

# An Educational Game for Entrepreneurship and Sustainability

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**Abstract:** An educational game for entrepreneurship was developed in a cooperation of Central University of Technology and Aalen University. The relation to Sustainable Development is twofold: the game will be a contribution to socio-economic development via entrepreneurship and a contribution to Education for Sustainable Development (ESD). In a project sponsored by the Baden-Württemberg Department of Science, Global Citizenship was also considered as an educational goal and was integrated into the game components. This paper discusses the role of educational games for entrepreneurial and managerial skills, sustainable development and global learning. We present the game system VAL-U based on the concept of value and of values. We analyse the concept development, the deployment project and first experiences with the rollout.

**Key words:** educational game; global citizenship; global learning entrepreneurship education; sustainable development; socio-economic development; planning games; small and medium enterprises

**JEL codes:** A290, Q560

## 1. Introduction

Socio-economic development for all countries and globally responsible use of natural resources are the two pillars of sustainable development. In order to achieve socio-economic development and to create workplaces and wealth, entrepreneurial thinking is required and for this, fundamental training for future entrepreneurs is necessary. This training should also address sustainability issues such as protection of nature, preservation of resources and culture, justice and human rights, welfare and global citizenship. Sustainable development means responsible business and new chances for enterprises.

In many discussions within the last years, the need showed up for a basic training in economics skills. Entrepreneurs like small scale farmers, guesthouse managers and tour operators, engineers and innovators, shop managers and craftsmen need basic knowledge in economics. The same holds for young academics: to ensure employability outside the ivory tower, no one should graduate without elementary knowledge about the function of an enterprise. Also within larger organizations — in industry, administration and academia-economic knowledge and managerial skills are needed to run smaller units efficiently; we call this entrepreneurial thinking within a bigger organization intrapreneurship. There is a need for such entrepreneurial skills and hence a demand for entrepreneurial education in developed and in developing countries.

This entrepreneurial education can directly support the socio-economic development of a country or region. Moreover, entrepreneurial education is a contribution to the shaping competence (“Gestaltungskompetenz” de

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Haan & Harenberg, 1999) and hence a contribution to Sustainable Development. Last but not least, entrepreneurial education can integrate concepts of values and global learning.

The question arises, whether the gap between the need for entrepreneurial education and the existing formal education can be filled by means of an educational game (Remmele & Seeber, 2007; Holzbaur, Jordaan & Bühr 2013). To allow a widespread use, the game should be simple and inexpensive. It should also integrate two aspects: Entrepreneurship education, motivation and self-assessment for future entrepreneurs as the core function to support entrepreneurship; and training for the necessary skills and knowledge for future entrepreneurs to give the business a chance to survive and the entrepreneur a chance for success. "... in order to have start-ups in a society, there must be potential entrepreneurs. Later in the process, people who have started businesses must have the ability and the support to enable them to sustain their businesses into maturity." (Herrington & Kew, 2013).

Following theoretical considerations and practical experiences with educational games, a concept for such a game was developed. The challenge remained to integrate several educational concepts and entrepreneurial aspects in order to provide training for all relevant skills. Further research led to the concept of integrating entrepreneurship education with the concept of values and to use this as a basis for various components (levels) of the game system. The levels were then combined with the relevant entrepreneurial knowledge and with corresponding game concepts.

In order to transfer the concept into real-world training and to achieve concrete results, a project plan for the development and deployment was derived. The development of the educational game system is a joint effort of Aalen University (Hochschule Aalen HSAA) and Central University of Technology, Free State (CUT). The adaption and deployment will be organised by a team from the CUT management faculty.

## **2. Background**

The considerations for the game system are based on the author's work on education for sustainable development and educational games (Holzbaur, 1993, 2001, 2013) and on many interviews and discussions in Germany and South Africa.

