Using a Computer-based Model for Developing Business Students' Skills: Case Study on the Regional Application of the Model

ANDREEA ZAMFIR, ION PLUMB
Faculty of Management
Academy of Economic Studies Bucharest
6, Piata Romana, RO 010374, Bucharest
ROMANIA
zamfir_andreea_ileana@yahoo.com, www.ase.ro

Abstract: Learning ability and innovations making are considered key factors of the regional development within the knowledge-based economy. Furthermore, the use of computers in business education has gained a growing attention in most universities and has changed the educational practices. Therefore, the aim of this study is to reveal recent research focused on the use of computers in business education. The paper discloses a computer-based model for developing the skills of business students and emphasises a case study regarding the applicability of the model in regional context. Moreover, the results of using the model from the point of view of the students are presented. The findings of this study may be helpful for upcoming research in the area of using computers in business education in order to produce new attractive ways of learning for the future knowledge employees from the knowledge regions.

Key words: business, education, knowledge, regional development, computer-based model, students' skills.

1. Introduction

Within the knowledge-based economy there is a strong correlation between knowledge, education, information and communication technologies, economic growth and regional development. The new economic growth models are connected to other more dynamic factors, as: human capital, knowledge, innovation and entrepreneurship. Innovation, knowledge and innovation capacity are essential elements in achieving the regional sustainable development [1]. Geographic position and natural resources are not key concurrence advantages anymore, because knowledge and abilities of employees are becoming key factors for success [2]. As future employees are school's "products", universities everywhere are being forced to carefully reconsider their role in society and to evaluate the relationships with their various constituencies, stakeholders and communities. Furthermore, universities are increasingly expected to engage in interactions with industrial and regional partners [3].

Today, the computers keep their stable position in the educational systems of all developed countries [4]. The computers are used in many areas, including in education, from the elementary school to the universities [5], [6]. The use of computers is reflected in the learning content, methods, forms and principles applied in the process of instruction in educational institutions of all types and levels [4].

In this respect, after emphasising the role of knowledge, education and computers in regional development, we have briefly described in this study a proposed and applied computer-based model for developing students' skills, which reflects the interrelation between knowledge, people and networks. Secondly, we have disclosed a case study resulted from the application of the model with students from two different regions of Romania. Thirdly, we have revealed the results of using the model from the point of view of the students. This study is the result of some years of authors' personal experience in teaching Management for Romanian students and using computers in order to develop the skills needed by the students for their future professional economic and/or managerial activities within the knowledge-based society and economy.

2. Role of knowledge, education and computers in regional development

The issue of the knowledge-based economy in the regional context is a highly debated topic nowadays. The persistent durability of regional successes (and failures), as well as of the digital divides, suggest that only the knowledge regions may be good "hosts" to the (networked) knowledge-based economy [7]. Moreover, learning ability and innovations making are considered key factors of

the regional development in institutional economics [8]. In this context, universities can have the largest impact on regional economic growth by excelling in advanced research and by augmenting the region's stock of human capital [9]. Under the regional development, the innovative process is more important than innovation production, because it potent the human capital. The innovation, learning and development partnership (figure 1, adapted from [1]) is functioning under a transition process of transforming knowledge into inter and intra organisational context [1].

Fig. 1 **Regional development partnership**

Cooperation between universities and businesses has a number of subsets, of which the most important are: key competences/skills of graduates, student entrepreneurship, knowledge transfer, private investment in tertiary education, innovation development, and use of young people's knowledge [3]. Therefore, developing the ability to search information, to process, store and apply it has become a key competence in the process of changing the paradigm of education [4]. The globalization phenomena have opened the doors to the information's access and to removing the barriers made by financial problems or by distance between researchers [10]. Now it is required from education to be open, flexible and capable to follow and respond to scientific, social, technological and economic changes, and also to create changes which will serve to humankind development [2].

