DEVELOPING STUDENTS' SKILLS FOR THE KNOWLEDGE SOCIETY

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Abstract: *This study explores the manner in which students' skills for the knowledge society could be developed. Our conclusion justifies the effort invested in designing new methods of developing students' skills needed within the knowledge society. It has been concluded that information and communication technology creates a vast opportunity to improve the skills and competences needed within the knowledge society. The study was conducted using the knowledge base built up through research of literature and national experiences in developing students' skills for the knowledge society.*
Keywords: knowledge society, skills, competences, information and communication technology.
JEL Classification: A_{23}, I_{20}, L_{86}, M_{10}, O_{30}.

1. Introduction

This study investigates how the skills for the knowledge society could be better developed nowadays. The new configuration of society, in which knowledge is the main asset, requires new competences and skills for people working, learning, thinking and creating in this society. The competences and skills needed within the knowledge-based society are subject to rapid change, as are the organizations involved in developing them.

We consider that the skills and competences for the knowledge-based society could be developed by using information and communication technology. The study is based on evidence provided by a set of policy documents (regulations, position papers, etc.), as well as articles and research reports. Analyzing and evaluating evidence and interpreting and reorganizing concepts answered the research question. Answering the

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research question was difficult, due to the variety of approaches, concepts, definitions, criteria, and classifications employed.

2. Competences and skills needed within the knowledge society

People's competences and skills needed for their activities within the knowledge-based society constitute a highly debated topic nowadays. The knowledge-based society offers many potential benefits as well as challenges in this area. People have vast new opportunities in terms of communication, travel and employment, but taking advantage of these opportunities, and actively participating in society, requires knowledge and competences. Simultaneously, competitive advantage is increasingly dependent on investment in human capital, thus knowledge and competences is a powerful engine for economic growth (European Commission, 2001). Given the current uncertain economic climate, investing in people becomes all the more important.

The task of defining basic skills or key competences for the knowledge society has in recent years engaged many working groups at global, European and national levels. The finding to this point is a better definition of significant competences for successful participation in the knowledge-based society. However, according to OLCOS (2007), the understanding of how such competences should preferably be developed in learning processes is much less consolidated.

The term "competence" could be defined as a combination of knowledge, skills and attitudes appropriate to a particular situation (European Commission, 2005, p. 3). There are eight domains of competences that are necessary for personal fulfilment and development throughout life, active citizenship and inclusion, and employability. These domains of competences identified by the European Commission (2005) are the following: (1) *communication in the mother tongue*, which is the ability to express and interpret thoughts, feelings and facts in both oral and written form (listening, speaking, reading and writing), and to interact linguistically in an appropriate way in the full range of societal and cultural contexts (education and training, work, home and leisure) (p. 13); (2) *communication in a foreign language*, based on the ability to understand, express and interpret thoughts, feelings and facts in both oral and written form in an appropriate range of societal contexts according to one's wants or needs. It also calls for skills such as mediation

and intercultural understanding (p. 14); (3) *mathematical competence (literacy) and basic competences in science and technology*: the first means the ability to use addition, subtraction, multiplication, division and ratios in mental and written computation to solve a range of problems in everyday situations. It involves the ability and willingness to use mathematical modes of thought (logical and spatial thinking) and presentation (formulas, models, constructs, graphs/charts). The emphasis is on process and activity, as well as knowledge; the latter refers to the ability and willingness to use the body of knowledge (p. 15); (4) *digital competence* involves the confident and critical use of information and communication technology for work, leisure and communication. It is underpinned by basic skills in information and communication technology, such as the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet (p. 16); (5) *learning-to-learn* is the ability to pursue and persist in learning. People should be able to organise their own learning, including through effective management of time and information, both individually and in groups. Competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to handle obstacles in order to learn successfully. Learning-to-learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in several contexts thus motivation and confidence are crucial to an individual's competence (p. 16); (6) *interpersonal, intercultural and social competences, civic competence* cover all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life, and to solve conflict where necessary. Civic competence equips individuals to fully participate in civic life, based on knowledge of social and political concepts and structures and a commitment to active and democratic participation (p. 17); (7) *entrepreneurship* refers to an individual's ability to turn ideas into action. It comprises creativity, innovation, risk taking, and the ability to plan and manage projects to achieve objectives (p. 18); and (8) *cultural expression* is the appreciation of the importance of the ideas', experiences' and emotions' creative expression in a media array, including music, performing arts, literature, and the visual arts (p. 19).

