

Summative Evaluation of the Nationwide German “exist-priMEcup” Competition for Game-based Entrepreneurship Education

1. INTRODUCTION AND OBJECTIVES

Teaching and training entrepreneurship is a constantly increasing field of activities in German universities. Since 2005 we have carried out several studies in the area of entrepreneurship education with the application of games that simulate start up businesses and general management processes, further called “start-up games” (e.g. Kriz, Auchter & Wittenzellner, 2008). One part of the studies is the research of the learning effects and assessment feedback of students participating in the nationwide German competition “exist-priMEcup”. This program is carried out with about 140 German universities and about 30 leading companies on behalf of the German Federal Ministry of Economics and Technology. It is a voluntary activity for students of all faculties and courses of studies that are enrolled in German universities.

The purpose of our formative evaluation approach is to find out the extent to which the games contribute in qualifying and positively predisposing students to become entrepreneurs. In our evaluation we also use qualitative methods: we carried out more than 50 interviews and have analyzed written feedback from more than 2000 students. Together with the quantitative approach using an evaluation questionnaire, we gain results that we use in a formative way to constantly optimize the game scenarios and game facilitation and debriefing methods and other aspects of the cup activities. However in this paper we concentrate on presenting the summative results of the questionnaires.

The annually organized “exist-priMEcup” has four levels. On “Campus Cup” level teams of students compete within their own university. The best two teams of each university are allowed to enter the next level of the “Master Cup”, in which teams from different universities compete. Again, the two winning teams of each Master Cup enter the next level of “Professional Cup”. Master and Professional Cups are conducted in universities and in partner companies. The last level is the final “Champions Cup” in which the best student teams compete for winning the German championship, conducted at the Konrad Adenauer Foundation in Berlin.

Fig. 1: structure of the program “exist-priMEcup”

In each cup level the same simulation game methodology is used, but with increasing complexity of scenarios and simulated variables. In principle computer assisted general management games are used with some especially developed start-up game aspects. Start-up games are special business games that foster the development of competences needed to perform the management tasks in a newly founded company successfully. The main focus is on the action and decision making processes in the start up stage. The simulation game “TOPSIM-Start-up” was developed by Tata Interactive Systems in co-operation with the University of Applied Sciences Regensburg and the Hans Lindner Institute. The game represents the complexity and the relevant variables in different start-up situations, and covers all stages of a start-up business from collecting information, checking the business idea to transforming the business idea to a successful company in a competitive situation.

On each level the qualified student teams participate in two-day cup activities. In each cup activity 4-12 teams (with 3-6 members) compete against each other. They create business plans and start a business, market entry is simulated and they have to compete with the other teams on shared and simulated marketplaces, dealing with realistic and authentic management decisions and special scenarios that are characteristic of a start-up situation. Not only the results of the simulation rounds count for the final scores of the teams (calculated by weighted different criteria like stock prices, gains, production capacity utilization, customer satisfaction, market shares, personnel qualification, etc.). From Master-cup level teams additionally have to present their results and defend their decisions and give clear and well-grounded statements about future strategies in front of a jury. The assessments of the jury count 25% of the total score. The jury is composed of real company founders and top managers of the partner companies as well as business professors from the partner universities.

2. THEORETICAL BACKGROUND

Explicit knowledge alone about start up management is not a sufficient basis to cover the day to day challenges of an entrepreneur. The model of Brinckmann, Salomo & Gemünden (2006) describes tacit knowledge and technical and methodological competencies, social competencies and entrepreneurial competencies as key factors that led to profit and market success of 180 German start-up companies. There is widespread discussion that entrepreneurial activities are traceable to specific bundles of competencies and motivation, which in turn are influenced by personality factors

(Walter & Walter, 2009; Cooper, & Lucas, 2006; Müller, 2002; Braukmann, 2001; Krueger, Reilly & Carsrud, 2000; Covin & Slevin, 1991). Based on these insights we investigated the correlation of entrepreneurial predispositions and personality factors with the learning and motivational effects of start up games assessed by the students.