Living, learning and working within the knowledge-based society requires specific skills, such as creativity, innovation, communication and collaboration. Flexible form of schooling, more complete development of abilities, critical thinking, interests, motivations for further schooling and creative potential is the real goal [2] for the educational system. Students should have the opportunities to work collaboratively with electronic knowledge-creation tools in their learning process to enhance their learning. When students are encouraged to externalise their mental schemas and clearly communicate their understanding of the interconnectedness of ideas verbally and graphically, then student-designers are effectively engaged in productive, reflective, creative practices [11]. Also, the new approaches to problem solving can be essential to the business world [3].

In this context, applying a learning-oriented approach is a must and it has to consider the cognitive style of the learners within the knowledge-based society. They are intensely using new technologies such as computers, internet, cell phones, etc. [12]. For young people using modern technology is not only an opportunity, but, in the same time, is a way of living because of the possibility to communicate, to be informed about the news, and to have access to the research results [10]. Moreover, the students within the knowledge-based society find modern technology very useful when they search for things of their own interest [13]. Thus, the traditional teaching methods no longer match the current student's needs and behaviour. Teachers may adjust their pedagogical approach to the students and create new learning environments supported by new technologies [14].

By using computers in education the students may interact with virtual environment, this method being preferred in comparison with lecturing of a classic material [15]. However, implementing multimedia in the process of instruction does not mean removing all traditional methods, forms and didactic means [4]. Formal lectures should be supplemented by compulsory reading, handouts, elements of small group teaching and formative assessment [16]. Teachers could integrate into their teaching activity technological tools which promote interaction and critical thinking among students. In this context it is essential that academic freedom (to think) for students in the classroom to be ensured. The professor has the primary responsibility for maintaining a classroom environment in which students are comfortable giving expression to their views and for assisting students in the development of their critical thinking skills [17]. If students experience the classroom as a caring, supportive place where there is a sense of belonging and everyone is valued and respected, they will tend to participate more in the process of learning [16].

Using computers in teaching activity leads to an increase in the learning productivity because the necessary information is faster and accurate obtained, processed and send, by eliminating unnecessary time delay. This way the student receives some information which is inaccessible otherwise: dynamic diagrams, moving images, sounds [15]. As a result, by using computer assisted learning, the efficiency of learning is increased [6].

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3. Using a computer-based model for developing students' skills

In this part of the study we will emphasize how can practically be developed the students' skills for the knowledge-based economy. Thus, firstly we will briefly describe a possible teaching and learning model based on a multi-session approach that we have constructed and applied with students in order to develop their creative and critical thinking skills. Secondly, we will disclose a case study resulted from the application of the model with students from two different regions of Romania. Thirdly, we will reveal the results of using the model from the point of view of the students, derived from the analysis of the empirical data collected during the class through personal observation and questionnaire.

3.1. Overview of the computer-based model

The model is based on a multi-session approach in which the first working session is dedicated to developing students' creative thinking skills, the second working session is dedicated to developing students' critical thinking skills, and the next working sessions may reiterate the whole process.
The necessary resources and outcomes for the teaching-learning process are presented in figure 2.