### **2.1 Sustainable Development and Real World Laboratories**

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). The transition to sustainable development is a challenging task for states, organisations, societal groups, and individuals. The "great transformation to sustainability" (WBGU 2011) will require the contribution of all groups in society. Research for sustainability includes integrative prospects and transdisciplinary research. Schneidewind (2013) has emphasized the importance of "real world laboratories" ("Reallabor" in the sense of "living labs" for research on sustainable development, or of "transition labs" for research about the great transition to sustainable development) for transdisciplinary research projects. In that sense, the entrepreneurial education project considered in this paper will implement a real world laboratory for socio-economic development, entrepreneurship education and sustainable development.

### **2.2 Educational Games for Socio-economic Development**

Gaming is a well-known training method that can claim its roots back to the chess game. Games have been used in military and management (Elgood, 1989) education for a long time. There is a set of notions for these games referring to the historical background (war games), the decision orientation (planning games), to the use in

management education (management games), the use of models (simulation games), or to the implementation as computer games (serious games). For the VAL-U concept we will use the notion of educational games to indicate that we focus on the pedagogic use of the games: educational games are simulation games which involve situation analysis and decisions in one or several roles and which are aimed for education and training.

Enabling people to get employment is a necessary prerequisite for development, but in this paper, we will mainly concentrate on the aspect of creating new jobs through new enterprises. Entrepreneurship is the attitude to start an enterprise and to take well-calculated economic risks. There are many subjects and issues needed in entrepreneurship including financial and legal aspects (e.g., Pott & Pott, 2015), so we want to concentrate on some core issues. Entrepreneurship is based on the will to take decisions and to act. The entrepreneur is acting within an economy and invests his own time and money to achieve an economic goal. Remmele & Seeber (2007) state that entrepreneurship and gaming are strongly related since both are focused on activity and the will to act.

Management is an important aspect for entrepreneurship. Although starting an enterprise may be a one-man-show, a successful entrepreneur needs to involve other people — customers, employees, and partners. Innovators must involve their working groups as well as their peers.

### **2.3 Global Learning and Shaping Competence**

Global Learning means to become aware about the role and responsibility of the company and the individual for global development.

For a start-up it can be important to realize the chances and benefits of international trade and cooperation, or to learn from companies in other parts of the world.

For the participants of the training, it will also mean to learn about other cultures and to learn about other models of the world.

This is also an important part of the shaping competences (de Haan & Harenberg, 1999). We use the set of five core areas according to (Holzbaur, Venus & Bühr, 2013). Global learning is linked to these competences:

(1) Ethics: competence to deal with other people's and groups' values. It includes the awareness of intercultural competence and global justice.

(2) Knowledge: competence to acquire and integrate new knowledge about other countries and the risks and chances for sustainable development and justice.

(3) Planning: competence to plan in a globalized context.

(4) Action: competence to implement plans and to participate in decision processes on a local, global and glocal (local action with global focus) level.

(5) Reflection: competence to analyse and reflect processes in global worlds and in different cultural contexts.

### **2.4 Values and Sustainability**

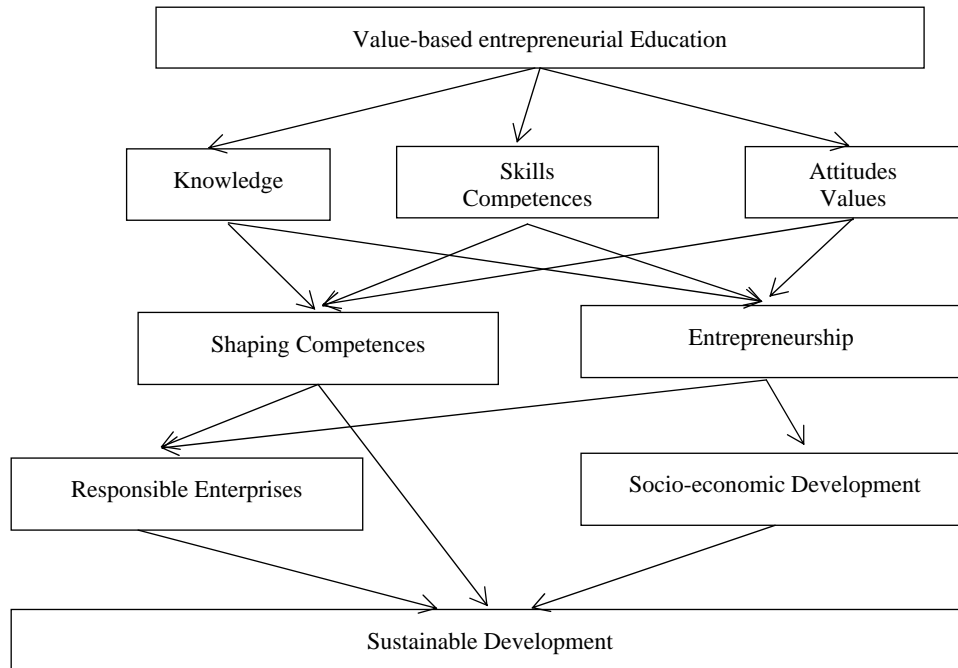
The core idea for defining the levels for the educational game and to integrate the necessary educational concepts and entrepreneurial aspects was the use of values for each level.

