



## EVALUATION

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 priME Cup entstanden.

Kontakt:

Prof. Dr. Willy Kriz (persönlich)  
Fachhochschule Vorarlberg  
Hochschulstrasse 1  
A - 6850 Dornbirn, Österreich  
[willy.kriz@fhv.at](mailto:willy.kriz@fhv.at)

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## Evaluation of Simulation Games in the German entrepreneurship education program “exist-priME-cup”

Willy C. Kriz  
*University of Applied Sciences Vorarlberg, Dornbirn*  
Eberhard Auchter  
*University of Applied Sciences, Regensburg*  
Helmut Wittenzellner  
*University of Applied Sciences HDM, Stuttgart*

Keywords: simulation games, evaluation, entrepreneurship education, nationwide contest

### Abstract

The paper presented here is mainly based on the results of applying simulation games under the auspices of the German Federal Ministry for Economy and leading companies. For entrepreneurship education a nationwide competition “exist-priMEcup” is carried out. The



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aim of this program (running from 2007 to 2009) is to foster entrepreneurial competencies and to influence the intention of the participants to start up an own company. Using different startup and business simulation games more than 3000 students of more than 100 universities compete in four levels. In each cup level the same simulation methodology is used, but with increasing complexity of scenarios and simulated variables. For the evaluation a questionnaire is used that is handed out after each cup event. In the paper we describe the program, the simulation games used and the evaluation method and results of the first year of the program. The results support major findings of entrepreneurship research about the importance of certain bundles of competencies, motivation and personality factors in predicting performance (in the simulation), increase of competencies and entrepreneurial intention through the simulation game. In general simulation games can be considered a very effective educational method for entrepreneurship training. The program has an outstanding high degree of acceptance in the perspective of the trainers, the students and the managers of companies who acted as members of the jury in the cup-system.

### 1. The Program “exist-priME-cup”

In Germany teaching and training in entrepreneurship is in great demand in universities, and also in the field of start-up consultancy. The program “exist-priMEcup” is currently running (2007-2009) under the auspices of the German Federal Ministry for Economy in cooperation with about 200 universities and about 50 leading German companies. It is a nationwide management competition in four levels.



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The general aim of this program is to foster business management and entrepreneurial competencies and to influence the intention of the participants to start up a company. The more specific 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

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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Figure 1: Map of Germany with places of Master-Cups and Professional-Cups

“Start-up” and management simulations are carried out on all four levels of the program (see figure 2). On “Campus Cup” level teams of students and young professionals compete within the same 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. In Figure 1 the places of the Master Cups of the year 2007 are shown. Again, the two winning teams of each Master Cup enter the next level of “Professional Cup”. All Master-Cups are allocated to six regions and in each region (A-F in figure 1) one Professional Cup is carried out. The last level is the final “Champions Cup” in the German capital city Berlin with the best 15 teams.

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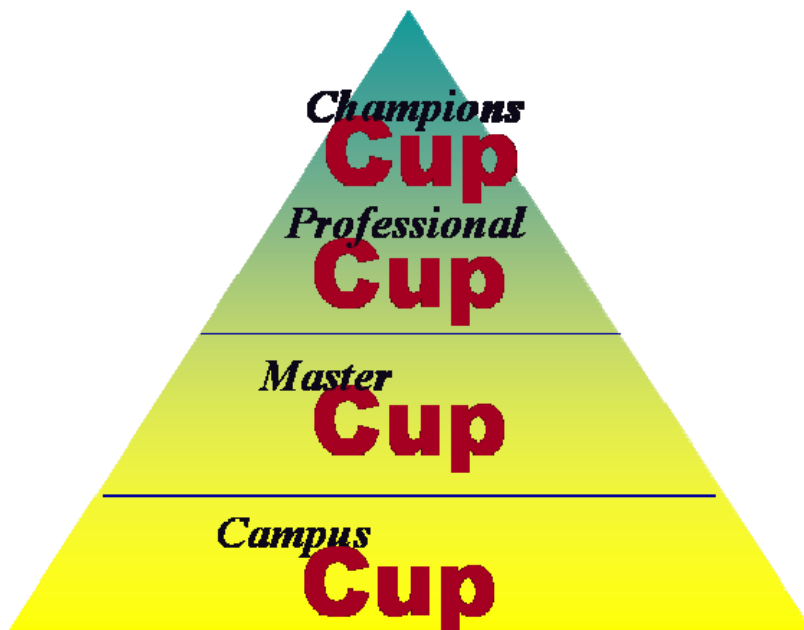


