



Analysis of the competencies and learning outcomes concepts of virtual environments

Análisis de los conceptos de competencias y resultados de aprendizaje de entornos virtuales



Videopresentación

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ABSTRACT

The present article focuses on the presentation of a proposal for the definition of the concepts used in our learning model in virtual environments referred to competencies and learning outcomes, based on an analysis of the existing bibliography in English, Spanish and Russian and the experience accumulated during 7 years of work in this modality.

Keywords: *competencies, learning outcomes, virtual environments*

INTRODUCTION

Today's learners must be active agents of their own learning rather than passive spectators, as they were traditionally, who see themselves as participants in the creation of knowledge, skills and new ideas (Leadbeater, 2008). Learning in the 21st century is based on three pedagogical principles: personalization, participation and productivity (McLoughlin and Lee, 2008). This pedagogical framework allows for learning in real-world contexts and environments, creating projects related to those environments, and solving problems as they arise in real organizations, all of which is a powerful learning strategy that outcomes in the creation of learning communities among students, instructors, educational institution administrative staff, and community members.

The aim of modern education must be to “nurture” the professional and civic potential of the student by considering the formation of his or her abilities towards action in future life and in the face of the social situations he or she will face (Bereczki and Karpati, 2018).

One of the most widely used learning strategies today is competency-based education, along with student-centred learning and problem-solving learning approaches in real-life contexts and project development, which leaves behind the formulation of traditional goal-based learning at pre-established times.

In our case, these learning strategies are developed in virtual environments, which makes it more important to define the concepts being studied for the instructional activity and to accompany the students.

Definitely this new educational strategy, combination of learning environments, is more in line with the current needs and demands of education, however there are still controversial issues such as the definition of competencies and learning outcomes and their interrelationship, used interchangeably by most educational institutions in the United States and other countries, without presenting a clear formulation of these terms or concepts.

PROBLEM STATEMENT

The competency-based education model by combining its principles with earlier models such as the results-based model has been considerably enriched. Both models, competencies and results-based, differ fundamentally in that the former focuses on the mastery of each unit of competence set out in the tasks and/or assignments, mastery that is established through a formative evaluation or in a permanent two-way interaction between the instructor and the student, which requires the demonstration of mastery acquired in the study process, while in the results-based model it occurs in relation to the review of content and only at the end of the course or subject where a summative evaluation is made.

In the competencies model, it is usual for researchers, teachers, and administrative personnel to present the expected learning outcomes of programs in a format of competencies.

In both cases, verbs are used starting from Bloom's Taxonomy and describing both concepts as a set of attributes that include knowledge, skills, attitudes and values. Sometimes they are used interchangeably and sometimes even with different meanings.

The creation of a virtual learning environment is related to a set of activities that involve the creation of learning communities where interaction between the different actors involved in the learning space is generated. This space is known as the Learning Management System and its design is a prerequisite for the planning, organization and implementation of educational processes mediated by technology and the use of communication and networks (García, 2019). This situation requires a clear understanding of the concepts of competence and learning outcomes, which in addition to supporting the design of instruction, supports the activity of the instructor in the processes of effective accompaniment of students.

For more than a decade there has been an attempt to clarify this situation by various authors Kennedy, Haylan, Rian, (2004); Zimnaya, (2004); Moon (2007); Harden, Crosby, Devis, Friedman, (2009); Melton, (2010), (2014); Lobanova and Shunin (2008).

At this point we do not find in the literature a clear way to differentiate the concept of competencies from the concept of learning outcomes.

This article focuses on presenting a proposal for a definition of the different concepts used in our model of learning in virtual environments based on an analysis of the existing literature and the experience accumulated during 7 years of work in this modality.¹

BIBLIOGRAPHIC REVIEW

It is difficult to find a precise definition for the term competence but the concept is very well expressed by Winterton et al. (2005): "A competence is more than knowledge or skills. It is the ability to perform complex tasks, including skills and attitudes in a particular context. (OECD, 2003).

The European Commission's CEDEFOP glossary (Mulder, M., Weigel, T., & Collins, K. 2007) expresses that a competence is the ability to apply learning outcomes in an appropriate way in a defined context (education, work, personal or professional development). The competence is not limited to expressing cognitive elements involving the use of theory, concepts, or tacit knowledge; it also encompasses functional aspects involving technical skills, as well as interpersonal attributes and skills, such as relational, social or organizational abilities, and ethical values.

