensitive to their education satisfaction in their future education continuation decisions. The appropriate functional form for these entrepreneurial groups tends to be cubical, which is close to the s-shaped function proposed in the cusp model. The study provided evidence that the relationships between entrepreneurial maturity, education satisfaction and education continuation may be modeled as a cusp catastrophe model. The proposed model can be helpful for education and for training providers (and marketers) in explaining and predicting of education loyalty or the switching behavior of entrepreneurs.

*Key words:* entrepreneurship, education satisfaction, non-linearity

## Introduction

Education and learning are important in entrepreneurship and economic development. Practicing and potential entrepreneurs gain new knowledge and skills by engaging in management and entrepreneurship-related education, training and professional development. The need for continuous entrepreneurship education has increased due to the elevated pace of change and globalization of markets. Management and entrepreneurship education providers are trying to satisfy the knowledge-acquisition needs of experienced and future entrepreneurs. Even if research has indicated that entrepreneurial training significantly and positively impacts on participants' perceptions of their abilities to pursue and grow new ventures (Ehrlich et al. 2000), experienced entrepreneurs may be less likely to engage in the entrepreneurship education than potential entrepreneurs. This may be due to post-education experience satisfaction formation differences based on differences in entrepreneurial maturity of entrepreneurs and potential entrepreneurs. In this paper we analyze the effect of satisfaction with education on the entrepreneur's and the pre-entrepreneur's education continuation. We propose and test a model for explaining and predicting education continuation or avoidance of potential and practicing entrepreneurs. Our main objective is to indicate that entrepreneurship education continuation may be contingent, but not necessarily in linear forms, on the entrepreneur's satisfaction with education and his or her entrepreneurial maturity.

## Theory and Hypotheses

### ENTREPRENEURSHIP EDUCATION

'The utility of entrepreneurial knowledge lies in its value for increasing the effectiveness of new ventures as well as small- and medium-sized businesses' (Young 1997, 215). Young (1997) defines: entrepreneurship education as structured, formal conveyance of entrepreneurial knowledge; entrepreneurial knowledge as the concepts, skills, and mentality which individual business owners use during the course of starting and developing their growth-oriented businesses; and entrepreneurial learning as the active and cognitive processes individuals employ as they acquire, retain and use entrepreneurial knowledge. Entrepreneurship education incorporates teachable elements (entrepreneurship education as science) and non-teachable aspects (entrepreneurship education as art) (Miller 1987; Sae 1996; Shepherd and Douglas 1996; Henry,

Hill, and Leitch 2003). Practicing entrepreneurs are motivated to acquire entrepreneurial knowledge in order to solve the novel problems they face in their enterprises. These problems come from different sources: changes in the external or internal environments of a business, or modifications of the entrepreneur's goals (Young 1997). The environments are continuously changing. Entrepreneurs, in order to be able to solve emerging problems, need to learn continuously through self-directed learning, as well as through formal education and training. Entrepreneurs tend to learn through business experience accompanied by trial and error processes (Boussouara and Deakins 1998). While entrepreneurs mostly rely on self-directed learning, pre-entrepreneurs tend to engage in entrepreneurial education and training. Reasons for the apparent avoidance of practicing entrepreneurs of formal education and training might be: 'perceived immediate need for required knowledge, lack of availability of the precise class or workshop that meets their needs, lack of time to engage in a formal learning program, the desire to structure the learning effort as they like, the desire to keep the learning styles they use flexible, the desire to take advantage of their own learning styles' (Young 1997, 225).

Previous experience level of participants can be considered important in entrepreneurship training programs development (Pretorius 2001). Kuratko (2005) distinguished experienced entrepreneurs from other people in entrepreneurship education, such as students, and claimed that students need more exposure to experienced entrepreneurs, their stories and problem handling in the real entrepreneurial world. Acquisition of practical skills through real world experiences is a crucial element in co-operative education (Garavan and Murphy 2001) and entrepreneurship education (Heinonen and Poikkijoki 2006). Requirements for necessary skills and knowledge may differ by the type of entrepreneur (Block and Stumpf 1992). Past experience and experience in education programs can impact entrepreneurial intentions (Peterman and Kennedy 2003). Small business owners can be interested in development of skills and in training, if these new learning opportunities can be applicable to the current situation in their business (Walker et al. 2007). Learning needs of entrepreneurs may be different at different stages of development such as: pre-startup and post-startup (Gorman, Hanlon, and King 1997) or awareness, pre-startup, startup, growth, and maturity (McMullan and Long 1987; O'Gorman and Cunningham 1997; Bridge, O'Niell, and Cromie 1998; Henry, Hill, and Leitch 2003). Variables related to learning that characterize prac-