Values play an important role in education and in economics and the concept of values is also important for education for sustainable development.

Although the concept of ethical values differs from the concepts of economic value, there is a common basis which we use for the game. We call the game value-based since all six levels refer to one dedicated aspect of value.

Values can then be linked with entrepreneurial values and with education for sustainable development. In

summary, there are various tracks of influence from the concept of the value-based educational game to Sustainable Development.



**Figure 1 Impact of Value-based Entrepreneurial Education on Sustainable Development**

### 3. From Entrepreneurship to Global Learning

The project plan for development, deployment and evaluation of the game and first experiences with the rollout were described in Holzbaaur, Hübner, Agbobli & Fichardt (2015) and Holzbaaur, Strydom & Agbobli (2015).

Here we concentrate on the additional issues to integrate Global Learning.

#### 3.1 Concept

The concept development started in 2004 with a discussion in a community development project of CUT. The basis was a statement of the trainers, that their trainees had learned much about sewing cushions and clothes but that they had no idea what to charge for the products. From this, the idea of a training system for basic economic skills emerged. From the analysis of the potential methods, the idea of an educational game emerged.

The idea of developing and implementing a game set for socio-economic and sustainable development was based on the concept and the interaction between universities and society in transdisciplinary research projects (Schneidewind, 2013). Several game components were implemented and improved by student teams who cooperate with various stakeholders, organise workshops, use the games for trainings, develop additional components, and evaluate the outcomes.

The basic game Micro-Eco-Nomy (Vogelgsang, 2008) has been developed at HSAA based on the author's concepts and was designed for education in schools and in emerging countries. This game is concentrating on basic economic knowledge, and also covers elementary bookkeeping concepts for people without or with little previous knowledge. This constituted the basic knowledge needed to run an enterprise but also the elementary economic knowledge needed by everybody.

The cooperation with the CUT management faculty on the aspect of using educational games to foster entrepreneurship and contribute to socio-economic development has led to the conceptualization of the game and the integration with entrepreneurship education (van den Berg et al., 2009; van den Berg, 2011).

Another development and test step took place in the Philippines: after a student's project thesis on the educational game Micro-Eco-Nomy, she decided to do a training session during her visit in a small Philippine village. The game was assessed positively and some ideas about micro funding also emanated from these activities (Bühr & Rey, 2011).

### **3.2 Aims and Scope**

In the course of the project, several core issues have been identified:

- The game should give the target group the necessary basic knowledge and competences and the skills and motivation for entrepreneurship.
- The system concept and game description should be accessible for everybody.
- The game boards and materials should be developed in a way to allow distribution and deployment virtually without costs.
- The training units should be developed to be used in a huge variety of contexts; primarily concentrating on the deployment for South African communities and with future entrepreneurs,
- The training units should be general enough to be modified and adapted to match the needs of dedicated target groups such as children, entrepreneurs, students or unemployed people.
- The game should support the goals of sustainable development locally and globally. They should rather support the understanding of the tragedy of the commons than support greediness.

The long term result shall be an improved economic situation in South Africa. Outcomes should be the educational game and the trainings. Deliverables comprise:

- Game description and templates for game boards and materials,
- Materials for the trainers and for train the trainers seminars,
- Reports and publications.

