LEARNING THEORIES, AND THEIR APPLICABILITY IN THE DIGITAL AGE

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Abstract

This article looks at the transition, over the last few decades, from a teacher-centric to a learner-centric education model culminating in the present-day connective learning model under the influence of various factors, among which technology, new scientific theories (chaos, network, complexity and self-organization theories), and the pressures of an increasingly demanding knowledge society hold an important place. It outlines both the theoretical and the practical implications of the latest education paradigm shift in terms of pedagogical methods, the teacher and learner roles, learning goals, and the very meaning of knowledge and learning. It places the current technology-based education model against the backdrop of previous learning theories and practices, and analyzes the characteristics that set it apart from all past approaches to teaching and learning. After a brief account of the way the learning environment is being continuously re-configured by the latest web technologies and learning theories, it reflects on the best options for Romanian higher education. Even though regional characteristics are still playing an important role in shaping teaching and learning practices, no education system can stay isolated from, and out of sync with, the new education trends in our globalized, interconnected world.

Keywords: Teacher-/student-centred learning, behaviourism, constructivism, connectivism, network(ing).

1. From a Teacher-Centred to a Student-Centred Education Model, or from the "Sage on the Stage" to the "Guide on the Side"

The present day learning environment has very little in common with the traditional classroom setting that used to be the norm forty or fifty years ago. Over the last few decades, technology has been one of the main factors that have impacted the field of education on both a practical and a theoretical level, changing people's approach to learning, contributing to a greater or lesser extent to a paradigm shift from a teacher-centred to a student-centred education model, and prompting a reconsideration of educational goals in keeping with learners' needs, generational characteristics and the exigencies of today's knowledge society. A brief overview of two learning theories and practices (one traditional and one

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modern) will help us examine the differences between them and the full significance of the paradigm shift mentioned above.

The so-called "traditional education" or "transmittal model" (King, 1993: 30) is one that advocates the central role of the teacher as instructor, knowledge transmitter, and primary source of knowledge who is totally in control of the learning content, methods and goals, and the passive role of students as empty vessels waiting to be filled with knowledge and information, whose progress is monitored and assessed by the teacher. This centuries-old education model has come to be labeled as "behaviourist" due to its similarities with the principles of the more recent (early 20th-century) psychological theory developed by J.B. Watson. According to the behaviourist educational psychology, learning consists in behaviour changes, and learners' behaviour can be improved or controlled through stimulus-response conditioning (implemented by the teacher) which is very similar to the one applied by Pavlov in his animal-based experiments – since behaviourist psychology is viewed by some of its theorists as a "branch of natural science" (Watson, 1913): the teacher is supposed to repeatedly expose learners to certain stimuli in order to obtain the desired responses. To consolidate those new behaviours, the teacher can apply either positive or negative "reinforcements" (such as praising good student performance or exempting students from unpleasant obligations as a reward for good classroom behaviour). By contrast, inadequate responses to stimuli can be discouraged if the teacher resorts to either positive or negative punishment (in the form of more homework assignments, or no top grades for failing to meet project-submission deadlines, for instance). Knowledge is therefore external to learners, and must be internalized. A typical example of behaviourism applied to language learning is the traditional "audio-lingual" method (used especially with very young learners at beginner level), which consists in students repeating sentences and phrases in a chorus, after the teacher, and the teacher promptly correcting the mistakes without really explaining grammatical structures, etc.; the method is based on repetitive, imitative drills (the so-called "echoic behavior" described by Skinner (Skinner, 1957)) and rote learning. Already in late 20th century, this traditional education model was felt by researchers as "outdated". In 1993, Alison King, for instance, notes that such an education model with the teacher as "the sage on the stage" would be ineffective for the next century "when students will be expected to think for themselves, and pose and solve complex problems, and generally produce knowledge rather than reproduce it" (King, 1993: 30).

Despite all criticism, we, language teachers, know how useful certain elements of the traditional method still are if used alongside other, more modern approaches, especially when teaching beginners. Purged of the outdated behaviourist choral chanting, the traditional method can be applied to teaching both grammar and vocabulary (and the correct pronunciation) with the help of drills, i.e. practising new words/ phrases, as well as lexical patterns and grammatical structures (e.g.

sentences starting with "there is/ there are", the "for-to infinitive" construction, etc.) almost to exhaustion, until they finally sink in. Tedious as they may sometimes appear to be, grammar, vocabulary, and pronunciation drills help young students acquire communication skills and enhance their overall language confidence.