According to the European Commission (2003, p. 21), key skills and personal attributes relevant to human capital may be conceptualised as follows: *communication, numeracy, intra-personal skills* (motivation/

perseverance, learning to learn and self-discipline, capacity to make judgements based on a relevant set of ethical values and goals in life); *inter-personal skills* (teamwork, leadership); *other skills and attributes* (facility in using information and communication technology, tacit knowledge, problem solving, physical attributes and dexterity).

The internalization of the competences and skills needed within the knowledge-based society depend on the admittance of the learner's autonomy, personal mastery and self-direction on one hand, and on the implementation of innovative approaches that foster self-management, communication and team skills, and analytical, conceptual, creative and problem solving skills on the other hand (OLCOS, 2007).

The competences and skills needed within the knowledge-based society are subject to rapid change, as well as are the organizations involved in developing them. The manner in which people access information and services is changing and consequently, the knowledge, skills and attitudes that everyone needs (human capital) are changing. Moreover, the globalization phenomenon affects the world of work, with rapid and frequent change, with the introduction of new information and communication technologies and new approaches to organizing companies (greater personal responsibility and autonomy). Therefore, employees need both to update specific job-related skills and to acquire generic competences that allow them to adapt to change and this leads to increasing demand for learning (European Commission, 2003; European Commission, 2005).

In this context, educational organizations are playing a key role in raising the level of knowledge, skills and competences within the knowledge-based society. However, there is a huge difference between identifying required competences and skills and developing them at different educational levels (OLCOS, 2007). In order to acquire the competences and skills needed within the knowledge-based society, educational organizations themselves must become "learning organizations" (Senge, P. M., 2006, p. 11) or "learning companies" (Pedler, M. et al., 1991). This implies developing and maintaining an environment that favours innovation and change of established educational frameworks and practices. Nevertheless a major problem in becoming a "learning organisation" is the internal organization of most educational institutions. It usually follows a model of "professional bureaucracy" (Mintzberg, H., 1983), in which an administrative and collegial apparatus ensures that the

teachers can do their job, but requires little collaboration between them. The prevailing principles are collegiate democracy and consensus, and professionals conduct their work as long as they do not violate these established principles and practices. Professional bureaucracies are structures for performance rather than structures for innovation. In these structures the resistance to change is more noticeable. Therefore, educational practices could give priority to learners' own explorative, constructive and communicative activities, instead of a teacher-centred knowledge transfer model of education, in order to acquire the competences and skills required for the knowledge-based society (OLCOS, 2007).

The skills for using personal computers and Internet access are definitely essential within the knowledge-based society and should be possessed by the highest number of people belonging to different groups in society (European Commission, 2003). Hence, Internet searches, word-processing, and multimedia presentations are increasingly being adopted in the educational process. The teacher's ability to design the types of activities that effectively apply collaborative inquiry to electronic learning tasks for deepening student knowledge is vital, whatever the subject area, student age or software choices (Kimber, K. et al., 2007, p. 59-79). The core students' skills that should be developed are the ability of creative thinking, team-task solving, system of thinking, business decision-making, the ability of both gaining and distributing correct information in correct time and place, to make use of the advantages of computers and simulations for the exchange of information (Smutný, P. et al., 2008; Baki, A. et al., 2008; Nikishkov, G. P. and Tsuchimoto, T., 2004). Such skills and the continuous updating of skills and competences through lifelong learning will allow people to perform better in their activities within the knowledge-based society.

Information and communication technology creates an opportunity to improve the skills and competences needed within the knowledge-based society. For instance, people who use information and communication technology at the workplace are predisposed to use them for private purposes too, thus leading to skills improvement. Therefore, information and communication technology is a major driver of a pervasive and diversified change, based on the increased ability of people to obtain and process information to create, transmit and manage knowledge (European Commission, 2003, p. 21). One could argue that work in the knowledge-

based society, where information and communication technology has changed the working environment, has evolved in a way that presents risks for the quality of working conditions, e. g. work overload, long working hours and working rhythms incompatible with private life (European Commission, 2005). However, information and communication technology can provide potential benefits to the working environment and to the people themselves, because it allows collaboration between employees, stimulates creativity, and improves decision-making processes.