### **3.3 Target Groups**

The project has several overlapping phases: development, deployment, training, evaluation, and improvement; in the overall project several target groups and stakeholders must be considered. These groups and their roles could be identified throughout the discussions. We differentiated these stakeholders according to their interest and activities and grouped them into six tiers:

- T0: Responsible bodies for the development or adaption of the educational game.
- T1: Sponsoring partners as funding bodies for the game development (T0) and deployment (T2).
- T2: Responsible bodies for the deployment of the educational game. They will organize the training (T4) within their area of responsibility (T3).
- T3: Participating organizations for the training. These are the direct partners for the trainees (T) and the trainers (T4).
- T4: Trainers for the training.
- T: Participants in the training.

For the training, several target groups (T) could be identified.

- Unemployed people to give them the skills and the motivation to start a business,

- Active entrepreneurs such as craftsmen and traders, small scale farmers, and small business owners in tourism, hospitality, trade, spaza shops ...
- Potential entrepreneurs who already have a business idea e.g. engineers with an invention or innovation that could be commercialized,
- Senior students and academics that should be motivated and qualified towards entrepreneurship,
- Learners in secondary education and junior students in general training,
- People in a situation of change, e.g. immigrants, who need to adapt to their new economic context.

### **3.4 (Inter)Cultural Aspects and Global Citizenship**

From the beginning, it was clear that the basic game Micro-Eco-Nomy and the game system VAL-U should be used in a variety of cultural contexts. Hence, already Vogelgsang (2008) focussed on the cultural aspects of the game.

In the context of the project for game development and deployment, (inter)cultural aspects have to be considered from several perspectives:

- Intercultural competence as a subject for the trainees. They are the future entrepreneurs who have to deal with customers, employees, and other stakeholders with various cultural backgrounds.
- Intercultural competence as a requirement for the development of the educational games with respect to trainees and trainers.
- Intercultural competence and cultural issues as a component of the training manuals and of the training for the trainers on all levels to allow them to address, respect and reflect intercultural challenges within the training.

These cultural aspects comprise:

- The concept of ethnicity since the cultural differentiation of populations, “has great influence on entrepreneurship” (Arko-Achemfuor & Dzansi, 2014);
- Intercultural Communication, e.g., meanings of terms in different cultural contexts like for instance the divers orientation towards cooperation and competition, learning and playing, and divers relations to terms like win, loss and risk;
- Organizational culture, e.g., the common values of an enterprise or training organization (Schein, 2010);
- Intercultural Competences, e.g., self-reflexivity: getting conscious about your own culture in order to be able to handle with other cultures;
- Global learning in order to create Global Citizenship amongst the trainees.

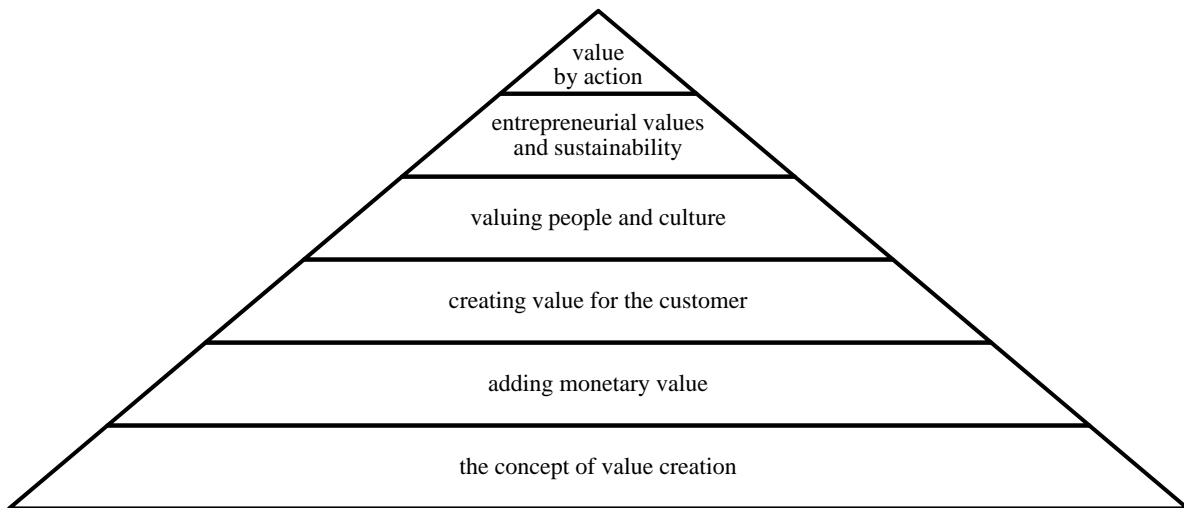
Within the implementation phase, global learning was also considered to be an integral component of the process. Learners from Germany and South Africa were involved into the trainings.