ting entrepreneurs (distinguishing them from pre-entrepreneurs) were identified by Young (1997); accordingly, variables that characterize the practicing entrepreneur are as follows:

- self concept (a mature self concept, entrepreneur knows who he or she is, with clear personal goals and aspirations);
- experience (brings to the learning situation an accumulated reservoir of business and life experiences which become an increasing resource for learning);
- readiness (has a readiness to learn directly, related to his or her role and responsibilities as a lead entrepreneur);
- application (is more problem-centered, concerned with the immediate application of knowledge).

Taking into consideration these characteristics, entrepreneurs could have a high level of involvement related to their learning. However, they are not likely to engage in entrepreneurial education and training after pre-start-up phase and after start-up phase, where their involvement and transaction costs could also be at high level. In other words, they seem to switch from education and training to self-directed learning. As they become more mature (more experienced) they tend to switch more. Another important question is, however, why entrepreneurs switch under high levels of involvement and transaction costs. A possible explanation might be found by using a concept of satisfaction, developed in the consumer research field. Entrepreneurs are consumers of entrepreneurial education and training, that is, 'a service'.

#### SATISFACTION AND SERVICE LOYALTY

Overall satisfaction is defined as an emotional reaction to a product or service experience (Spreng, MacKenzie, and Olshavsky 1996). Oliva, Oliver, and MacMillan (1992) tried to explain why investments in a service fail. In their study they supported the predictions that the satisfaction-loyalty relationship could be linear and non-linear, depending on the customer involvement. Involvement creates commitment to the situation, as suggested by Beatty, Kahle, and Homer (1988, 149) for brands: 'ego involvement influences purchase involvement, which influences brand commitment.' Oliva, Oliver, and MacMillan (1992) used customer-transaction costs (that is, how heavily the buyer is invested in the service components of transaction) as 'an approximation for involvement and commitment.' They proposed that, when customer-transaction costs are low

the satisfaction-loyalty relationship is linear and when customer-transaction costs are high the satisfaction-loyalty relationship is non-linear. They tested relationships between independent variables (customer-satisfaction costs, satisfaction level) and dependent variable (loyalty or avoidance level) by using the cusp catastrophe model. Catastrophe theory and chaos theory approaches have been applied, among others, in economics, psychology, management, and marketing. Catastrophe models have been used, for example, in determining adoption or rejection of an innovation (Herbig 1991), in explaining academic performance (Guastello 1987), in examining the outcomes of employee withdrawal (Sheridan 1985), and in developing service satisfaction strategies (Oliva, Oliver, and MacMillan 1992).

ENTREPRENEURSHIP EDUCATION AVOIDANCE, SATISFACTION LEVEL, AND MATURITY

In the section on entrepreneurship education we argued that individuals oriented toward entrepreneurship might have a high level of involvement related to entrepreneurship education. However, the relation between high involvement and education avoidance/continuation is rather unexplained. It seems that at the high level of involvement, entrepreneurship oriented individuals might continue education or avoid it depending on their (1) maturity (experience) as suggested in the section on entrepreneurship education, and (2) satisfaction with previous education that might be viewed as service (see the section above). Nevertheless, the interrelationships between education avoidance, satisfaction level, and maturity could probably not be explained using a linear model, while the avoidance-satisfaction relation could be linear or non-linear as suggested by Oliva, Oliver, and MacMillan (1992). The cusp catastrophe model is partially non-linear and may be an appropriate model for approximating relationships between education continuation, satisfaction, and entrepreneurial maturity.