Brown & Knight (2012), and Adam (2012) express that some educators have a very narrow view of what a competence means, as they associate it only with knowledge acquired through academic training and confuse it with learning outcomes.

On the other hand, the UK Training Agency (Burke, 1989) defines competence in the professional world as the ability to perform the activities within a profession. According to this institution, competence is a broad concept that expresses the ability to transfer skills and knowledge to new situations within the occupational area. It encompasses work organisation and planning, innovation and includes those qualities of personal effectiveness that are required in the workplace to cope with co-workers, managers and clients.

Tobón (2013) proposes to understand competencies from a complex thinking system as performance processes with suitability in certain contexts, integrating different knowledge: knowing how to be, knowing how to do, knowing how to live together, in order to carry out activities and/or solve problems with a sense of challenge, motivation, flexibility, creativity, understanding and entrepreneurship, within a perspective of metacognitive processing, continuous improvement and ethical commitment, with the goal of contributing to personal development, the construction and strengthening of the social fabric, the continuous search for sustainable economic-business development, and the care and protection of the environment and living species.

Le Boterf (2000) argues that competence is not a set of fragmented knowledge, but rather *concerted knowledge that is* not transmitted, but rather the centre of competence is the subject-learner who builds competence from the sequence of learning activities that mobilize multiple skills. For Le Boterf (2000), the competent person is the one who knows how to construct knowledge.

According to Zimnaya the competencies are complex and multifactorial in nature and there are different types for which he proposes the following classification. (Zimnaya, 2010):

Type A" competences are subject to the development of the learning content, as a given social requirement for the educational preparation of the student, demand for the formation of the interconnected qualities of his own personality (knowledge, skills, abilities, values);

The "Type B" Competences: act as a representation of the necessary human qualities (knowledge, skills) that ensure the effectiveness of the outcomes to be obtained and their evaluation. In other words, this type of competence implies: a tangible result, its qualitative and quantitative evaluation, the optimization of the evaluation, the development of normative instruments necessary to assess the mastery of the competence and the creation of conditions for students to organize and be motivated for the development of an independent educational activity;

¹ Humboldt International University is a Florida State University that operates a completely virtual educational modality

Type C” competences refer to an internal and proper “psychic phenomenon”; the visualisation of the result of the actions, the action programme ... which is a prerequisite and the basis for competence formation. In other words, it is an action programme for the design, provision, implementation and motivation, under predetermined conditions in real contexts. The learning content mastered in this way and representing “the image of the knowledge content, the programmes for its implementation, the methods and the algorithms of actions, updated in activity and behaviour - enables the development of the learner’s competences as a manifestation of the personal and intellectually determined motivation of the subject competences of the educational process”.

The term learning outcome is a term coined by Professor John Biggs (1999), which expresses the process of creating an environment that supports appropriate activities to achieve desired outcomes. The word ‘constructive’ refers to what the learner does to construct meaning through relevant learning activities. The “alignment” aspect refers to what the teacher does. The key to alignment is that the components in the teaching system, especially the teaching methods used and the assessment tasks are aligned with the learning activities undertaken in the expected outcomes. Several organizations and authors over the years have offered different approaches to the concept and definition of learning outcomes:

- » Learning outcomes are explicit statements of what we want our students to know, understand and be able to do as a result of completing our courses. (University of New South Wales, Australia)
- » Student learning outcomes are defined in terms of the knowledge, competencies and skills that a student has achieved at the end of (or as a result of) his/her engagement in a particular set of higher education experiences. (Council for Higher Education CHEA, USA)

- » Learning outcomes are statements of what a student is expected to be able to do as a result of the learning activity (Jenkins and Unwin, 2001).
- » A learning outcome is a written statement of what the successful learner is expected to be able to do by the end of the module/subject or qualification. (Adam, 2004)
- » Learning outcomes are statements of what a student is expected to know, understand and/or be able to demonstrate after completing a learning process. Glossary of Tuning Educational Structures
- » The learning outcomes act as
 - » guiding element in the design and learning process.
 - » descriptor of what is intended specifically in a curriculum.
 - » facilitator for the development of evaluation tools and criteria
 - » connecting element with other curricula

DISCUSSION

From all or previously raised we can conclude that the competences, from a constructivist position, whether disciplinary or generic, are developed during the learning process by the student in several courses and are evaluated in each course through the units, modules, or learning objects in a formative way facilitating the construction of them by the instructor.