Figure 2: structure of the program “exist-priMEcup”



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## 2. Simulation Games used within the “exist-priME-cup”

To get a new company started and/or to manage an existing company are complex tasks and require from its founders and managers a wide range of competencies and knowledge, such as strategic thinking, coping with complex information under uncertainty, knowledge of planning and running companies. These competencies can be fostered in an experiential way with the methods of Gaming Simulation. The computer supported business simulation games “TOPSIM-Startup” and “Topsim-General Management” represent the complexity and the relevant variables in different start-up and business situations, and cover 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.

The simulations used in the program were developed by the firm Tata Interactive Systems in co-operation with the University of Applied Sciences Regensburg and the Hans Lindner Institute. They are in use in more than 50 universities and in many other training and further education institutions in Germany as business simulations are a widespread element in the curricula of entrepreneurship education in German universities.

There are different versions of the game. In each cup level the same business simulation methodology is used, but with increasing complexity of scenarios and



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simulated variables. In addition the participants are confronted with special tasks that are connected with the simulation. One of these main special tasks is for example a general meeting of shareholders. The participants as managers have to present the business results of the last four simulation rounds (each simulation round represents a quarter of a year), the strategies, the future decisions and perspectives etc. These presentations are performed in front of a jury (playing the roles of shareholders). The members of the jury are selected from the management of the partner companies of the exist-priME-cup-program and they analyze the results of the simulated companies in the general meeting discussion. The performance of the participants is assessed by the jury and the results of this assessment flow into the final results of each team. Therefore not only good simulation game results and professional business knowledge and skills are necessary to win, but social skills of presentation, communication and reasoning as well.

### 3. Entrepreneurship Education

Entrepreneurship education aims at fostering and influencing of competencies and attitudes that are needed for a successful start up and management of a company. The model of Brinckmann, Salomo & Gemünden (2006) describes technical and methodological competencies, social competencies and entrepreneurial competencies as key factors that led to profit and market success of 180 German



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start-up companies that took part in a research study carried out in 2005. Entrepreneurial behaviour as a success factor has been intensely discussed (e.g. Frank, Korunka & Lueger, 2002). There is widespread opinion that entrepreneurial activities are traceable to specific bundles of competencies and motivation, which in turn are influenced by personality traits (Kriz, Auchter & Wittenzellner, 2008). Based on these insights it is suggested that the following pattern of competencies and inclinations should be investigated in connection with simulation seminars:

- Technical and methodological competence: By technical competence is meant the specialist knowledge that is needed to found and lead an enterprise. To these belong areas such as: business plan development, internal and external accounting and financing.
- Social competence: Social competence describes the ability of a person to work effectively together with other people. This means not only the ability to co-operate and communicate with other people, but also the ability to understand the actions of others.
- Entrepreneurial competence: This feature relates especially to competencies which makes the entrepreneur stand out as an entrepreneur. There is a one to one correspondence between competence in this sense and the idea of “entrepreneurial posture” in the conceptual model of Covin & Slevin (1991). In this respect entrepreneurial posture is made operational by three sub-features: risk taking (preference for highly risky projects with the chance of



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making a very high profit); proactive orientation (the willingness to initiate action and projects that competitors are forced to react to); innovation (the willingness to innovate, even when this involves taking on risks).