MODEL OF EDUCATION CONTINUATION

Potential entrepreneurs tend to be less focused than are the more mature, practicing entrepreneurs. Therefore, they would be more likely to continue their education on the basis of satisfaction with the prior education – relationship between satisfaction level and continuation might be linear (that is, the higher the satisfaction level, the higher the likelihood of education continuation). Mature entrepreneurs, on the other hand, seem to be more selective and more



FIGURE 1 Education continuation model

likely to avoid education than potential entrepreneurs at a similar level of satisfaction. Relationship between satisfaction level and avoidance/continuation might be s-shaped (that is, at a certain satisfaction level there would be a leap in the likelihood of education continuation). The proposed interrelationship between education continuing/avoidance level, satisfaction level, and maturity level is presented in figure 1. Key hypotheses of the underlying model are:

**HYPOTHESIS 1** *The relationship between the satisfaction level and the education continuation (loyalty) level will be positive and linear for potential entrepreneurs.*

**HYPOTHESIS 2** *The relationship between the satisfaction level and the education continuation (loyalty) level will be positive but non-linear (in form of an s-shape) for practicing entrepreneurs.*

## Methods

In this section, the methodology (variables and measurement, sample and data collection, and analysis) that was used to test the proposed model is presented.

### VARIABLES AND MEASUREMENT

Independent variables are entrepreneurial maturity and satisfaction with education. First, maturity was measured as entrepreneurship experience, that is, 'number of years practicing entrepreneurship (having own business)' for practicing entrepreneurs and 'number of

years to the first new venture start-up' for pre-entrepreneurs. Respondents were asked for how long they had been running their own enterprise. A scale with twelve categories was used: ten categories ranging from 'more than 30 years' to 'I do not have my own firm yet but plan to start it in two to three years', and two categories for identifying two less entrepreneurship oriented groups (maybe-entrepreneurs: those who are maybe going to start their own enterprise in the future; non-entrepreneurs: those who have no intention to start their own enterprise).

Second, satisfaction level was not assumed to be uni-dimensional as proposed by Westbrook (1980), who used only a single five-point delighted-terrible scale. In a pre-study we discovered that measuring satisfaction with education on a single six-point scale ranging from 'very satisfied' to 'very unsatisfied' results in a very skewed answer distribution, which may not be usable for analysis with continuous variables. Therefore, satisfaction was measured with eight items on seven-point semantic differential scales answering a question about the respondent's general feeling about the education they engaged in (anchors: very dissatisfied-very satisfied, terrible-delighted, very dissatisfied-not at all dissatisfied, not at all satisfied-very satisfied, unfavorable-favorable, unpleasant-pleasant, I didn't like it at all-I like it very much, frustrated-contented). Items were adapted from Crosby and Stephens (1987), Eroglu and Machleit (1990), and Spreng, MacKenzie, and Olshavsky (1996).

The dependent variable – education continuation – was measured as the respondent's intention to continue his or her education in the future in terms of expressed loyalty to the educational program and provider. Five questions were adapted from Bettencourt (1997), and Zeithaml, Berry, and Parasuraman (1996): (1) saying positive things, (2) recommend to people who are thinking about education, (3) encourage friends and relatives to engage in this education, (4) consider this education provider as a first choice, and (5) engage more in education from this provider in the next years. A seven-point Likert-type scale was used with anchors from 'strongly disagree' to 'strongly agree'.

Control variable data were collected about the respondent's education type (degree, non-degree), age, gender, length of work experience, education level, and industry.

#### DATA COLLECTION AND SAMPLE

The data were collected from Slovenian practicing and potential entrepreneurs, as well as non-entrepreneurs, who were engaged in de-