One big step ahead in the theory of education, in the direction anticipated by A. King, was made by mid 20th-century constructivism by shifting the educational focus from the teacher to the student, and thus preparing the ground for the really radical break with tradition marked by 21st-century connectivism. In constructivism – a learning theory greatly influenced by the research work of Jean Piaget (Piaget, 1964) and Lev Vygotsky (Vygotsky, 1978) – and developed in the mid 20th century, the architectural metaphor behind this concept points to the fact that knowledge (unlike mere information) is not a given, but must be built by the learner upon the foundation of prior knowledge and experiences. The student constructs and re-constructs knowledge as he or she tries to make sense of new information, new situations, or new experiences (Driscoll, 2000: 376) in terms of what he or she already knows. In opposition to the behaviourist view, students are supposed to be actively involved in the learning process, responsible for the success of their own learning experience, and committed to collaborative and interactive work (as interaction with their teacher, their peers and the outside world helps them expand their knowledge). According to the constructivist theoretical perspective, knowledge resides (or rather occurs, or is created) in the learner's mind (where all those connections between old and new ideas and experiences are made), but it cannot be reached through solitary work, and requires collaboration or interaction (either face-to-face, in the traditional classroom setting, or online, mediated by technology). The success of the learning experience depends on the learner's autonomy, responsibility, self-motivation, and active participation in the learning process. The advantage of this approach to learning consists in the fact that any student who is so actively involved in information processing and knowledge/ meaning construction will find it easier to remember and apply what he or she has learned, compared to someone who absorbs information mechanically. The teacher's role in the learning process is that of a "guide on the side" (King, 1993: 30) who assists students in constructing knowledge, making connections between old and new knowledge and information, and making sense of new situations with the help of already acquired information; the teacher is, in other words, a facilitator and feed-back provider in charge of maintaining the coherence and goal-orientation of the learning experience, especially since, as Siemens points out, constructivist learning seems to be a "fuzzy", "messy" and "complex" (Siemens, 2005) internal process. The teacher as guide or facilitator is no longer the infallible authority who "has all the answers" and "does most of the talking" (King, 1993: 30); his or her responsibilities are to ensure the proper context and the necessary resources, to "stimulate students to think up their own answers", and,

most importantly, to "facilitate students' interaction with the material and with each other in their knowledge-producing endeavor" (King, 1993: 30).

In language learning, the constructivist approach can be used either as a method of expanding one's vocabulary and using more and more complex lexical structures (phrases, idioms, compound words, etc.), or as an effective way of teaching and learning grammar – at beginner, intermediate and advanced levels, by building on simpler, already acquired notions and patterns. For instance, students studying English may learn how to

- turn a Present Tense verb into the Past Tense, or a singular noun into the plural (at beginner level);
- use inversion in conditional clauses starting from the classic if-clause structure (e.g. *If I had met him again, I would surely have recognized him. Had I met him again, I would surely have recognized him*);
- use the gerund by rephrasing simple that-clauses (e.g. *I remember that I read the contract before the meeting. I remember reading the contract before the meeting*);
- form alternative passive sentences by shifting the emphasis from one part of the original sentence in the active voice (the direct object) to another (the indirect object); e.g. *She gave me three books to choose from. Three books were given to me to choose from. I was given three books to choose from*;
- rephrase a request to make it more polite (e.g. *Could you help me with this luggage? Would you be so kind as to help me with this luggage?*);
- rephrase a sentence using modals instead of ordinary verbs while keeping the meaning unchanged (e.g. *She doesn't want to make any comments. She won't make any comments*.)

According to education theorists, however, both the traditional and the constructivist education models seem to be superseded by the current trend towards a connectivist approach recommended by one of its proponents as "a learning theory for the digital age" (Siemens, 2005).

2. The Connectivist Turn

Compared to both traditional and constructivist education, connectivism proposes an education paradigm built on a new understanding of knowledge and learning. Stephen Downes defines connectivism as a theory according to which "knowledge is distributed across a network of connections", and learning is the "ability to construct and traverse those networks" (Downes, 2007). Although it may appear to continue along much the same lines as constructivism (e.g., student-centrism, collaborative, interactive world, student responsibility, the importance of

connecting ideas, concepts, situations, etc.), it actually marks a radical departure from all previous theoretical approaches, both traditional and modern, bringing about notable conceptual changes and radicalizing the idea of learning as a connective process based on the use of technology, with knowledge residing outside the individual learner, in databases/ non-human appliances.

