MEASURING IMPACT OF AN MBA PROGRAM ON STUDENT ENTREPRENEURIAL ORIENTATION

Siva Sankaran, Department of Systems and Operations Management, California State University, 18111 Nordhoff Street, Northridge, CA 91330, 818-677-2412, siva.sankaran@csun.edu
Tung Bui, Department of Information Technology Management, University of Hawaii at Manoa, 2404 Maile Way, Honolulu, HI 96822, 808-956-5565, tungb@hawaii.edu

ABSTRACT

A methodology to measure student gains in Entrepreneurship Orientation (EO) in an MBA program is presented. Eight variables capturing traits of Entrepreneurship Orientation were identified. A survey instrument was used to measure the variables in a quasi pre-post setting. A cohort of 25 MBA students who were in the final/penultimate semester participated in the study. Factor analysis using principal components extraction and varimax rotation detected three underlying components: *innovation, proactiveness,* and *risk-taking*. The three components accounted for 74% of the variability. The t-Test showed an overall gain of 5.39 in the entrepreneurship orientation scale with p=0.008.

INTRODUCTION

With the offshoring of many manufacturing jobs combined with the growth of automation in many service sectors, the traditional worker demand is on the decline. Today, many graduates upon receiving their degrees can no longer look forward to entering the job market with any guarantee. As a result, they are increasingly turning to discover a niche in the economy where they can start their own ventures. Having recognized the seismic change that is taking place, many degree granting institutions are seeking to rekindle the spirit of entrepreneurship initiated by the Peter Drukcer's seminal work in the 1990's, and have revisited their MBA curriculum to include entrepreneurial education. But inculcating one to become an entrepreneur is easier said than done. It is a challenging task involving not only transferring standard inter-disciplinary skills but also a rewiring of the student's embedded entrepreneurial traits such as creativity, competitiveness and the willingness to take risk. It is in this context that the term Entrepreneurial Orientation (EO) has risen to our attention. The purpose of this paper is to test the result of such curriculum efforts with an empirical study using a differential(Δ) approach.

BACKGROUND

Entrepreneurial Orientation (EO) is part of a cognitive chain in a human mind. The individual links in the chain are: i) Opportunity identification [8], ii) Entrepreneurial Orientation [7], iii) Self-efficacy [2], iv) Intention [6], and v) Performance [10]. In this research, our focus is limited to EO as it has been widely promoted by many business schools as one of the key educational objectives of their curricula. There are five sub-dimensions to EO. These are innovation, proactiveness, risk-taking, adaptability and intention. Kreiser [7] assessed the psychometric properties of EO in a multi-country study to validate EO as a construct based on three dimensions: Risk-taking, proactiveness, and innovation. He used factor analysis tools to explore the fit of data gathered from 1,067 firms in six countries to 1, 2, and 3-factor model solutions. The best model fit was achieved with the 3-factor solution with all path coefficients being at the .001 level of significance. The three sub-dimensions also exhibited a very low correlation with one another using the total sample, with no two dimensions possessing a correlation of higher than 0.50. While no

reliability statistics was reported, Kreiser's final conclusion based on his vast research was that the latent EO construct is a valid measure of the EO concept.

For a firm, *innovation* can be defined as the commercialization of a new product/service or the introduction of a product/service into a new market. Innovation is found to be positively related to EO. It varies positively with risk-taking and negatively with environmental dynamism [1]. Innovation involves major corporate risks, but for strategic purposes, it provides a major contribution to firm growth [4]. *Proactiveness* can be defined as aggressive behavior taken toward rival firms and/or the pursuit of profit opportunities [11]. Proactive firms can utilize first-mover strategies to achieve competitive advantage [8]. Academic studies have shown that rapid firm growth and profitability are associated with proactiveness [5,12]. Being proactive contributes to higher EO [9]. Merriam-Webster dictionary defines *risk-taking* as the act or fact of doing something that involves danger or risk in order to achieve a goal. Higher risk-taking at the firm level generally enhances performance. Risk-taking is generally higher for individuals with an entrepreneurial orientation although the relationship may be curvilinear [3].

The purpose of this paper is to measure the EO of a sample of MBA students at the beginning and penultimate semesters of an MBA program. In doing so, we developed a survey that includes statements relating to the level of i) innovation, ii) proactiveness, and iii) risk-taking the participants may possess.