3. Developing students' skills for the knowledge-based society

Living, learning and working within the knowledge-based society requires specific skills, emphasising on creativity and innovation, as well as on communication and collaboration (Figure 1). Students should be able to demonstrate creative thinking, to construct knowledge as a means of individual or group expression, to use models and simulations to explore complex systems and issues, to interact and collaborate using a variety of digital environments and media in order to support individual learning and contribute to the learning of others (ISTE, 2007). Technologies that support teacher-student and student-student interaction, whether real time or asynchronous, promote and support collaboration and discussion (Yoder, M., 2008, p. 293-298). People have now more diverse and frequent interaction opportunities than they have ever experienced before, due to the development of the Internet and its communication possibilities such as Email, chat, Web discussion forums, etc. (Woo, Y., Reeves, T. C., 2007, p. 15-25). This fact could lead to a better teaching-learning process and also to the creation of new and attractive methods for teaching and learning. Educational process could be improved with communication tools that provide synchronous and asynchronous opportunities for interaction and collaboration. Blogs, podcasts, real time interaction, and virtual worlds could be incorporated in education to create a learning environment that strengthens teaching and motivates learners (Yoder, M., 2008, p. 293-298) so as to gain the skills needed within the knowledge-based society.

In the last few years, there has been a growing understanding of the important role of information and communication technologies in education. Various new models of education are evolving in response to the new opportunities (Barak, M., 2007, p. 30-43) that are becoming available by

integrating new technologies and computer applications into the process of teaching and learning. The new educational model is characterized by the interdependence of communicative interaction, new technologies, the development of computer applications, the design of computer-based tasks and focused activity for learners to become critical thinkers and creators of knowledge (Kimber, K. et al., 2007, p. 59-79).

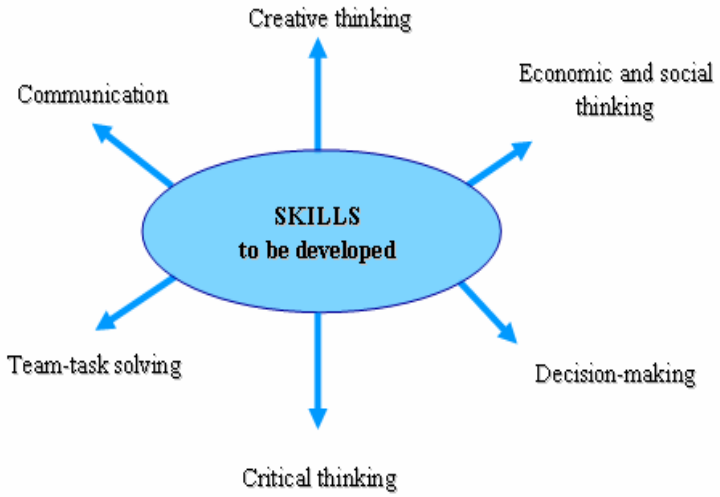
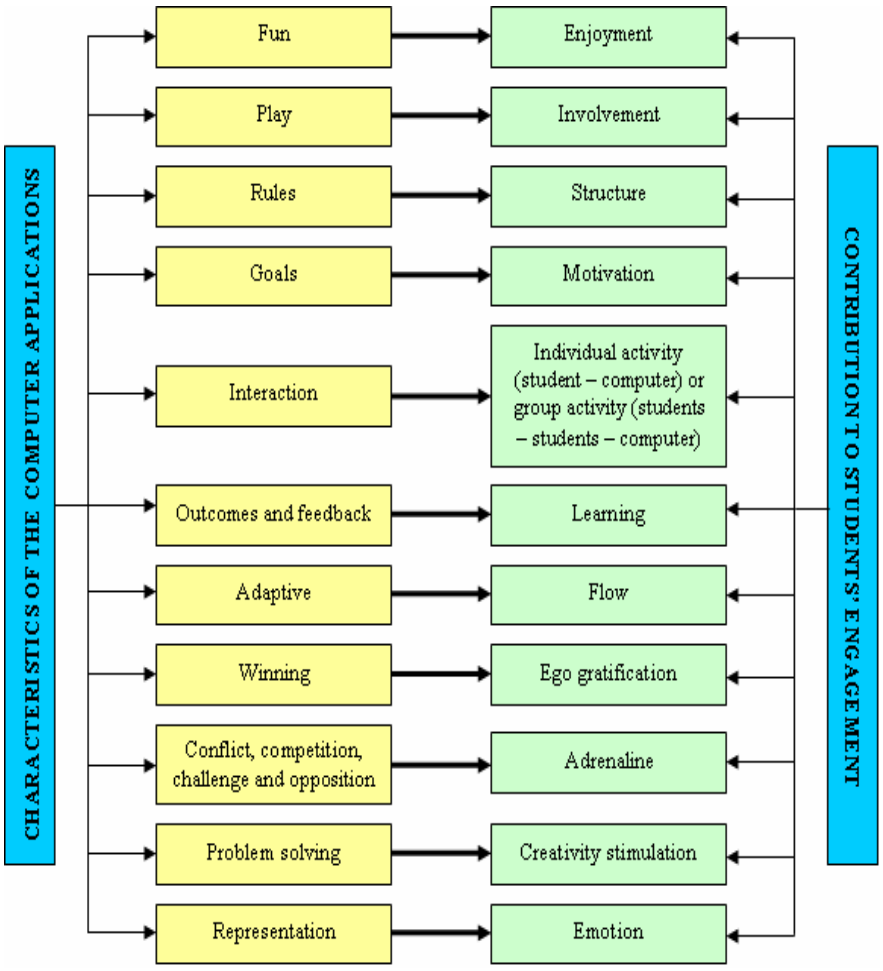