Here are, in a nutshell, the main principles and ideas of constructivism – as explained by its two leading theorists, George Siemens and Stephen Downes – that distinguish it from both the traditional (behaviourist) and the contructivist approaches to learning:

- learning is no longer an internal process (i.e. taking place inside the learner), and is "no longer acquired in the linear manner"; learning is external (i.e. occurring "outside of people"), and "stored and manipulated by technology" (Siemens, 2005);
- technology along with the ability to synthesize and recognize connections and patterns are indispensable to learning; as Siemens puts it, "We derive our competence from forming connections" (Siemens, 2005), and technology is a great aid to forming those connections;
- the two most important activities underlying connective learning are "meaning-making and forming connections between specialized communities"; unlike constructivism, connectivism states that meaning does not have to be constructed since it already exists; it is up to the learner to "recognize" the apparently hidden patterns; this connectivist idea is in keeping with the chaos theory, which "recognizes the connection of everything to everything" (Siemens, 2005); chaos is understood as "complicated arrangements that initially defy order" (Siemens, 2005);
- another key learning skill is "the ability to recognize and adjust to pattern shifts"; this is also compatible with the chaos theory, which proclaims the above-mentioned idea of general connectedness: "If the underlying conditions used to make decisions change, the decision itself is no longer as correct as it was at the time it was made" (Siemens, 2005); that is why decision-making (deciding what to learn) and meaning-making should always take the "shifting reality" into account;
- learning is a "self-organizing process", understood as the "spontaneous formation of well organized structures, patterns, or behaviors, from random initial conditions" (Rocha, 1998: 3). According to Siemens, the learner's ability to connect various sources of information, and thus create "useful information patterns" is a must in today's knowledge society (Siemens, 2005);
- the learner is viewed as part of a learning community, or a "clustering of similar areas of interest that allows for interaction, sharing, dialoguing, and thinking together" (Siemens, 2005); learning consists in "connecting specialized nodes or information sources", where "nodes" are understood

as ideas, fields, communities that are recognized for their expertise and that have the power to "cross-pollinate" (Siemens, 2005) learning communities;

- knowledge is a "network phenomenon"; if "to know" means "to be organized in a certain way, to exhibit patterns of connectivity", it follows that "to learn" is "to acquire certain patterns". (Downes, 2005);
- learning and knowledge are based on a "diversity of opinions" (Siemens, 2005);
- connecting disparate ideas and fields may lead to innovation;
- maintaining connections is the key to continuous learning.

Considering all the above principles and characteristics of connectivism, we can understand why it is practically impossible to imagine connective learning without the use of technology, especially the latest Web 2.0 tools and technologies that foster connectivity and networking, transforming the traditional learning environment. If previous approaches to learning are not at all or partially dependent on technology, the connective method is inextricably linked to cutting-edge web technologies and online interaction, which explains why Siemens views it as the proper approach to learning in the digital age.

In the connective learning paradigm, students are encouraged to form connections between ideas, concepts, situations, information, etc., to interact with each other (and with the teacher), and engage in various collaborative activities, knowledge sharing, and debates, in line with some of the major characteristics of "Net Geners", or the Net Generation" (Tapscott, 1997), examined by Berk: the young generation is "technology savvy", team-oriented (attracted to collaborative activities), showing a clear preference for fast communication (operating at "twitch speed"), relying on search engines for information, and very comfortable with a search process that is increasingly "meandering and interactive" (Berk, 2009: 9-13). Within this paradigm, the teacher, on the other hand, assumes the role of competent guide that channels students' attention to the available databases and sources of information, endorsing their autonomy, self-motivation, and intellectual inquisitiveness. Even though the high degree of student autonomy and self-motivation required by connective learning may clash with cultural characteristics (such as powerful hierarchical structures, collectivism, intolerance of uncertainty or lack of clarity) in certain parts of the world, Romania included, our teaching experience gives us reasons to believe that the generational biases, coupled with certain Romanian cultural paradoxes or inconsistencies (e. g., openness to novelty (Dumitrescu, 2013: 540-541)) and with the increasingly influential Internet culture, may eventually prevail over predominant regional differences.

In accordance with the connectivist principles and ideas mentioned above, students can take advantage of the wide range of interaction and collaboration opportunities provided by present-day Web 2.0 tools and technologies such as blogs, wikis, podcasts, virtual worlds (Second Life), social and educational networking, etc. to

make connections between various sources of information and create such "information patterns" as the ones mentioned by Siemens, while commenting on each other's posts, tagging, evaluating, exchanging ideas, correcting each other's writing or even adding to it, asking and answering questions, collaborating with one another to create educational podcasts, exploring a variety of new situations and unfamiliar settings, or learning about other cultures by entering into virtual worlds under assumed identities, or "avatars", and interacting in multiple ways within specialized groups of friends, class-mates and other people with similar learning interests. Learners of English as a second language find themselves in a privileged position, since most of the web resources and educational sites are in that language.