3. METHOD AND DATA

For the summative assessment an evaluation questionnaire is used that is handed out after each cup activity and answered by the students. This questionnaire contains 35 assessment-items on a 6-point ordinal scale (1=very good assessment or total agreement with a statement; 6=very bad assessment or total disagreement with a statement). It also contains items to gain socio-demographic data and items to ask for personality aspects (related to entrepreneurship research) and pre-knowledge and experiences and attitudes (about business knowledge, teamwork, simulation games etc.). However, partly different additional items were introduced in the four cup levels. We used a special codification system for the participants. This allows for the linking of individual participant's data at different cup levels (for those participants qualifying for the next levels) and makes it possible to calculate paired sample results.

The average rate of return of the questionnaires was 97%. In 2007 N=815 students participated in 43 cups in the evaluation, 2008 N=1706 in 76 cups and in 2009 N=1624 in 80 cups (total N=4145 students in 199 cups). All significant results presented are significant on alpha probability value $p < .001$.

4. RESULTS AND DISCUSSION

With the data from all participants of the Master Cup level of 2007 (N=501) and using only those 35 assessment items that are the same in the four questionnaires (of the four different cup levels) a factor analysis was performed (Eigenvalue > 1 ; varimax-rotation) and accordingly seven scales were composed (additional analysis of reliability show high Cronbach Alphas $> .86$). The seven factors explain more than 82% of the total variance. The seven factors are:

- Organization and information (including assessment of facilitator quality and debriefing); 6 items
- Room setting and time schedule; 2 items
- Acquisition of personal and social skills through playing the game; 8 items
- Satisfaction with the game play (competition and teamwork); 4 items
- Satisfaction with quality of Jury-feedback and benefit through the feedback; 2 items
- Acquisition of business knowledge and skills through playing the game; 8 items
- Overall satisfaction with cup event and game; 5 items

Tab. 1: Assessment of Start-Up games in “exist-priMEcup” (means)

The results (cf. table 1) show a very positive assessment at all cup levels and on all dimensions. In addition we calculated average scores for each single game play event. Looking at all 199 game plays no single cup was rated worse than 2.5 on a six point scale (1= very good, 6=very bad). In the Master-cup level we also asked (2 additional items) if and how the image of the hosting partner companies have changed, as a result of the games being played in the facilities of the companies (normally including a guided tour through the company, sponsorship of catering and participating managers in the jury). In all Master-cups the company-images gained strongly. Students see those companies after the games as much more attractive potential employers. More important - taking into account the goals of the program - is another result: students declared that competencies and interest to become an entrepreneur increased through playing the start up game.

Looking at the assessments of the different levels we found a small decrease from the Master to the Professional level as well as an increase to the Champions level. This “bend-effect” appeared over the three years of the evaluation and is significant (t-test with paired samples). The main explanation is that on the Professional level participants see the lowest additional benefit or increase of own competencies. At the same time there is the toughest screening on this level. On the Master-cup level 2 of 4-6 teams qualify for the next level. On Professional level 2 of 12 teams qualify for the final level. Thus the majority of teams quit in this level. There is some influence of disappointment that may be one cause for this bend-effect. To reach the final round at the same time gives a positive mood which influences the increase in the Champions-cup.

Further analysis show that the quality of debriefing and feedback from the facilitators and from the jury and also the quality of team-reflexivity (giving feedback between team members during the game) plays an important role for the student's satisfaction.

