

## **An Overview of the Constructivist Theories and Their Possible Implications in the Design of the ESP Digital Learning Environment**

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### **Abstract**

This paper provides a brief overview of the constructivist learning theories and explains their significance in the design of the ESP digital learning environment. Constructivism provides a unique and challenging learning environment, and coupled with modern technology shows the potential for great advancement in learning practices. Together they provide the opportunity for new possibilities in the learning process. In other words, they allow ESP students to learn to their fullest potential. Complete understanding of ESP needs an increasing research input, including social interaction and intercultural communication competence. The purpose of ESP is to prepare a student (future specialist) to communicate effectively in the professional field and real-life situations. The ultimate goal is to become operational in any learning situation.

**Keywords:** constructivist theories, ESP, digital learning environment

### **Introduction**

Due to the world being interconnected and English being associated with globalization, it is necessary to transform the traditional paradigm of teaching and learning, and to improve the quality and effectiveness of education. Addressing these challenges, we encounter constructivism as a new approach in order to provide innovative way of education, both theoretical and practical.

In order to define constructivism, Fosnot (1989) proposes four principles: learning, in an important way, depends on what we already know; new ideas occur as we adapt and change our old ideas; learning involves inventing ideas rather than mechanically accumulating facts; meaningful learning occurs through rethinking old ideas and coming to new conclusions about new ideas which conflict with our old ideas. It means that constructivism focuses on activities such as problem solving, decision making, creative and critical thinking, active and reflective application of knowledge (Driscoll, 2000). Moreover, constructivist learning encourages critical thinking and creates active and motivated learners. It involves inventing and constructing new ideas (Gray, 2007).

What is more, technologies within the constructivist ESP course facilitate the process of teaching and learning, they stimulate students to be active and cooperative which contributes to increasing learning outcomes.

### **Constructivist theories**

To begin with, constructivist learning theory argues that knowledge is considered to be individually (Piaget, 1968) and socially (Vygotsky, 1962) constructed. Much research has been done by Piaget, who underlines the active role of the individual in the learning process. Piaget's constructivist classroom provides a variety of activities which increase students' readiness to learn. It is of great significance to produce a technology-mediated learning environment that encourages knowledge construction. Technology support (videodisks, CD-ROMs, DVD) in the effective ESP learning environment (Živković, 2016a) encourages innovative teaching and learning approach based on interaction and collaboration (Vygotsky's social constructivism).

It is worth mentioning that the constructivist approach acknowledges learning in context (Duffy and Jonassen, 1991). For effective ESP learning Duffy & Jonassen (1991) state that construction of knowledge happens in a social context, such as classrooms and language laboratories, "where students join in manipulating materials and, thus, create a community of learners who built their knowledge together" (Dewey, 1966).

Much research has been done by Vygotsky who stresses the importance of collaborative learning. As for technology-supported learning environment, students are encouraged to share their knowledge and ideas with their classmates.

According to Bruner (1986) language learning is supported by dialogue (Socratic method of learning) as the most effective way of communication. Students are engaged to answer questions in a way that forces them to regard how they think and respond about related topics. "Individuals make meaning in dialogues and activities about shared problems or tasks" (Helland, 2004).

Regarding Situated Learning Theory (Lave & Wenger, 1991), knowledge, learning and cognition are socially constructed. As Brown et al. (1989) point out, knowledge, learning and cognition are fundamentally situated in activity, context, culture and situations. In the constructivist learning environment students learn by actively participating in their learning by connecting previous knowledge with to new contexts.

Considering contemporary constructivist theories, Jonassen (2000) uses Activity Theory which "provides an alternative lens for analyzing learning processes and outcomes that capture more of the complexity and intergratedness with the context and community that surround and support it".

To sum up, in order to take a specific method or approach, the main aspect to consider is its practicality (Richards & Rogers, 2001). The pedagogic significance of an ESP perspective is that it shifts "the focus of attention to the learner and the learning process" (Seidhofer, 2011).

### **Educational technology**

With the beginning of new millennium, the use of technologies in the ESP learning environment presents a great challenge to consider current issues in education, such as students' motivation, autonomy, creativity, collaboration, and thinking skills. As Perkins (1991) claims, the central thing in the learning process is to activate students and to support the construction of new knowledge on the basis of the existing one.

The fact is that new technology is an example of digital mediating technology (O'Neill, 2008) whose role is perceived as an instructional tool for providing a richer and more exciting learning environment (Duffy & Cunningham, 1996).