RESEARCH METHODOLOGY

Quasi pre-post

Quasi studies have both advantages and limitations. Advantages include, i) feasibility when there are time and logistical constraints, ii) less resources to conduct the study, iii) general trends can still be identified from the results, and iv) when carefully designed and executed, validity of results can be preserved [13]. In this study, the researchers carefully explained the setting to the participants and the importance of visualizing the pre-post timelines in an objective manner while filling in the survey. As it turned out, 12% of the ΔEO scores had negative values confirming that participants were candid in their responses. They indicate that the scores measured were not prejudiced by the extent of erroneous improved expectations.

Survey Instrument

Based on the literature review summarized earlier, we created a survey instrument with *eight* variables.

Variable name	Description
Rcm_Prdct_Yes	History of introduced new products/services
Chng_Sig	Impact of the introduced products/services
Prsn_Invn_Bold	Conviction that bold risky decisions are necessary
Intro_Frst	Achieving introduction of new products first into the market
Prsn_Hgrsk	Personal penchant for risk
Adpt_Cmpt	Ability to adapt/respond to competitors' actions
Fvr_RD	Decision-maker's inclination to emphasize R&D
Cmptn_Inate	Focus on initiating competition

Table 1
Surveyed variables

Each variable in the survey instrument was described by a statement. For example, for the variable, Fvr_RD, the statement was, "In general, I personally favor a strong emphasis on R&D, technological leadership and innovation". Each participant rated these variables on a scale of 0 to 5 twice, one as if at the start of the MBA program, and the other at the time close to graduation. Since both the pre and post ratings were collected at a single point in time, we refer to this research design as a quasi pre-post study. The difference in the ratings were used to calculate the net EO gain/loss (ΔEO) as described later.

Sample

The participants in the study were graduate students in an evening MBA program at a large state university located in the southwestern U.S. The program is AACSB-accredited and requires that all students have a minimum of two years of employment experience before admission. The program has also an elective option in entrepreneurship. There were 25 participants in the study who were in their final/penultimate semester of graduation.

Hypotheses

The following hypotheses with respect to the Entrepreneurial Orientation (EO) were tested:

H_0 : There is no net EO gain/loss from the MBA program (ΔEO $= 0$).

H_1 : There is a net EO gain/loss from the MBA program (ΔEO $\neq 0$)

Statistical procedures

This consisted of two statistical procedures in the following sequence: i) Factor analysis and ii) paired T-test. Factor analysis is relevant for our study because it helps to reduce the eight variables discussed earlier by extracting the components in the descending order of variance accountability. Since the Rotated Component Matrix contains weights for each of the eight questions, we can calculate the ΔEO's for each survey participant by multiplying the ratings collected from the survey with principal component weights. The T-test helps to see if there is or not any significant difference from zero in the mean ΔEO scores before and after going through the MBA program.

RESULTS

Factor Analysis

Factor analysis was performed on the ratings expected at end of graduation which was for most students the current semester or the following semester for others. The KMO score was 0.547 that exceeded the criteria of 0.5. Also, the Bartlett's test rejects the null hypothesis that the correlation matrix was an identity matrix due to the high Chi-Square value of 67.711 and $p=0$. This confirms that our data meet the requirements to produce satisfactory factor analysis results. Except for the variable Adpt_Cmpt, all other communality values explained a high proportion of variance. Three components had Eigen values above one and cumulatively explained 73.8% of the variance. The Scree plot also confirmed the above finding that the first three components explain the most variance. Their Cronbach's alphas were above 0.7. So we will consider only these three components in further analysis.

Table 2 shows the three extracted components and their relative loadings by variable. The loadings can be interpreted in two equivalent ways: i) as correlations between the variables and each component, or ii) as

weights assigned to each variable by the components. We will be using the latter interpretation in the computation of ΔEO scores in a subsequent section of this paper.

Rotated Component Matrix[a]

	Component 1	Component 2	Component 3
Rcm_Prdct_Yes	.797	.340	-.004
Chng_Sig	.795	-.145	-.128
Prsn_Invn_Bold	.715	-.124	.526
Intro_Frst	.014	.893	.163
Prsn_Hgrsk	-.396	.823	-.076
Adpt_Cmpt	.353	.621	-.011
Fvr_RD	-.143	.136	.887
Cmptn_Inate	.574	-.063	.588

Table 2
Variable loadings on components

It can be seen that the Component 1 is highly correlated with three of the original variables, i) Rcm_Prdct_Yes (recommended products/services, r=0.797), ii) Chng_Sig (measures impact of introduced products/services, r=0.795) and Prsn_Invn_Bold (conviction that bold risky decisions are necessary to achieve company objectives, r= 0.715). Components 2 and 3 can be interpreted in a similar manner. The double-brackets and rectangles in Table 2 show which variables load most to which of the three components.