Fig. 1. Skills for the knowledge-based society

Recent educational research from a socio-cognitive perspective has validated students' collaborative engagement with new technologies and heightened understanding of influential factors shaping the effectiveness of peer interactions, learning contexts and computer interfaces for enhancing learning (Kimber, K. et al., 2007). All these changes pose considerable challenges for the educators and business trainers who wish to promote literacy skills (Mitchell, A., Savill-Smith, C., 2004, p. 24-26).

One significant pedagogical approach gaining credence through research and classroom practice is students' collaborative engagement with problem-solving, computer-based tasks for more effective learning (Kimber, K. et al., 2007). There are some characteristics of the computer applications that contribute to the engagement of the students in the process of learning (Mitchell, A., Savill-Smith, C., 2004). Figure 2 reveals which are these characteristics and how could they contribute to the engagement of the

students in the process of learning. Teachers should focus their efforts to ensure that students are given 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 (Kimber, K. et al., 2007).



Source: Zamfir, A., 2008, p. 687.

Fig. 2. Contribution of the computer applications' characteristics to students' engagement in the process of learning

Nowadays educational practices are profoundly changing by integrating information and communication technologies into the process of teaching and learning. Knowledge society and growing demands for highly skilled and educated people are elements that claim for the change of traditional teaching and learning processes. Modern students need to update their knowledge, skills and competences (Beleviciute, I., Sileikiene, I., 2006, p. 108-113). Therefore, teachers should redesign their courses by adopting new educational methods and appropriate technologies to fully exploit the benefits of web-based learning environments (Lee, T. H. et al., 2007, p. 219-225) and computer applications in education (Zamfir, A., 2008, p. 684-688). Although some progress is being made, relatively few authentic web-based learning and lifelong learning programs have been developed and implemented at different levels of education. One type of changes is related to an integration of various kinds of computer-based learning systems as supplements to conventional teaching methods.

Many possibilities are available for using information and communication technology for delivering educational services (e.g. PowerPoint presentations, E-mail, Chat, discussion forums, or special software). Teachers could integrate into their teaching activity technological tools such as computer simulation, which promote interaction and critical thinking among students, and seem highly motivating and make learning enjoyable for students.

4. Conclusions

The new configuration of society, in which knowledge is the main asset, requires new competences and skills for people working, learning, thinking and creating in this society. The competences and skills needed within the knowledge-based society are subject to rapid change, as are the organizations involved in developing them. The manner in which people access information and services is changing, and consequently the knowledge, skills and attitudes that everyone needs (the human capital) are also changing. People need skills such as the capacity for creative thinking, team-task solving, systems thinking, business decision-making, and ability to both gain and distribute accurate information in suitable time and place, and to make use of the advantages of computers and simulations for the exchange of information. The continuous updating of skills and

competences through lifelong learning will allow people to perform better in their activities within the knowledge-based society. Moreover, information and communication technology creates an opportunity to improve the skills and competences needed within the knowledge-based society.

Information and communication technology can provide benefits to the working environment and to the people themselves, because it allows collaboration among employees, stimulates creativity and improves the decision-making process.

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