Furthermore, at an educational level the Internet concretely, is a good source of information, offering authentic materials that can be used in the classroom related to responding to students' needs. "Internet-generated materials can be flexibly arrayed to engage students with topics and cognitive tasks relevant to students' professional futures" (Kimball, 1998). Technologies engage students in meaningful and authentic activities with open-ended software and the Internet (Jonassen, 2000).

In view of this, 'Mindtools' (Jonassen, 1994; Jonassen & Reeves, 1996) "Mindtools" engage students in constructivist activities that support critical thinking and problem solving instead of teaching for memorization. Mindtools allow the student "to think harder about the subject matter domain being studied while generating thoughts that would be impossible without the tool" (Jonassen et al, 2003).

As we have seen, there are many advantages of modern technologies. For instance, computer programs stimulate independent learning, increase interactivity, and force student-centered learning.

In view of what has so far been discussed, it is clear that the integration of constructivist principles and technology shows the potential for great progress in the learning process. "They provide the opportunity to make and remake the concept of ESP learning, and have brought new possibilities for learning. In other words, they can allow ESP students to learn to their fullest potential " (Živković, 2016b).

A rising trend in ESP learning

Constructivism as a new paradigm in teaching and learning has brought transformation within the classroom. A rising trend in ESP education is to create such a learning environment where students' knowledge is facilitated (Živković, 2013; Živković, 2014). Such an environment is a place where students are not frustrated, and in which they are focused on intentional learning (Jonassen, 1994).

Wilson (1995) suggests a definition of a constructivist learning environment as "a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities". It is the environment that forces student-centredness in order to develop creative and critical thinking skills. In the learning environment "students join in manipulating materials and, thus, create a community of learners who built their knowledge together" (Dewey, 1966).

Contemporary conception of the ESP constructivist learning environment is that it is technology-supported in which student can concentrate in meaningful learning. The constructivist environment creates content-relevant experiences by utilizing technologies and resources to support unique learning goals and knowledge construction (Young, 2003). Further, the construction of technology-supported learning environments is based on the need to embed learning into authentic and meaningful contexts (Brown et al., 1989). In this context, the use of technology contributes to the realization of meaningful, authentic, active, interactive and problem-based learning (Živković, 2011).

It is with this in mind that "the richness of the technology permits us to provide a richer and more exciting learning environment...our concern is the new understandings and new capabilities that are possible through the use of technology" (Duffy & Cunningham, 1996).

#### A constructivist teacher

In this new era of information and communication teaching is facing challenges from traditional ways of learning towards more innovative ones. Along with all mentioned, the role of teachers has to be reconsidered. Teaching students implies exposing them to construct their own knowledge and understanding, and to acquire relevant practical experience for their career development.

In the constructivist technology-supported classroom becoming an effective teacher adds great demands and carries great transformation. It is worth mentioning that the teacher is no longer regarded as the dispenser of knowledge and decision maker. Instead, the teacher has become a facilitator and a guide who helps students become active in the learning process and "make meaningful connections between prior knowledge, new knowledge, and the processes involved in learning" (Copley, 1992) that results in achieving outcomes.

Implementing pedagogy-technology integration in the ESP constructivist learning environment is one of the most demanding tasks. So, the main challenge facing ESP teachers is to acquire a new approach, and to efficiently incorporate computer and the Internet technology into the educational process.

To be prepared for this globalized and interconnected world, the teacher can be able to recognize and maximize the potential of the technology by using it effectively for practical work. It is needed to design courses and to meet specific needs and interests of the students (Hutchinson and Waters, 1987).

In this new globalized and interconnected world, the teacher should encourage the development of creative and critical thinking skills. The final goal is to enhance the quality of teaching and learning, and produce a positive, an authentic, fostering and productive learning environment that allows students the construction of new knowledge based on the previous one.

Considering this issue, it means that constructivism requires a teacher "whose main function is to help students become active participants in their learning and make meaningful connections between prior knowledge, new knowledge, and the processes involved in learning" (Copley, 1992).

#### The student-centeredness

As English has become "the primary means of communication at workplaces both within and across boundaries" (Purpura & King, 2003), there is an increasing demand for learning English for Specific Purposes (ESP). The purpose of ESP is to

prepare students to effectively communicate in real-life situations and collaborate with business colleagues in professional areas. More specifically, the focus is on the practical experience and direct activity of students. Student-centered learning requires students to set their own goals for learning, and determine resources and activities that will help them meet those goals (Jonassen, 2000).