- Entrepreneurial predisposition: By this is meant personality traits which are a prerequisite for entrepreneurial success and which have been to some degree empirically proven. Much insight in this respect can be abstracted from contemporary psychological research literature on the subject of founders of companies (e.g. Müller, 2002). The following are regularly mentioned as being particularly relevant personality features: achievement motivation; belief in internal (self) control and self-efficacy; willingness to prevail; desire to be independent; emotional stability; propensity to lead.
- Intention and motivation to start up a business: As well as the bundles of competencies just mentioned, we should in addition explicitly record the motivation for a start up (Krueger, Reilly & Carsrud, 2000).

#### 4. Evaluation method

The starting points of most simulation evaluations are traditionally of the summary kind, and thus output oriented in the first instance. They focus on the effectiveness of the participation in the simulation, mainly in order to assess the degree of learning and satisfaction that has taken place (Kriz & Hense, 2004). This approach and the efficacy analyses of simulations that stem from it are an important part of



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the evaluation that is being presented here. Nevertheless, this traditional approach can be regarded as being somewhat too narrow, in view of the fact that purely output oriented evaluations are not sufficiently able to explain why and how the results of learning that arise from a particular measure are achieved (Kriz & Hense, 2006; Hense & Kriz, 2008). In the program exist-priMe-cup we use a blend of classical summary and output oriented approaches coupled with a formative evaluation, which has the purpose of providing information from the 2007 program for the optimal design of the cups in the following years 2008-2009.

The main research goals of the evaluation are:

- To find out if the used business simulations are an efficient way of imparting the professional and social competencies, the self-confidence and the intention that start up entrepreneurs need.
- To find out the extent to which the program is making a contribution to qualify and positively predispose those considering entrepreneurial activities.
- Creating a scientifically founded basis for the further development of business simulation systems and -seminar conceptions.
- To optimize the cups and events within the whole program.

As the program just started in 2007, only the data from the master level (N=501 participants in 32 cups), the professional level (N=200 participants in 6 cups) and the



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champions level (N=49 participants in one final cup) are available. For the evaluation a questionnaire was used that was handed out after each cup. Due to time constraints of the cup system, only one questionnaire was used after each cup. However, partly different items were used in the various 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.

With only one questionnaire that is used after the cups it is possible to gain summative evaluation results. In order to meet our evaluation objectives we linked the actual evaluation in addition with previous research studies (Kriz & Auchter, 2006). The questionnaire therefore contains partly the same items from those other studies in which we used a comprehensive theory based evaluation method with measurements before, during and after applying the same simulation games. Participants of this actual study can be seen as another treatment group, because attending the cup is voluntary for interested students, whereas attending the same simulation games in the studies of Kriz & Auchter (2006) was a regular obligatory part of the students’ university course program.

All significant results presented are significant on alpha probability value  $p < .001$ .



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### 5. Evaluation results

Aim of this short paper is to present only some general overview results. Detailed analyses will be discussed in further publications.

Participants assessed the organization of the cups (preparation, information, rooms, duration of cup, quality of simulation-handbooks etc.) and quality of the facilitators and the jury (managers of companies) very highly, means varied from 1.34 to 2.01 on a six point Likert scale (with 1=“very good” to 6=“very bad”) in the whole sample. Participants were also satisfied with the degree of participation and would recommend the experience to others (means from 1.46 to 1.70). They reported that their social, personal and professional competences (business knowledge and understanding of complex business and market dynamics) were raised, and that their interest in starting up a self-owned business grew (means from 1.92 to 2.45).

|  | Master<br>N=501 | Professional<br>N=200 | Champions<br>N=49 |
|--|-----------------|-----------------------|-------------------|
| Cup-organization and Trainer quality (5 Items)     | 1,77            | 2,03                  | 1,66              |
| Room/Space arrangement and Time/Duration (2 Items) | 1,79            | 2,07                  | 1,54              |
| Fostering personal and social skills (4 items)     | 2,54            | 2,45                  | 2,03              |