## **4. Game Concept and Components**

The core concept of the educational system was to foster entrepreneurship and to create value for society. In order to give the game an adequate structure, six levels have been defined and for each level, a dedicated concept of values was identified as a starting point. For each level and corresponding values and skills, adequate training methods and matching educational methods such as games have been developed.

### **4.1 Values and Skills**

The concept of the game set is visualized in Figure 2.



**Figure 2 Values and Levels**

#### 4.2 VAL-U overall Structure and Global Issues

The educational game “VAL-U” covers six training levels. For each level, training runs through several business periods depending on the educational demand. Furthermore it is possible that these periods can be interwoven with theoretical lessons and practical training. The various levels are related to the subjects of economics education as shown in Table 1:

**Table 1 Levels, Values and Global Aspects in the VAL-U Game**

Level	value aspect	Global Aspects
6	adding value to society	entrepreneurial thinking and internationality
5	entrepreneurial values ethical values	sustainable development global citizenship
4	valuing people and culture	intercultural aspects global learning
3	creating value for the market	international market — fair trade, global sourcing creating value from cultural ideas and sustainability
2	adding monetary value	value creation abroad and inland
1	the concept of value creation	global value chains

#### 4.3 Level 1: Economic Value Creation

The first level of VAL-U explains the concept of a business. The goal of this game is to introduce the players into the fundamentals of economics.

Level 1 is a reduced version of the Micro-Eco-Nomy game. The game is based on a very simple board layout. Various materials can be used to visualize the process of procurement, production and sales. For this simulation, we can use natural materials (pebbles, wood, etc.), LEGO® bricks, dedicated gaming materials (bought from the shelf or dedicated 3D-printed figures), or everyday materials (screws, nuts, coins, toys). For the trainings in Bloemfontein, we decided to use screws and nuts to simulate the production process. For the money, also natural materials or small pieces of paper or metal foil (e.g., from waste material) can be used. For the trainings in Bloemfontein, we used coins (5 cent) that are no longer in use in South Africa.

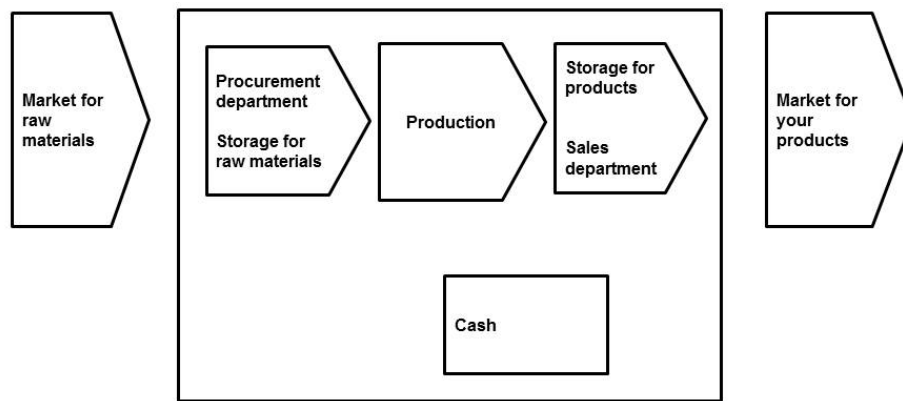


Figure 3 VAL-U Board

#### 4.4 Level 2: Monetary Value: Accounting and Bookkeeping

Level 2 leads from the cash flow account to the profit and loss account and to the balance sheet. While the elementary concept of bookkeeping is also part of level 1, more sophisticated issues of accounting have been extracted from the initial game Micro-Eco-Nomy and are implemented as a separate level. The game uses a similar board layout and introduces the cost structure of a business.