As stated by Jonassen (1994) learners must be given opportunities to be active in ways that will promote self-direction, creativity and the critical analysis of problems requiring a solution. In this sense, "Learning becomes a continuous, life-long process which results from acting in situations" (Brown et al., 1989).

As far as technologies are concerned, will "engage the learners more and result in more meaningful and transferable knowledge...Learners function as designers using the technology as tools for analyzing the world, accessing information, interpreting and organizing their personal knowledge, and representing what they know to others" (Jonassen, 1994).

It is clear that technologies have transformed the learning process in that they foster meaningful learning experiences (Jonassen, 1994), in fact, they are regarded as an integral part of cognitive activity (Duffy & Cunningham, 1996) which enhance learning and help the student examine the problem and make decision. Powerful capabilities of computers make it possible to access, represent, process and communicate information in new ways (Kozma, 1991). In this sense, modern technologies provide students with information that support knowledge creation, communication and collaboration.

When considering an ESP perspective, it can be noted that it is founded on the idea that students learn language in collaborative learning settings. In this sense, through collaboration with their classmates, students are engaged in learning that is challenging and effective.

Taking all this into account, in the constructivist ESP digital environment the high-speed expansion of technology motivate constructivist innovations and provide the realization of active learning that challenges students to 'learn how to learn'.

With regard to the role of the student, computers and the Internet support cognitive processes which expand the learning process, and by helping students to explore, collaborate, and solve a problem.

## Conclusion

This paper has strived to describe both a theoretical and empirically based study of the ESP education within technology-supported context. As it has been observed, it considers the constructivist theories and explains their significance in the design of the ESP digital learning environment that is "learner-centered, knowledge-centered, community centered and assessment-centered" (Bransford et al., 2000).

The constructivist learning environment together with modern technologies stimulates students' communication, and foster their activity. Moreover, technology in the education process requires the use of meaningful and authentic activities, to give the learning situation a purpose (Reeves et al., 2002). "Learning to think critically and to analyze and synthesize information in order to solve technical, social, economic, political and scientific problems are crucial for successful and fulfilling participation" (Dunlap & Grabinger, 1996).

To sum up, with the beginning of new millennium the emphasis is on the interdisciplinary nature of the classroom which needs students to access knowledge resources, develop the skills they will need in the workplace, collaborate with classmates, communicate effectively. The goal of the 21st century classroom is to prepare students to become productive members of the workplace. In such classroom students become designers of knowledge, efficient communicators, successful teammates, competent thinkers, problem solvers and career experts.

## References

- [1] Bransford, D. J., Brown, L. A., & Cocking, R. R, eds. 2000. "How People Lear Brain,
- [2] Brown, J. S., & Collins, A., D, P. 1989. "Situated cognition and the culture of learning". *Educational Researcher*, 18 (1), 32-41.
- [3] Bruner, J. *Actual Minds, Possible Worlds*. Cambridge, MA: Harvard University Press, 1986.