Other analysis (based on t-tests and analysis of variances methods) show that participants with higher entrepreneurial competence, attitudes and predisposition assessed the cups significantly better (e.g. higher satisfaction, rating of own learning effects etc.). Participants with higher attitude to risk, propensity to lead, belief in internal control/internal causal attribution, achievement motivation (this data was retrieved from additional items in the questionnaires) benefit more and more easily adopt the role of an entrepreneur in the game. There are no significant differences in the assessments of different age-groups or students from different courses of study. We found gender effects: female students benefit less from the cup activities than male students

5. SUMMARY AND CONCLUSION FOR ENTREPRENEURSHIP RESEARCH

The program and the games used are a success. Students report an increase of competencies and entrepreneurial intention through the simulation game. In general the start-up games and the "exist-priMEcup" can be considered a very effective educational method for entrepreneurship training. The start-up management simulation game has an outstanding high degree of acceptance from the trainers' and students' perspective, as well as from the point of view of the managers of the hosting companies. Various results of the presented summative evaluation in combination with written feedback and interviews led to a list of more than 30 concrete recommendations for quality improvement. These lessons learned were summarized in a written report, communicated and discussed in workshops together with program directors and facilitators of the cups. Based on these adjustments changes in game scenarios and facilitation were implemented. The summative and output oriented evaluation thus supports the formative evaluation and quality management of the educational program. The results are in consistence with entrepreneurship research about the impact of entrepreneurial attitudes and personality factors. In current and further research we concentrate on a more detailed exploration of the gender effects in order to optimize the program for female students.

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Fig. 1: structure of the program “exist-priMEcup”

Tab. 1: Assessment of Start-Up games in “exist-priMEcup” (means)

CUP-LEVEL 1	Campus 2009 N=590	Campus 2008 N=431	Campus 2007 N=65
Organization and information (including assessment of facilitator quality and debriefing)	2.16	1.98	1.90
Room setting and time schedule	1.85	2.04	2.02
Acquisition of personal and social skills through playing the game	1.91	2.72	2.96
Satisfaction with the game play (competition and teamwork)	2.77	1.58	1.51
Acquisition of business knowledge and skills through playing the game	1.63	2.31	2.25
Overall satisfaction with cup event and game	2.22	2.23	2.21
CUP- LEVEL 2	Master 2009 N=708	Master 2008 N=913	Master 2007 N=501
Organization and information (including assessment of facilitator quality and debriefing)	1.74	1.80	1.77
Room setting and time schedule	1.86	1.94	1.79
Acquisition of personal and social skills through playing the game	2.44	2.53	2.54
Satisfaction with the game play (competition and teamwork)	1.51	1.47	1.41
Satisfaction with quality of Jury-feedback and benefit through the feedback	1,78	1,75	1,82
Acquisition of business knowledge and skills through playing the game	2.03	2.04	1.99
Overall satisfaction with cup event and game	1.97	2.00	1.98
CUP- LEVEL 3	Professional 2009; N=281	Professional 2008; N=302	Professional 2007; N=200
Organization and information (including assessment of facilitator quality and debriefing)	2.06	2.07	2.03
Room setting and time schedule	2.15	2.21	2.07
Acquisition of personal and social skills through playing the game	2.64	2.61	2.45
Satisfaction with the game play (competition and teamwork)	1.43	1.47	1.43
Satisfaction with quality of Jury-feedback and benefit through the feedback	2.29	2.21	1.94
Acquisition of business knowledge and skills through playing the game	2.37	2.40	2.13
Overall satisfaction with cup event and game	2.27	2.26	2.03
CUP- LEVEL 4 (Final)	Champions 2009; N=45	Champions 2008; N=60	Champions 2007; N=49
Organization and information (including assessment of facilitator quality and debriefing)	1.89	1.82	1.66
Room setting and time schedule	2.02	1.58	1.54
Acquisition of personal and social skills through playing the game	2.11	2.24	2.03
Satisfaction with the game play (competition and teamwork)	1.20	1.34	1.38
Satisfaction with quality of Jury-feedback and benefit through the feedback	2.00	2.13	1.81
Acquisition of business knowledge and skills through playing the game	2.09	2.14	2.84
Overall satisfaction with cup event and game	1.95	1.96	1.66