Competencies represent a dynamic combination of knowledge, skills, attitudes and values. Making students competent is the main objective of educational programmes.

In this sense, the competency-based approach can be carried out from any of the existing pedagogical models, or also from an integration of them.

Before implementing the competency-based approach in a given educational institution, there must be a participatory construction of the learning model within the framework of the institutional educational project. To this end, it is necessary to consider the institutional mission and philosophy regarding which professionals to train, as well as the various contributions of pedagogy, the modality of delivery, the legal references and the organizational culture. This preliminary process constitutes the basis for carrying out the curricular and instructional design by competencies, and guiding the didactic processes and the evaluation of learning.

On the other hand, there is a clear difference between the learning outcomes of the programs and the learning outcomes of the modules, subjects, or courses. The former refer to what the student will be able to do as an integral result of the whole program and can be expressed in terms of the competencies that underpin it.

The learning outcomes of courses, subjects, or modules identify a concrete and measurable learning product that the student (project, analysis, map, comparison chart, article, monograph, essay, report, oral or written presentation, etc.) will be able to achieve at the end of the corresponding academic unit demonstrating whether or not he/she is competent in the development of the same established product.

For example: In a subject of Planning the unit of general competence to be developed by the student should be **planned** and the learning outcome to be achieved the presentation of an elaborated **plan**, which expresses a relationship within the process of development of the competence with the final outcome of it. The level of competence achieved will be determined during the formative assessment developed by the trainer from the use of corresponding assessment instruments.

As we can see the relationship of the competence - learning outcome constitutes a process of demonstration of the student's capabilities that concludes in a product is an interactive process **Plan-Plan, that is why** in our model for clarity the competences (units) are expressed through verbs related to Bloom's taxonomy and learning outcomes are expressed through nouns as a representation of a verifiable product.

A concrete example of a course where the expression of competencies as an action and learning outcomes as a learning product are presented is as follows:

ASB 2019 STRATEGIC PLANNING FOR BUSINESS

I. COMPETENCIES.

The course is focused on competencies for the development of skills for strategic planning and related techniques:

1. Conceptualize the key concepts and the language used in strategic planning and demonstrate understanding of strategic planning as part of the decision-making process.
2. Understand the language of planning well enough to develop and write compelling statements of the vision, mission, goals, objectives, core values and strategy for his/her organization.
3. Distinguish between various models used for strategic planning and learn to select the appropriate ones for his/her organization, as well as learning to apply them.
4. Identify and learn to apply the methods and techniques for strategic planning within the organization and the internal and external social, economic, political, and technological factors that affect the organization. Develop the organization's strategic plan.

II. STUDENTS' LEARNING OUTCOMES (SLO).

At the end of this course the students will be able to:

1. Conceptualization of strategic planning as a tool for decision-making regarding the performance and future of the organization.

2. Formulation of vision, mission, goals, objectives, core values and strategy.
 3. Identification and selection of the appropriate strategic planning models.
 4. Application of the methods and techniques for developing the strategic planning process with the model selected, as well as for the formulation of the strategic plan.
- » Specific conditions: learning outcomes should be specific and focus on an expectation or aspect of understanding and highlight the conditions under which the student is expected to perform the task.
 - » Complex sentences (which can be replaced by simple ones) should be avoided, as should the use of vague terms. The formulation of learning outcomes should be understood by students

The presentation of the units of competence can be done by means of tables where the knowledge, skills, attitudes and values that are expected to be developed are described separately. The competencies will always be presented through verbs since they are only definable in action. Competencies do not reside only in the capacities achieved by the student but in the mobilization of these capacities.

The learning outcomes of the programs are a statement of the results of what the student is expected to be able to do in a complex environment based on the disciplinary and personal competencies developed during the course of the course. They are expressed as noun verbs.


The learning outcomes of the courses or subjects are statements of the products that the student must create to demonstrate that he or she is competent in his or her learning.