Naming the components through interpretation of loadings contributed by each variable is somewhat of a black art in factor analysis. Component 1 consists of the three variables: i) Rcm_Prdct_Yes (Recommended new products), ii) Chng_Sig (Impact of introduced products/services) and iii) Prsn_Invn_Bold (Bold decisions) are necessary to achieve company objectives. All three do seem to have a single conceptual affinity in that they point to the effort of the decision-maker in successfully bringing new significant products/services to the market. Hence, we named Component 1 as *Innovation*. Component 2 also consists of three variables: i) Intro_Frst (Being the first to bring introduce products), ii) Prsn_Hgrsk (Personal liking for projects with high returns) and iii) Adpt_Compt (Ability to adapt/respond to competitors' actions). Their common theme points to an inner urge to be the first in introducing new products by adapting to competition and earn high returns in doing so. Hence, we named Component 2 as *Proactiveness*. Component 3 consists of the two variables: i) Fvr_RD (Decision-maker's inclination to emphasize R&D) and ii) Cmptn_Inate (Focus on initiating competition). Since both the variables involve high risk, we named it *Risk-Taking*.

Calculation of Differential(Δ) EO Scores

The computation steps involved in generating the ΔEO are illustrated below.

	A	B	C	D	E	F	G	H	I
1	Record ID	Rcm_Prdct_Yes	Chng_Sig	Prsn_Invn_Bold	Intro_Frst	Prsn_Hgrsk	Adpt_Cmpt	Fvr_RD	Cmptn_Inate
2	1	1	1	0	5	5	5	1	-1

Suppose, Record #1 contains the above differential data calculated as (Post EO score – Pre EO Score) from the survey completed by a given participant. Thus, positive numbers in Record #1 would indicate a

net increase. Vice-versa, negative numbers mean a net decrease in the ratings across the eight variables for this participant.

	A	B	C	D	E	F
1	Record ID	Rcm_Prdct_Yes	Chng_Sig	Prsn_Invn_Bold	ΔEO (Innovation)	Calculated using the formula
2	1	1	1	0	1.592	=0.797*B2+0.795*C2+0.715*D2
3						
4	Record ID	Intro_Frst	Prsn_Hgrsk	Adpt_Cmpt	ΔEO (Proactive)	
5	1	5	5	5	11.685	=0.893*B5+0.823*C5+0.621*D5
6						
7	Record ID	Fvr_RD	Cmptn_Inate	ΔEO (Risk-Taking)		
8	1	1	-1	0.299	-------------------->	=0.887*B8+0.588*C8
9						
10		Composite ΔEO for a participant =		13.576	-------------------->	=E2+E5+D8

Table 3
Calculation of ΔEO

We have earlier established that the variables Rcm_Prdct_Yes, Chng_Sig, and Prsn_Invn_Bold load on Component 1 and the relative weights for these variables are 0.797, 0.795 and 0.715 respectively. Thus, multiplying the net change in the ratings shown in Record #1 with the Component 1 weights will result in a weighted average value. We refer to this value as the Change in the EO (ΔEO) for Component 1. Since Component 1 was identified as the Innovation concept, we indicate this change by $\Delta EO_{Innovation}$. Its value is 1.592 (cell E2). Cell F2 shows the related weighted average calculation. Repeating the approach, we can also calculate $\Delta EO_{Proactive}$ = 11.685 and $\Delta EO_{Risk-Taking}$ = 0.299. The above descriptive steps are illustrated in the above Excel screenshot. Finally, we compute a Composite ΔEO score by adding all the three component contributions. Thus, the Composite ΔEO = 13.576. This is a measure of the overall change in the EO due to MBA program intervention for this participant. Since this is positive, the MBA program improved the entrepreneurial orientation for this participant.

IMPACT OF THE MBA PROGRAM ON ENTREPENEURIAL ORIENTATION

Since we used differential ΔEO scores in our previous analysis, to test the impact of the MBA program on entrepreneurial orientation, we used a one-sample t-Test by comparing the overall mean of the participants' composite scores against a test value of zero. We performed tests on the original 25 survey responses as well as repeating the procedure with bootstrap option by setting the sample size to 250. Both the results were significant with same mean, but the confidence interval with the bootstrap was narrower.