TABLE 1 Sample composition

|  |       |
|--|-------|
| <i>Sample size (no. of respondents)</i>      | 122   |
| <i>Entrepreneurial maturity (experience)</i> |       |
| Practicing-entrepreneur                      | 17.2% |
| Prospective-entrepreneur                     | 18.9% |
| Maybe-entrepreneur                           | 49.2% |
| Non-entrepreneur                             | 14.8% |
| <i>Education type</i>                        |       |
| Degree                                       | 58.6% |
| Non-degree                                   | 41.4% |
| <i>Age</i>                                   |       |
| 30 years or less                             | 60.6% |
| Over 30 years                                | 39.4% |
| <i>Gender</i>                                |       |
| Female                                       | 56.8% |
| Male   | 43.2% |
| <i>Prior education level</i>                 |       |
| Vocational/secondary/high school             | 65.9% |
| College/university                           | 34.1% |
| <i>Work experience</i>                       |       |
| 10 years or less                             | 62.8% |
| Over 10 years                                | 37.2% |
| <i>Main industries</i>                       |       |
| Consumer and business services               | 36.8% |
| Manufacturing                                | 22.1% |
| Trade  | 10.3% |
| Banking/investment/insurance                 | 10.3% |
| Construction                                 | 8.8%  |
| Transportation/public utilities              | 7.4%  |

gree and non-degree management education and training. A structured questionnaire was administered mainly via classroom distribution to eight conveniently selected groups of participants. Answers were received from 128 management and entrepreneurship education participants; 122 responded to the entrepreneurial maturity question – these responses were used for the analysis.

Characteristics of the sample are summarized in table 1. The sample consists of 17.2% practicing entrepreneurs, 68.1% potential entrepreneurs (18.9% prospective and 49.2% maybe-entrepreneurs), and 14.8% non-entrepreneurs.

The sample includes 58.6% participants, who are being educated at

the degree education type (high school, college and university level) and 41.4% participants, who have engaged in the non-degree education type (mainly workshops and seminars). The sample education participants tend to be younger (60.6% of age 30 or less vs. 39.4% older). The sample was well balanced in terms of gender (56.8% female), included a good proportion of participants with completed college or university degree (34.1%) and work experience of over 10 years (37.2%), and also entrepreneurs from different industries (for example consumer and business services, manufacturing, trade, financial services, construction).

#### ANALYSIS

Multi-item scales of satisfaction and education continuation (loyalty) were checked for their convergent validity by using the Cronbach Alpha reliability measure. For these two constructs a single item was computed as the mean of all construct items. This was undertaken in order to reduce the number of variables for subsequent analysis. Hypotheses were tested by using regression analyses with groups of entrepreneur-type data. The sample was split into four groups on the basis of the entrepreneurial maturity (experience) variable. The relationship between satisfaction and education continuation (loyalty) was estimated for the practicing-entrepreneur group, two groups of potential entrepreneurs (prospective- and maybe-entrepreneurs), and a group of non-entrepreneurs.

Linearity in the relationship was assessed by conducting regression analyses in linear and non-linear forms. Linear, quadratic and cubic analyses used the following general function type:

$$y = f(x) = b_0 + b_1x + b_2x^2 + b_3x^3, \quad (1)$$

where  $y$  is the dependent variable (continuation),  $x$  is the independent variable (satisfaction),  $b_0$  is the intercept, and  $b_1$ ,  $b_2$ , and  $b_3$  are coefficients ( $b_1$  estimated in linear equation,  $b_1$  and  $b_2$  in quadratic, and  $b_1$ ,  $b_2$ , and  $b_3$  in cubic).

In order to test the discontinuity in the satisfaction – continuation relationship for the group of practicing entrepreneurs a special exponential independent variable form was introduced in a linear equation resulting in the following function form:

$$y = f(X) = f\left(\frac{1}{1 + \exp(-A \cdot (x - B))}\right) = b_0 + b_1X, \quad (2)$$

where  $X = 1/(1 + \exp(-A \cdot (x - B)))$ ,  $y$  is the dependent variable (continuation),  $x$  is the independent variable (satisfaction),  $b_0$  is the in-

tercept,  $b_1$  is the coefficient, and  $A$  and  $B$  are coefficients in the exponential equation.

The exponential equation ( $1/(1 + \exp(-A \cdot (x - B)))$ ) has been used in item response theory (a good overview of item response theory was provided by Reise, Widaman, and Pugh 1993 and Singh 1996), which is used for estimating the appropriateness of measurement items and has the ability to account for the nonlinear form of measurement items. The coefficients of the exponential equation determine slope ( $A$ ) and position ( $B$ ) of the discontinuity. We decided to use this equation form, not in its original use (testing measurement items) but in testing the relationship between variables, because the equation may well represent the proposed discontinuous relationship between satisfaction and continuation in the cusp model.