To write up the learning outcomes of the programs we consider the following indications:

- » Expected student behavior: it is best to write the learning outcomes in terms of an observable behavioral outcome; essentially, the learning outcomes should provide a description of what the student will be able to do by the end of the program.
- » Learner-centred: all learning outcomes must be learner-centred. An effective learning outcome will explain the expectations for student behavior, performance, or understanding.
- » The writing of learning outcomes must be clearly correlated with learning outcomes in all courses (learning outcomes of curriculum material). In particular, it should be in full and strict conformity with the levels of assimilation of the educational material and with the main stages of the process of knowledge assimilation.
- » Learning outcomes must be described in such a way that they can be truly measured and evaluated. Each training outcome prescribed and indicated in the program must have a system of measurement and evaluation. It is impossible to allow too "general" a formulation of the learning outcome, which may cause difficulties in measuring and evaluating, and too "narrow" a formulation, which will require numerous measurement and evaluation procedures, which is not an indicator of effectiveness
- » The process for achieving learning outcomes, as well as their formulation, must be exactly in line with the time spent on training. When recording a particular learning outcome, it is always necessary to remember the reality of its achievement within the discipline programme studied, taking into account the time allocated for it.

CONCLUSIONS

Summarizing in the model of learning in virtual environments we are considering the following concepts:

1. Competencies are personal qualities that are up-to-date, integrative, knowledge-based, intellectually and socio-culturally conditioned, that are manifested in the activity, the behaviour of a person and in his or her interaction with others in the process of solving problems through action. On the other hand, competencies are a set of knowledge, skills, attitudes and values that describe learning outcomes as a final process of learning for any educational purpose and support and serve as a basis for different pedagogical and learning models.
2. Learning outcomes are verifiable statements or products where the student demonstrates competence at the end of a program or period of learning.
3. Competencies are presented through actions, learning outcomes of programmes are presented as capabilities for action, and learning outcomes of courses are presented as measurable and verifiable products. 

REFERENCES

- » Adam Manley, R., & Zinser, R. (2012). A Delphi study to update CTE teacher competencies.
- » *Education+ Training*, 54(6), 488-503.
- » Bereczki, E. O., & Karpati, A. (2018). Teachers' beliefs about creativity and its nurture: A systematic review of the recent research literature. *Educational Research Review*, 23, 25-56.
- » Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher education research & development*, 18(1), 57-75.
- » Brown, S., & Knight, P. (2012). *Assessing learners in higher education*. Routledge.
- » Burke, J. W. (Ed.). (1989). *Competency based education and training*. Psychology Press.
- » Kennedy D. 2006. Writing and using learning outcomes: a practical guide, Cork, University College Cork.
- » Kennedy, D., Hyland, A., & Ryan, N. (2009). Learning outcomes and competences. *Introducing Bologna Objectives and Tools*, 2-3.
- » Jenkins, A., & Unwin, D. (2001). How to write learning outcomes. Disponible en <https://www.ubalt.edu/cas/faculty/faculty-matters/How%20to%20write%20student%20learning%20outcomes>.
- » Leadbeater, C. (2008). *What's Next?: 21 Ideas for 21st Century Learning*. Innovation Unit.
- » Le Boterf, G. (2010). Agir et réussir avec compétence (5e édition). In Construire les compétences individuelles et collectives.
- » Lobanova, T., & Shunin, Y. (2008). Competence-based education: A common European strategy. *Computer Modelling and New Technologies*, 12(2), 45-65.
- » McLoughlin, C., & Lee, M. (2008). Mapping the digital terrain: New media and social software as catalysts for pedagogical change. Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008, 641-652.
- » Moon, Y. L. (2007). Education reform and competency-based education. *Asia pacific education review*, 8(2), 337-341.
- » Mulder, M., Weigel, T., & Collins, K. (2007). The concept of competence in the development of vocational education and training in selected EU member states: a critical analysis. *Journal of Vocational Education & Training*, 59(1), 67-88.
- » Tobón S., (2010). *Formación integral y competencias. Pensamiento complejo, currículo, didáctica y evaluación*, 3a ed., Centro de Investigación en Formación y Evaluación CIFE, Bogotá, Colombia, ECOE Ediciones.
- » Winterton, J., Mulder, M., Gulikers, J., Biemans, H., & Wesselink, R. (2009). The new competence concept in higher education: error or enrichment?. *Journal of European industrial training*. Vol. 33 No. 8/9, 2009 pp. 755-770.
- » Zimnyaya, I. A. (2003). Key Competencies-a new paradigm of education result. *Higher education today*, 5, 34-42.