The mean increase in the ΔEO score was 5.3911 with a *p*-value of zero. The 95% confidence interval was between 3.2523 and 7.75299 without bootstrap. With the bootstrap, the *p*-value was is still very highly significant at 0.008. However, the confidence interval narrowed to a range between 3.4112 and 7.20925. Based on these results, we conclude the null hypothesis—that the MBA program has no impact—has to be rejected. Furthermore, the direction of movement of the ΔEO score was in the positive direction, suggesting that the MBA program has a positive impact on the ΔEO.

CONCLUSION

If graduate business education is going to be an integral part of the answer to the unprecedented challenges and opportunities of the world's turbulent times, the results of this study are encouraging for all faculty

currently involved in an MBA program. The MBA program has eight core and three elective courses one of which is entrepreneurship. Students also have a consulting project where they work in small teams with a real-world client organization on a large-scale project. Such experience ought to be helpful in improving entrepreneurial orientation. Many faculty have a wide array of experience from handling research grants to providing consultation services. A few are entrepreneurs themselves. Prominent business leaders and academicians from surrounding areas are periodically invited to make presentations to the MBA students to show them role models. The dynamics of the business environment and the diversity of a major city where the university is located may also have played a role in enhancing the students' entrepreneurial orientation. Above all, the students might themselves have a lot to do with the good results this study uncovered. They had already a degree and had worked for at least two years both of which were a requirement for MBA admission. They were mature and most likely entered the program with a passion to find new opportunities in their future. They were ready and willing to take responsibility and improve their entrepreneurial orientation levels.

REFERENCES

[1] Alexandrova, M. Entrepreneurship in a transition economy: The impact of environment on entrepreneurial orientation. *Problems and Perspectives in Management,* 2004, 2, 140-148.

[2] Barbosa, S. D., Gerhardt, M. W., & Kickul, J. R. The role of cognitive style and risk preference on entrepreneurial self-efficacy and entrepreneurial Intentions. *Journal of Leadership and Organizational Studies,* 2007, 13(4), 86-104.

[3] Covin, J. G., Green, K. M., & Slevin, D. P. Strategic process effects on the entrepreneurial orientation–sales growth rate relationship. *Entrepreneurship Theory & Practice* (January), 2006, 57-81.

[4] Dess, G. G., & Lumpkin, G. T. The role of entrepreneurial orientation in stimulating effective corporate entrepreneurship. *Academy of Management Executive,* 2005, 19(1), 147-156.

[5] Fayolle, A., Gailly, B., & Lassas-Clerc, N. Assessing the impact of entrepreneurship education programmes: a new methodology. *Journal of European Industrial Training,* 2006, 30(9), 701-720.

[6] Gaddam, S. Identifying the relationship between behavioral motives and empirical study based on the perceptions of business management students. *Icfalan Journal of Management Research, VII*(5), 2008, 36-55.

[7] Kreiser, P. M., Marino, L. D., & Weaver, K. M. Assessing the psychometric properties of the entrepreneurial orientation scale: A multi-country analysis. *Entrepreneurship Theory & Practice*(Summer), 2002, 71-94.

[8] Krueger Jr., N. F. What lies beneath? The experiential essence of entrepreneurial thinking. *Entrepreneurship Theory & Practice*(January), 2007, 123-138.

[9] Lee, S. M., & Peterson, S. J. Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business,* 2000, 35(4), 401-416.

[10] Lumpkin, G. T., Wales, W. J., & Ensley, M. D. *Entrepreneurial orientation effects on new venture performance: The moderating role of venture age*. Paper presented at the Academy of Management Best Conference Paper, 2006.

[11] Moreno, A. M., & Casillas, J. C. Entrepreneurial orientation and growth of SMEs: A causal model. *Entrepreneurship Theory & Practice,* 2008, 32(3), 507-528.

[12] Tang, J., Zhang, Y., Tang, Z., & Li, Q. The impact of entrepreneurial orientation and ownership type on firm performance in the emerging region of China. *Journal of Developmental Entrepreneurship,* 2007, 12(4), 383-397.

[13] Shadish, W. R., Cook, T. D., & Campbell, D. T. *Experimental and quasi-experimental desgins for generalized causal inference*, Wadsworth Cengage Learning, 2002.