Influences of control variables (education type, age, gender, work experience, education level, and industry) were assessed by splitting the data across each of these groups and comparing estimation results across the pairs of control groups.

## Findings

Findings are presented in terms of hypotheses testing, model-related findings and findings related to the role of control variables.

### HYPOTHESES TESTING AND MODEL-RELATED FINDINGS

The two key hypotheses of the proposed model differentiate the form of the general positive satisfaction – continuation relationship on the basis of entrepreneurial maturity (experience). Findings of regression analyses and best function forms for the three groups of entrepreneurs and a group of non-entrepreneurs are shown in figure 2 and table 2.

Hypothesis 1 stated that the relationship between the satisfaction level and education continuation would be positive and linear for potential entrepreneurs. The relationship was estimated for prospective entrepreneurs (those who do not have their own enterprise but plan to start it at the latest in forthcoming three years) and maybe-entrepreneurs (those who do not have their enterprise but may start it sometime in the future). The regression coefficient of the linear equation was found positive and significant for both prospective (0.64) and maybe-entrepreneurs (0.66). When non-linear equations were estimated, we found that a cubic functional form could be more appropriate for prospective entrepreneurs ( $R$ -squared 0.73 vs. 0.38 of the linear equation).

As we can see in figure 2, also the cubic function indicates a positive relationship between education satisfaction and continuation (loyalty). For maybe-entrepreneurs a cubic form may be also used, but its proportion of variance explained is similar to the linear form ( $R$ -squared: linear 0.30, quadratic 0.31). These results are in support of the hypothesized positive relationship in hypothesis 1. Support for the proposed linearity is mixed; this was found for maybe-entrepreneurs but was not supported for prospective entrepreneurs.

Hypothesis 2 stated that the relationship between the satisfaction level and education continuation (loyalty) would be positive but non-linear (in form similar to an s-shape) for practicing entrepreneurs. The linear function regression coefficient was found high, positive and significant (1.05). Hence, strong evidence was found for the existence of a positive relationship between satisfaction level and education continuation for practicing entrepreneurs. The second part of hypothesis 2 (non-linear form) was also tested. Results for cubic function and the special case of exponential function in table 2 indicate that these two functions may slightly better fit the data in terms of the variance explained ( $R$ -squared: cubic 0.87 and exponential 0.86 vs. linear 0.83). Since the linear function fitted the data well, we found some – but limited – support for the second part (non-linearity) of hypothesis 2.

In addition to entrepreneurs (practicing and potential) we tested the satisfaction – continuation relationship also for a group of non-entrepreneurs. A positive relationship was found also for this group, however the regression coefficient (0.57) was somewhat lower and the intercept (2.28) somewhat higher than in linear equations for