- [4] Copley, J. 1992. "The integration of teacher education and technology: a constructivist model". In D. Carey, R. C. D. Willis, & J. Willis (Eds.), *Technology and Teacher Education*, Charlottesville, VA: AACE.
- [5] Dewey, J. 1966. *Democracy and Education*. New York: Free Press.
- [6] Driscoll, M. P. 2000. *Psychology of Learning for Instruction*. (2<sup>nd</sup> ed.). Needham Heights, Ma: Allyn & Bacon.
- [7] Duffy, T. M., & Cunningham, Donald. J. 1996. "Constructivism: Implications for the design and delivery of instruction". D. H. Jonassen (Ed.), *Educational communications and technology*, New York: Simon & Schuster Macmillan, 170-199.
- [8] Duffy, T. M., & Jonassen, D. H. 1991. "Constructivism: New implications for instructional technology?" *Educational Technology*, 31(5), 7-11.
- [9] Dunlap, J. C. & Grabinger, S. 1996. "Rich Environments for Active Learning in Higher Education". *Constructivist Learning Models in Higher Education*. B.G. Wilson (ED.) Englewood Cliffs NJ, Educational Technology Publications.
- [10] Education, National Research Council. Washington, D.C., 2000.
- [11] *Education*. Second International Scientific Conference: University Education in Transition,
- [12] Fosnot, T. C. 1989. *Enquiring teachers, enquiring learners: A constructivist approach for teaching*. New York: Teachers College Press.
- [13] Gray, A. 2007. *The Road to Knowledge is Always under Construction': A Life History Journey to Constructivist Teaching*. SSCA research centre. University of Saskatchewan.
- [14] Helland, B. 2004. "The Constructivist Learning Environment Scorecard: A Tool to Characterize Online Learning".
- [15] Huchinson, T. & Waters, A. 1987. *English for Specific Purposes: A Learning-centered Approach*. Cambridge: Cambridge University Press.
- [16] Institution for Applied Studies for Entrepreneurialship.
- [17] Jonassen, D. H. 1994. "Thinking technology: Towards a Constructivist Design Model". *Educational Technology*, 34-37.
- [18] Jonassen, D. H. 2000. "Revisiting activity theory as a framework for designing student-centered learning environments". In Jonassen, D. H., & Land, S. M. (Eds.), *Theoretical foundations of learning environments*. Mahwah, NJ: Lawrence Erlbaum, 89-121.
- [19] Jonassen, D. H., & Reeves, Thomas. C. 1996. "Learning with technology: Using computers as cognitive tools". In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology*, 1st edition. New York: Macmillan, 693-719.
- [20] Jonassen, D. H., Howland, J., Moore, J. & Marra, R. M. 2003. *Learning to solve problems with technology : a constructivist perspective*(2<sup>nd</sup>ed.).NJ: Merrill.
- [21] Kimball, J. 1998. "Task-based medical English: elements for Internet-assisted language learning." *Call Journal*, vol. 11, no. 4, pp. 411-418.
- [22] Kozma, R. 1987. "The implications of cognitive psychology for computer-based learning tools". *Educational Technology*, 27, 20-25
- [23] Lave, J. & Wenger, E. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge UK: Cambridge University Press.
- [24] "Mind, Experience, and School". *Committee on Developments in the Science of Learning*
- [25] O'Neill B 2008. Cognition and mobility rehabilitation following lower limb amputation. In: Gallagher, Desmond & MacLachlan (Eds) *Psychoprosthetics: State of the Knowledge*. London: Springer.
- [26] Perkins, D. 1991. "Technology meets constructivism: Do they make a marriage?" *Educational Technology*, 31(5), 18-23.
- [27] Piaget, J. *Structuralism*. 1968. New York: Harper and Row.
- [28] Purpura, J. & Graziano-King, J. 2003. "Investigating the Foreign Language Needs of Professional School Students in International Affairs". *Working Papers in TESOL & Applied Linguistics*, 4 (1). pp: 1-33.

- [29] Reeves, T. C., J. & Herrington, R. O. 2002. "Authentic activities and online learning". In A. Goody, J. Herrington & M. Northcote (Eds.), *Quality conversations: Research and Development in Higher Education*, Volume 25, 562-567.
- [30] *Research and Educational Practice*, Commission on Behavioral and Social Sciences and
- [31] Richards, J. C., & Rodgers, T. 2001. *Approaches and Methods in Language Teaching*. Second Edition. New York: Cambridge University Press.
- [32] Seidlhofer, B. 2011. *Understanding English as a lingua franca*. Oxford: Oxford University Press.
- [33] *Transition in University Education – Modern and Universal*. Belgrade. Higher Education
- [34] Vygotsky, L. S. 1962. *Thought and Language*. Cambridge: MIT Press.
- [35] Wilson B. G. (Ed.), 1995. "Constructivist learning environments: Case Studies in Instructional Design". Englewood Cliffs, NJ: *Educational Technology Publications*.
- [36] Young L. D. 2003. "Bridging Theory and Practice: Developing Guidelines to Facilitate the Design of Computer-based Learning Environments". *Canadian Journal of Learning and Technology*, 29(3).
- [37] Živković, S. 2011. *Modernization of English as Foreign Language Studies in University*
- [38] Živković, S. 2013. To Modernize or not to Modernize - There is no Question. *Academic Journal of Interdisciplinary Studies*. MCSER Publishing: Rome-Italy.
- [39] Živković, S. 2014. *Constructivism – An Emerging Trend in ESP Teaching and Learning*. Language, Literature and Culture in Education. Nitra, Slovakia.
- [40] Živković, S. 2016(a). "The ESP Technology-Supported Learning Environment". *European Journal of Multidisciplinary Studies*. Education and research. Vol.6, No.1. Sofia, Bulgaria.
- [41] Živković, S. 2016(b). An ESP constructivist learning in engineering. 9<sup>th</sup> International Conference on Social Sciences, Dubrovnik.