



Der „EXIST-priME-Cup“, gefördert vom deutschen Bundesministerium für Wirtschaft und Technologie, ist ein bundesweiter Planspielwettbewerb für Studierende. Dabei sind jährlich über 150 deutsche Hochschulen involviert. Seit 2007 wird das Programm von den Autoren laufend evaluiert. Die folgende Veröffentlichung ist im Rahmen der wissenschaftlichen Evaluation des exist priMECup entstanden.

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Summative evaluation of the nationwide German “Start-Up-Game” competition for entrepreneurship education

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Abstract. In this paper we report the summative results of an evaluation of a nationwide German entrepreneurship education program. In the “exist-program” a competition with four levels – the so called “exist-priMEcup” – is carried out together with about 140 German universities and about 30 leading companies. The main part of the competitions and events within the program are especially designed start-up and general management simulation games. In the last three years (2007-2009) more than 4000 students participated and completed a questionnaire in order to evaluate several aspects of the program and the simulation games.

1. INTRODUCTION

In German universities teaching and training about entrepreneurship is of more and more importance. To get a new company started is a complex task and requires from its founders a wide range of competencies and knowledge (Kriz & Auchter, 2006). The computer supported business simulation game “TOPSIM-Startup” 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.

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; 2009). These studies are conducted under the auspices of the German Federal Ministry of Economics and Technology.

One part of the studies is to research the learning effects and assessment feedback of university students participating in the nationwide German competition “exist-priMEcup”. This program is carried out together with about 140 German universities and about 30 leading companies. In the last three years (2007-2009) more than 4000 students participated and completed a feedback questionnaire.

The purpose of our formative and theory-based evaluation approach (cf. Kriz & Hense, 2006; Hense & Kriz, 2008) is to find out the extent to which the games contribute in qualifying and positively predisposing students to become entrepreneurs. Evaluation of the learning effects connects our approach to theory testing in the analytical science tradition (e.g. educational psychology and entrepreneurship research). At the same time our assessments of the impact of the games fit into the design sciences tradition (cf. Klabbers, 2006; 2008). It generates practical usability with regard to optimizing the educational programs for students (Kriz & Auchter,

2007). 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.

2. CUP EVENTS AND START UP GAMES

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 by the Konrad Adenauer Foundation in the German capital city of Berlin under the auspices of the German Federal Ministry of Economics and Technology.



Figure 1: structure of the program “exist-priMEcup”

The program is a voluntary activity for students of all faculties and courses of studies that are enrolled in German universities. Participants receive a certificate of participation.

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 successfully the management tasks in a newly founded company. The main focus is on the action and decision making processes in the start up stage. Because the early stages of a start up provide prime examples of complex tasks, games provide a particularly appropriate learning environment. Since 2000 "TOPSIM-Start-up" has provided a newly developed game-family that simulates the start up situation and its various stages. The Start-up game was developed by Tata Interactive Systems in co-operation with the University of Applied Sciences Regensburg and the Hans Lindner Institute. There are different versions of the game in respect of complexity and scenarios.

The main learning goals are:

- Definition and realization of goals, strategies and business plans within an authentic business and market environment
- Company cost accounting, planning and controlling
- Dealing with complex decision-making situations and uncertainty
- Working together within a management-team and competition with other teams
- Simulation and forecasts with computer-assisted planning models and tools
- Presentation of own business results in front of a jury with assessors from companies

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 make business plans and start-up a company, 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 weighting different criteria like stock prices, gains, production capacity utilization, customer satisfaction, market shares, personnel qualification etc). In addition from Master-cup level teams 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 jury is composed of real company founders and top managers of the partner companies as

well as business professors from the partner universities. In the final Champions-cup awarded entrepreneurs, CEO's, university presidents and state secretary of Economy are in the jury.

3. METHOD AND DATA

For the summative assessment an evaluation questionnaire is used that is handed out after each cup activity. This questionnaire contains about 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 items (and number of items) were used 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 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 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

Table 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

The results (cf. table 1) show a very positive assessment of all cup levels and on all dimensions. In addition we calculated average scores for each single game play event and found that 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 items) how the images of the hosting partner companies has changed, because of playing the games 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 we found that 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 a further 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 in all three years a small decrease from the Master to the Professional level as well as again an increase to the Champions level. This “bend-effect” 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 on this level there is the toughest screening. In the Master-cup 2 of 4-6 teams qualify for the next level. On Professional level 2 of 12 teams qualify for the final level. This means that 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 and predisposition assessed the cups significantly better (e.g. higher satisfaction, rating of own learning effects etc.), e.g. 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).

There are no significant differences in the assessments of different age-groups or students from different courses of study. It is allowed that teams that qualify for the next round may replace team members who are not able to participate in the next round due to personal reasons. Therefore there are in average 10-20% of newcomers. Unfortunately newcomers assess the cup and the game significantly worse compared with the experienced team members. For the teams it

seems that it is more difficult to integrate newcomers into their teams and make use of their skills and for the newcomers it is difficult to hook up and to understand the game dynamics itself, especially if they enter late (on Professional-level). They lack the experience with the game and are directly confronted with a model of increased complexity and difficulty level.

5. SUMMARY AND CONCLUSION

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 managers of companies (acting as members of the jury in the cups; with trainers and jury members additional interviews have been conducted). 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. In this way the summative and output oriented evaluation supports the formative evaluation and quality management of the educational program. It also shows that games are effective learning methods for the training of competencies in societal relevant areas.

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