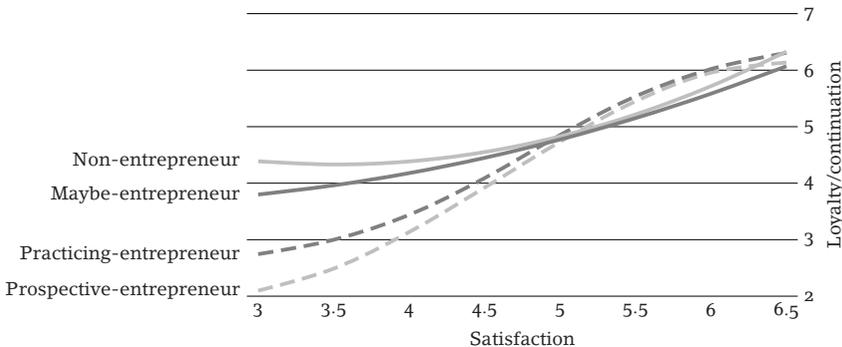


FIGURE 2 Education continuation, maturity and satisfaction level

TABLE 2 Function estimates for entrepreneurial and non-entrepreneurial groups

| Group/function                          | Coefficients* |       |       |       | $R^2$ |
|---|---------------|-------|-------|-------|-------|
|   | $b_0$         | $b_1$ | $b_2$ | $b_3$ |       |
| Continuation = $f(\text{satisfaction})$ |               |       |       |       |       |
| <i>Practicing-entrepreneurs</i>         |               |       |       |       |       |
| Linear                                  | -0.49         | 1.05  |       |       | 0.83  |
| Non-linear (cubic)                      | 9.69          | -6.30 | 1.67  | -0.12 | 0.87  |
| Non-linear**                            | 2.48          | 4.12  |       |       | 0.86  |
| <i>Prospective-entrepreneurs</i>        |               |       |       |       |       |
| Linear                                  | 1.56          | 0.64  |       |       | 0.38  |
| Non-linear (cubic)                      | 1.72          | -8.26 | 2.15  | -0.16 | 0.73  |
| <i>Maybe-entrepreneurs</i>              |               |       |       |       |       |
| Linear                                  | 1.58          | 0.66  |       |       | 0.30  |
| Non-linear (quadratic)                  | 3.96          | -0.38 | 0.11  |       | 0.31  |
| <i>Non-entrepreneurs</i>                |               |       |       |       |       |
| Linear                                  | 2.28          | 0.57  |       |       | 0.52  |
| Non-linear (quadratic)                  | 7.07          | -1.56 | 0.22  |       | 0.65  |

NOTES \* Un-standardized coefficients of the function  $y = f(x) = b_0 + b_1x + b_2x^2 + b_3x^3$ ; all coefficients significant at 0.05. \*\* Function in the form  $y = f(1/(1 + \exp(-1.5(x - 4.8))))$ .

entrepreneurial groups. Estimation of non-linear functions showed that a cubic functional form may be more appropriate for this group ( $R$ -squared 0.65). These findings indicate – as can be seen in figure 2 – that satisfaction tends to impact continuation, but that non-entrepreneurs tend to be less selective than entrepreneurs and entrepreneurs-to-be, or else are more willing to continue education with less regard to the satisfaction level than entrepreneurial groups. Figure 2 indicates that the satisfaction – continuation function for non-entrepreneurs tends to be similar to the function for maybe-entrepreneurs, but different than the functions of more entrepreneurial types. The function for prospective and practicing entrepreneurs tends to be steeper and more of a non-linear cusp form than the functions for non-entrepreneurs and maybe-entrepreneurs. These results are in some support of the proposed cusp model of education continuation.

#### ROLE OF CONTROL VARIABLES

Function estimations across control variables (education type, gender, prior education level, age, work experience, and industry) are presented in table 3. The proposed positive relationship between satisfaction and continuation (loyalty) was found across all control groups. The variances explained indicate that the cubic functional

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TABLE 3 Impact of control variables\*

| Group                            | Linear function** |        |                | (1)            | (2)            |
|----------------------------------|-------------------|--------|----------------|----------------|----------------|
|                                  | Intercept         | Coeff. | R <sup>2</sup> | R <sup>2</sup> | R <sup>2</sup> |
| <i>Sample</i>                    | 1.40              | 0.70   | 0.42           | 0.46           | 0.48           |
| <i>Education type</i>            |                   |        |                |                |                |
| Degree                           | 0.58              | 0.84   | 0.50           | 0.50           | 0.50           |
| Non-degree                       | 2.62              | 0.50   | 0.32           | 0.48           | 0.51           |
| <i>Gender</i>                    |                   |        |                |                |                |
| Female                           | 1.68              | 0.64   | 0.35           | 0.38           | 0.39           |
| Male                             | -0.37             | 1.02   | 0.74           | 0.77           | 0.78           |
| <i>Prior education level</i>     |                   |        |                |                |                |
| Vocational/secondary/high school | 2.27              | 0.55   | 0.25           | 0.37           | 0.38           |
| College/university               | 0.27              | 0.90   | 0.72           | 0.72           | 0.72           |
| <i>Age</i>                       |                   |        |                |                |                |
| 30 years or less                 | 0.57              | 0.84   | 0.48           | 0.48           | 0.48           |
| Over 30 years                    | 2.40              | 0.56   | 0.39           | 0.51           | 0.56           |
| <i>Work experience</i>           |                   |        |                |                |                |
| 10 years or less                 | 0.38              | 0.86   | 0.51           | 0.51           | 0.51           |
| Over 10 years                    | 2.80              | 0.48   | 0.33           | 0.46           | 0.51           |
| <i>Industry</i>                  |                   |        |                |                |                |
| Services                         | 2.05              | 0.59   | 0.33           | 0.49           | 0.57           |
| Other***                         | 1.05              | 0.77   | 0.53           | 0.53           | 0.53           |