#### 4.5 Level 3: Marketing

Based on the Micro-Eco-Nomy board, the market will be introduced in level 3. The issue of value creation for the customer and for society is also the core question in (Osterwalder & Pigneur, 2010, p. 21): “For whom are we creating Value?” Here, we consider questions of needs and demand. Pricing and the influences on the price will be addressed using the mechanisms from level 1. Other marketing issues like product properties and added value, market research, promotion and communication, distribution and cooperation will be addressed throughout the game.

On that level, trainees will also be challenged to think about their own business idea and on the potential value it can create for the customers. They will also think about the global market and its impact, e.g., the usage of fair trade concepts or other green business strategies (Hart, 1997).

#### 4.6 Level 4: Management

Games on this level will address the planning and managerial aspects of entrepreneurship.

Here we also address the entrepreneurial skills and attitudes, intercultural education and shaping competences.

Games will assess and develop managerial skills and entrepreneurial attitudes as well as planning skills, communication skills, team work and leadership. The games will also allow the trainees to reflect in their own skills and attitudes. There will be dedicated games for intercultural skills and competences.

#### 4.7 Level 5: Strategy and Sustainability

This level addresses long-term planning for the company (strategic planning) and globally (sustainable development). It uses several games.

There will be a role based game similar to Albuch Mühle (Holzbaur, 2001) and Albuch Event (Holzbaur, 2015).

There is also one game that addresses the tragedy of the commons. A simulation game shows the effects and consequences of an unrestricted and egoistic use of common goods which is one of the main reasons for



non-sustainable development.

#### **4.8 Level 6: Business Plan**

In the final role based game, the participants will run their own existing business or their own business idea with their already acquired business knowledge economically in the game. The planned steps of their own existing business or their own business idea can be tested in reality and without risk.

This level integrates the former levels and uses their results (e.g., on marketing, finance, skills and planning) to create a business plan. A business plan structure is provided and the players will develop their own business plan. This can be based on the Business Model Canvas developed by Osterwalder & Pigneur (2010).

The students will also be challenged to think about global aspects by questions like “How can our business benefit from Global Issues?” and “How can our business support Global Sustainable Development?”

After passing the six levels of the game, participants are able to create their own business plan and to start their own business.

### **5. Rollout and Training Manual**

Several training sessions with level 1 in South Africa showed the advantages of the game but also some ideas for improvement.

For all levels, the educational games and descriptions have been provided by groups of professors and lecturers at CUT. At present, a manual for the training and for training the trainers is compiled in cooperation between HSAA and CUT. Educational aspects, intercultural competences and global learning will be included in each level, but will also be addressed in dedicated chapters in the manual.

### **6. Conclusion**

The educational game integrates business education with education for sustainable development in order to build up a generation of responsible and successful entrepreneurs.

The game can be adapted to various target groups and educational focuses:

- Economic education
- Entrepreneurial Education
- Global Citizenship  
for
- Schools and universities
- Entrepreneurs, business owners, employees
- Future entrepreneurs  
in
- Developed countries
- Developing countries
- Underdeveloped countries

The concept has been taken further to a game and project plan which will be implemented and evaluated. Educational games can be a contribution to socio-economic development and to education for sustainable development.

## Acknowledgement

The work described in this paper was done in co-operation and is based on discussions and interviews with many professors, staff members and students at Aalen University, CUT Bloemfontein and other universities in Southern Africa and Germany as well as businessmen and representatives in Germany and South Africa.

A special word of thanks must be given to those students at HSAA who implemented and improved game components as part of their study projects, and to staff and students at CUT who added and improved game components in the framework of the project and in the training workshops.

The project was supported in 2015 by the Baden-Württemberg department of Science in the programme “campusWELTbewerb” for global sustainability at universities.

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