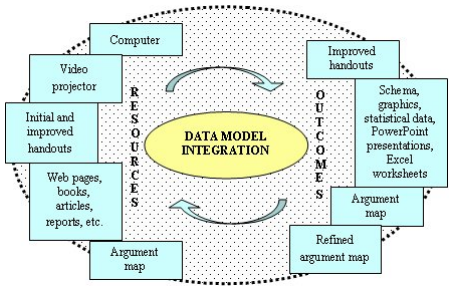

Fig. 2 **Data model integration**

Within the first working session dedicated to developing students' creative thinking skills the teacher introduces the subject for discussion to the students, asking them to use their creativity in order to find solutions to the problem. The students think about the problem and write-down their ideas first individually and then in small groups. The teacher supervises the groups and possibly gives supplementary explanations to help the students. Next, the ideas are introduced into the computer, and the teacher and the students communicate and cooperate in order to combine ideas in different ways. Also, they choose a single idea which they most like. At the end of the activity the teacher will draw conclusions (will provide feedback about the creativity of the students). Also, the teacher will ask the students: (1) to consider the ideas generated together, to try to (re)combine them and to send their handouts to him/her by E-mail; (2) to try to find evidence related to the chosen idea; and (3) to share the evidence they found. Furthermore, the teacher will send to the students by E-mail the synthesis of the ideas generated into the classroom.
Within the second working session dedicated to developing students' critical thinking skills the teacher reminds to the students what the idea they chose in the previous session was, asking them to analyze it. This means that they will identify the premises, the arguments and counter-arguments and together will draw the argument map and will evaluate the logical strengths of arguments. The teacher will draw conclusions at the end of the activity and will send the argument map to the students by E-mail. Furthermore, the argument map will be refined (improved) both by teacher and students and they will further collaborate virtually for developing new ideas [18].
The mentioned listings are neither exclusive nor exhaustive and are drawn from our personal experience as teachers. A successful classroom experience can only be attained if both teacher and students work together, and if the teacher acts as a facilitator for the students' skills development.

3.2. Case study regarding the regional application of the computer-based model

The model was applied with the students in the third year of the first cycle of studies, distance learning, from the Faculty of Management of the Bucharest Academy of Economic Studies, in two territorial centres that are Bucharest and Piatra Neamt. These territorial centres are situated in two different regions of Romania, and therefore the students cannot physically meet and collaborate (see figure 3).

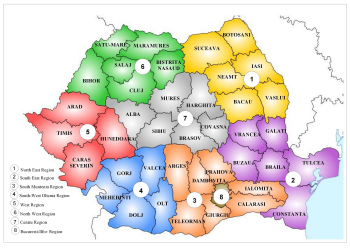

Fig. 3 **Development regions in Romania** [19]

The subject chosen by the teacher for discussion was to analyze the statement "Renewable energy may help the development of the region you live in" in order to improve students' creative and critical thinking skills. The students have identified the premises, the arguments and counter-arguments

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and together with the teacher have drawn the argument map (figure 4) and have evaluated the logical strengths of arguments.

In this particular case the activities have been divided in three sessions: (1) firstly, each group of students from Bucharest and Piatra Neamt have drawn an argument map and have refined it; (2) secondly, the teacher has presented to the students the map drawn by their colleagues from the other city and based on this, new ideas were generated; and (3) thirdly, a common argument map (figure 4) resulted from the mixture of the two argument maps designed by the students from Bucharest and Piatra Neamt.

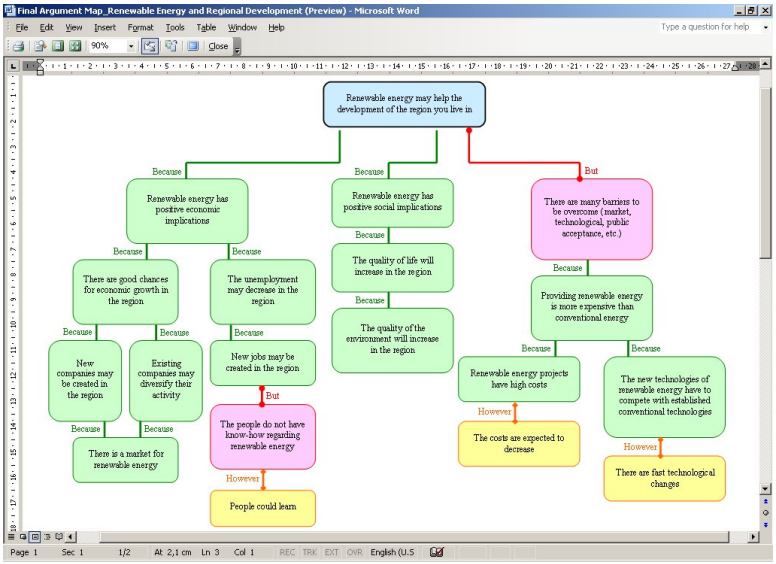

Fig. 4 **Argument map regarding renewable energy and regional development resulted from class activity**

3.3. Results of using the computer-based model in regional context

In the end of the third session a questionnaire was used in order to reveal students' opinion regarding the didactic activity that has been done. The questionnaire used was construed based on a five-level Likert scale of increasing intensity where 1 indicates strongly disagree (very badly) and 5 designates strongly agree (very good). The questions used to find out the students' opinion about the didactic activity they have been completed and the average values (scores) of the responses of students from the two territorial centres for each question are presented in table 1 and compared in figure 5.