NOTES Column headings are as follows: (1) quadratic function; (2) cubic function.  
 \* Dependent variable (y) = continuation, independent variable (x) = satisfaction.  
 \*\* Un-standardized coefficients of the function  $y = f(x) = b_0 + b_1x$  displayed; all coefficients significant at 0.05; differences in regression coefficients in italics. \*\*\* Manufacturing, construction, and transportation/public utilities.

form may be in most of these cases at least equal or even superior to the linear form. Differences in regression coefficients indicate that some control groups may be somewhat more sensitive to satisfaction levels than other groups. These groups are: respondents involved in for-degree education, males, younger participants, participants with shorter working experience (10 years or less), and participants from non-service industries.

It must also be noted that some control variable characteristics may be related to entrepreneurial maturity group membership. For example, the sample of practicing entrepreneurs is predominantly male, and prevalently college or university educated; these individuals are over 30 years old, with over 10 years' working experience. Characteristics of entrepreneurial and non-entrepreneurial groups are shown in table 4.

TABLE 4 Control variables by entrepreneurial and non-entrepreneurial groups\*

| Group                            | (1)   | (2)   | (3)   | (4)   |
|----------------------------------|-------|-------|-------|-------|
| <i>Education type</i>            |       |       |       |       |
| Degree                           | 33.3% | 71.7% | 65.2% | 47.6% |
| Non-degree                       | 66.7% | 28.3% | 34.8% | 52.4% |
| <i>Gender</i>                    |       |       |       |       |
| Female                           | 88.8% | 70.0% | 38.1% | 9.5%  |
| Male                             | 11.1% | 30.0% | 61.9% | 90.5% |
| <i>Prior education level</i>     |       |       |       |       |
| Vocational/secondary/high school | 72.2% | 78.3% | 69.6% | 23.8% |
| College/university               | 27.8% | 21.7% | 30.4% | 76.2% |
| <i>Age</i>                       |       |       |       |       |
| 30 years or less                 | 33.3% | 81.7% | 60.9% | 28.6% |
| Over 30 years                    | 66.7% | 18.3% | 39.1% | 71.4% |
| <i>Work experience</i>           |       |       |       |       |
| 10 years or less                 | 33.3% | 83.6% | 65.2% | 33.3% |
| Over 10 years                    | 66.7% | 16.4% | 34.8% | 66.7% |
| <i>Industry</i>                  |       |       |       |       |
| Services                         | 22.2% | 91.7% | 56.3% | 50.0% |
| Other**                          | 77.8% | 8.3%  | 43.8% | 50.0% |

NOTES Table columns are as follows: (1) non-entrepreneur; (2) maybe-entrepreneur; (3) prospective-entrepreneur; (4) practicing-entrepreneur. \* All Chi-square differences significant. \*\* Manufacturing, construction, and transportation/public utilities.

## Discussion and Conclusion

In this section key findings, implications, limitations and future research opportunities are discussed and conclusions are drawn.

### DISCUSSION OF KEY FINDINGS AND IMPLICATIONS

In this study we proposed a cusp catastrophe model that incorporates the entrepreneurial education continuation surface; the surface's form was proposed to be dependent on the levels of entrepreneurial maturity and education satisfaction. The proposed model suggests that prospective entrepreneurs would be more likely to continue their education on the basis of satisfaction with the prior education – relationship between satisfaction level and continuation might be linear (that is, the higher the satisfaction level, the higher the likelihood of education continuation). Mature entrepreneurs, on the other hand, seem to be more selective and more likely to avoid education than prospective entrepreneurs at a similar level of satisfaction. Relationship between satisfaction level and continuation

might be s-shaped (that is, at a certain satisfaction level there would be a leap in the likelihood of education continuation).