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|   |      |      |      |
|---|------|------|------|
| Situation/business competition (2 Items)                  | 1,41 | 1,43 | 1,38 |
| Competence of Jury (2 Items)                              | 1,82 | 1,94 | 1,81 |
| Fostering professional skills and satisfaction (12 items) | 1,99 | 2,21 | 1,98 |
| Overall Score of all 27 assessment items                  | 1,97 | 2,12 | 1,84 |

Table 1: means of assessment scales

The overall score (mean) of all assessment items was 1.97 in the Master Cup and 2.12 in the Professional Cup and 1.84 in the Champions Cup. This small decrease from the Master to Professional level as well as the increase to the Champions level is a significant effect (t-test with paired samples). Further analysis shows that the quality of debriefing and feedback from the facilitators in the Professional Cup was assessed significantly lower (the participants had higher expectations to receive a deeper understanding of the complex relations within the simulation game, and they wished for deeper reflection on correlations between simulation and real companies compared with the Master Cup level). Alternatively, results could still be considered favorable, as no single cup (32 Master Cups, 6 Professional Cups and the Champions Cup) was rated worse than 2.5 in the overall score (1.0 to 3.5 is a



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positive assessment, 3.51 to 6.0 would have been a negative assessment of the participants).

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 (see theoretical framework above). As mentioned, participants of this can be seen as a separate special treatment group compared with Kriz & Auchter (2006): attending the cups was a voluntary activity for the participating students and attending the simulation games in previous studies was a regular obligatory part of the university course program. In comparison, participants of the exist-priME-cup indicated a significantly higher interest in the simulation than students in the regular university courses. Students participating in the cup also have a significantly higher entrepreneurial competence and predisposition than students of the regular university courses.

## 7. Summary and conclusions



## EVALUATION

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.

Kontakt:

Prof. Dr. Willy Kriz (persönlich)  
Fachhochschule Vorarlberg  
Hochschulstrasse 1  
A - 6850 Dornbirn, Österreich  
willy.kriz@fhv.at

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As a whole, these results show the importance of a formative and theory-based evaluation, which can contribute to the improvement of an educational program. In the exist-priME-cup program the results are taken for further optimization (especially the debriefing at the professional level will be redesigned and a special training for the facilitators will be implemented). Consequences from the analysis of the Master Cups and the Professional Cups were implemented already in the final level of the program in 2007 and resulted in a significantly increased rating and excellent performance in the Champions Cup.

In general, the evaluation shows that entrepreneurial competencies as well as self-confidence to become an entrepreneur were fostered as a result of the gaming sessions. The results show an increase of entrepreneurial intention in the special group of voluntary and best performing students of the professional cup level. Those students do also show significant higher entrepreneurial competence and predisposition than students of the regular university courses.

The results support major findings of entrepreneurship research about the importance of certain bundles of competencies, motivation and personality factors in predicting performance (in the simulation), increase of competencies and entrepreneurial intention through the simulation game. In



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general, simulation games can be considered a very effective educational method for entrepreneurship training. The Startup and management simulation game has an outstandingly high degree of acceptance from the trainers’ and students’ perspective, as well as from the managers of companies as acting as members of the jury in the cups (with trainers and jury members additional interviews have been conducted).

A main topic for our further research will be the exploration of long-term effects of the program and assessment of the effects of changes in the program and impact of optimizations in facilitation and debriefing of the simulation games implemented in the next program of 2008.

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### Contact

Prof. Dr. Willy C. Kriz,  
University of Applied Sciences Vorarlberg, Dornbirn  
Department of Management and Research Methods  
Hochschulstrasse 1, A-6850 Dornbirn, Austria  
willy.kriz@fhv.at + 43 5572 792 3218

Prof. Dr. Eberhard Auchter,  
University of Applied Sciences, Regensburg  
Business Simulation Center, Seybothstraße  
Postfach 12 03 27, D-93025 Regensburg  
eberhard.auchter@bwl.fh-regensburg.de

Prof. Dr. Helmut Wittenzellner,  
University of Applied Sciences HDM, Stuttgart  
Media Entrepreneur Center, Nobelstraße 10, D-70569 Stuttgart  
wittenzellner@hdm-stuttgart.de