According to the performed study, the students from Bucharest obtained a total average score of 4.34, which represents a high degree of agreement, meaning that they appreciated as favourable this type of class activity. As for the students from Piatra Neamt, the situation is not as good as for the students from Bucharest, and the average score obtained is of 4.07.

No	Question	Average scores	
		Bucharest	Piatra Neamt
1.	Is this type of class activity easy to be done (accomplished)?	4.23	4.52
2.	Is this type of activity useful to you in the process of learning?	3.77	4.71
3.	Has this activity improved your communication skills?	4.28	4.26
4.	Has this activity improved your teamwork skills?	4.17	4.23
5.	Has this activity improved your creative thinking skills?	3.98	3.86
6.	Has this activity improved your critical thinking skills?	4.54	4.47
7.	To what extent the Internet helped you to accomplish this activity?	4.82	2.93
8.	To what extent have you used E-mail to communicate with your teacher and/or with your colleagues?	4.79	2.85
9.	To what extent have you been motivated to learn more about the subject discussed?	4.27	4.11
10.	Have you enjoyed this activity?	4.54	4.76
Total average score		**4.34**	**4.07**

Table 1 Average scores obtained

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Generally, while the average scores obtained by the students from Bucharest vary between 3.77 (for the question "Is this type of activity useful to you in the process of learning?") and 4.82 (for the question "To what extent the Internet helped you to accomplish this activity?"), the scores for those from Piatra Neamt have a range between 2.85 (for the question "To what extent have you used E-mail to communicate with your teacher and/or with your colleagues?") and 4.76 (for the question "Have you enjoyed this activity?").

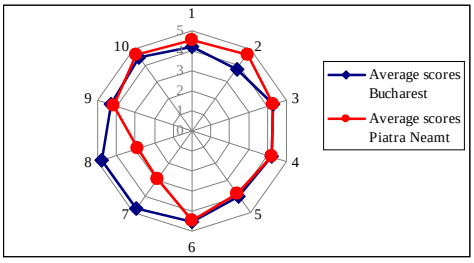

Fig. 5 **Average scores of the responses**

Regarding the use of Internet and E-mail in accomplishing the activity there are high scores for the students from Bucharest and low scores for those from Piatra Neamt. The explanation for this situation is that nearly all of students from Bucharest have Internet connexion at home, while most students from Piatra Neamt have Internet connexion only at their work place or they have no Internet connexion.

By analysing the average scores obtained we can conclude that applying the computer-based model in regional context has proved to bring substantial benefits both for students from Bucharest and Piatra Neamt: they appreciate as "good" the degree of simplicity; they believe that this activity has improved their communication skills, teamwork skills, creative thinking skills, and critical thinking skills; they were motivated to learn more about the subject. If the students are enjoying the activity, they appreciate that it is easy to be accomplished and is also useful.

4. Conclusions

Within the knowledge-based economy there is a strong correlation between knowledge, education, information and communication technologies, economic growth and regional development. Consequently, we have briefly described in this study a computer-based model for developing students' skills and we have emphasised a case study regarding the applicability of the model in regional context. Moreover, we have revealed the results of using the model from the point of view of the students, derived from the analysis of the empirical data collected during the class through personal observation and questionnaire.

The main conclusions of this study may be summarized as follows: the model supports teamwork as well as individual thinking and learning; it could be used to produce class experiences which support collaborative learning; using the model enhances the teaching and also seems highly motivating and makes the class activity enjoyable for students; and using the model lead to the development communication, teamwork, creative and critical thinking skills of students. If students are educated to apply knowledge to knowledge in the process of learning as well as in day-to-day life, then this process will became habitual, and their permanent need for knowledge will be encouraged and developed. Thus they will become knowledge employees that will enhance the development of the knowledge regions in which they live in.

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