In support for the proposed model we found some differences between practicing and potential entrepreneurs in the education satisfaction – continuation relationship, and some non-linearity as predicted in the cusp model. The relationship between the satisfaction level and education continuation was found to be positive for all entrepreneurial and non-entrepreneurial groups. The appropriate functional form for the satisfaction – continuation relationship discovered for non-entrepreneurs and people that are only thinking about entrepreneurship (maybe-entrepreneurs) is close to linear and less steep than for more entrepreneurial groups. In contrast, prospective and practicing entrepreneurs (people in the process of pre-start up and after start-up) tend to be more sensitive to their educational satisfaction in their future education continuation or to switching behavior. The appropriate functional form for these entrepreneurial groups tends to be cubical, which is close to the S-shaped function proposed in the cusp model. Despite the fact that we did not demonstrate full support for our hypotheses, we are confident that our study has evidenced that the relationships between entrepreneurial maturity, education satisfaction and education continuation may be modeled as a cusp catastrophe model.

The modeling of the entrepreneurial maturity – satisfaction – continuation relationship with the use of non-linearity is a key contribution of this study. Non-linear relationships may be more appropriate than linear ones in assessing the impact of satisfaction with previous education on education continuation (or loyalty). Management and entrepreneurship education and training providers must be aware that experienced entrepreneurs and entrepreneurs in the pre-start-up phase may be very susceptible and sensitive to the relevance of the content and to the perceptions of appropriateness of knowledge dissemination and the learning process. When participants with different entrepreneurship experience are involved in education or the training process, the provider must take special care in satisfying the needs of highly experienced entrepreneurs in order to increase their loyalty and assure their education and training continuation.

#### LIMITATIONS AND FUTURE RESEARCH OPPORTUNITIES

In our research we came across some problems. In Slovenia we can speak about freer enterprise only for the last decade or so – most entrepreneurs started their own firms in this period. In our

sample, the largest number of participants have had their thoughts about their own business or have been in the pre-start-up phase, so that we cannot make conclusions about practicing entrepreneurs with a long experience. In addition, due to lack of control data, our sample may not be highly representative of management and entrepreneurship education participants in Slovenia. Thus, one challenge for future research in Slovenia and other economies that have gone through the transition to a more market-oriented economy is to assess education related cognitions and behaviors of highly experienced entrepreneurs by using more representative samples. Indeed, research into a mature group of entrepreneurs has the potential to indicate even more precisely the proposed non-linear relationships between education satisfaction and continuation for this group of entrepreneurs.

One limitation of our study is the moderate sample size (122 respondents). With this number we came to some interesting findings, but could not make full estimations in analyses when more than two variables should be used (for example control variables across all the entrepreneurial maturity groups). Thus, in future research larger samples shall be preferred in order to make the fullest possible use of control variables.

#### CONCLUSION

Education is very important in various spheres of life. The environments are continuously changing, so entrepreneurs – in order to be able to solve emerging problems – need to learn continuously through self-directed learning, as well as through formal education and training. Entrepreneurs can be classified into two groups: the more experienced (practicing entrepreneurs) and the less experienced (potential entrepreneurs). More experienced entrepreneurs mostly rely on self-directed learning, in comparison to pre-entrepreneurs that engage in entrepreneurial education and training. Practicing entrepreneurs seem to switch from education and training to self-directed learning. As they become more mature (more experienced) they tend to switch more. A possible explanation for this phenomenon might be found by using a concept of satisfaction, developed in the consumer research field; entrepreneurs are actually consumers of entrepreneurial education and training.

In this paper we proposed one possible explanation of the interrelationships between formal education and training continuation or avoidance, satisfaction level, and maturity of potential and practicing entrepreneurs. By using the cusp catastrophe model, which has

been applied in economics, psychology, management, and marketing, we propose that the relationship between satisfaction level and continuation level of entrepreneurship education tends to be linear for less experienced pre-entrepreneurs, whereas for more experienced entrepreneurs the relationship is proposed to be non-linear (that is, s-shaped). Since we found some support for it, we are convinced that the proposed model can be helpful for education and training providers (and marketers) in explaining and predicting education loyalty or the switching behavior of entrepreneurs.

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