The Wikipedia, the free online encyclopedia, which has come to be regarded by most of our students as one of the handiest sources of information available on the Internet, is also a classic example of connective learning achieved with the help of Web 2.0 technology. Apart from making it possible for anyone to add new content, Wikipedia provides the necessary tools that allow collaborative work (e.g. editing the existing content) and the distribution of knowledge across an extensive network of connections. Stephen Downes compares Wikipedia to Britannica in terms of their different ways of arriving at truth: the former encyclopedia attempts to "capture, as public knowledge, what can be observed via the interactions of numerous instances of private knowledge"; due to successive editing, it records whatever results from the interactions of many "instances of private knowledge" (Downes, 2005). Each Wikipedia page is produced through such interactions, rather than through a simple act of "aggregating" a multitude of individual points of view. By contrast, in the case of the latter type of encyclopedia (Britannica), the authors, who belong to expert communities, internalize the knowledge of those communities, or "interpret" it, after which their own interpretations are, themselves, subject to further interactions (with editors, proof-readers). Since in both cases knowledge is ultimately a matter of interaction (even though the way of arriving at it is different), the only criteria for assessing the effectiveness and reliability of the two approaches to generating knowledge (without excluding, however, the possibility of error in either case) would be – from a connectivist perspective – the extent to which they fulfil four basic requirements of "knowing networks": diversity (a wide spectrum of points of view), autonomy (individual knowers contributing their knowledge, as opposed to simply echoing other people's points of view), interactivity (i.e., knowledge achieved through interaction between members rather than mere aggregation or juxtaposition of members' perspectives), and openness (the possibility of feeding points of view into the system, and of each viewpoint to interact with others, or be interacted with) (Downes, 2005).

Judging by Downes's description of the 4 criteria mentioned above, we can conclude that the reliability of knowledge is very difficult to attain by using any of

the two approaches mentioned above – in other words, not even the interactive method is error-proof. As a matter of fact, Downes himself admits that both approaches violate some of the 4 criteria, to a higher or lesser extent – either through lack of openness – e.g. an emphasis on "central and highly connected nodes" that prevents the free flow of knowledge, and reduces diversity and interactivity – or through the existence of constraints even in the case of open networks, where only the points of view of the most influential members, i.e. "those occupying the highly connected nodes" (Downes, 2005), are presented to the others.

Beyond all epistemological considerations, we should add that connective learning, and the interactive and networking skills developed by it may be leveraged in people's continuing and lifelong education, especially within the framework of today's knowledge society, where people need to find effective ways to permanently update their knowledge and keep informed on the latest developments in their professional areas. Keeping one's job-related knowledge up-to-date is indeed an absolute requirement, given the "shrinking half-life of knowledge", to use Cathy Gonzalez's frequently quoted expression, by which she means the shortening "time span from when knowledge is gained to when it becomes obsolete" (Gonzalez, 2004), as a characteristic of our times. Connective learning and the skills related to it are also a great help to people wanting to learn new things or to get new professional training in case they have to change their career path under the pressure of an increasingly volatile labour market.

3. Conclusions

The above overview of the differences between the three education models and epistemological approaches (behaviourism, contructivism and connectivism) is not meant to privilege one over the others. The connective approach to learning, as acknowledged by its two main proponents (Siemens and Downes), cannot guarantee the effectiveness of the education process. Its advantage, however, over traditional (behaviourist) methods is its compatibility with the present-day student-oriented education paradigm, and with the general context in which education takes place, which is one marked, on the one hand, by the shortening life-span of knowledge, and on the other hand, by the use of technology and its effects on students' thinking patterns and learning habits (with interaction, networking, collaboration, and intellectual autonomy playing a major role). No education system can stay isolated from, and out of sync with, the latest global developments in our globalized, interconnected world. Like constructivism, connectivism emphasizes student autonomy and peer-to-peer interaction, but it does so in a more radical manner, from a totally different theoretical perspective on knowledge and learning, and privileges the idea of connections and networking over everything else (which could be a great premise for continuing and lifelong learning). Perhaps to a greater extent than both traditional and constructivist approaches, it effectively

addresses one of the key requirements of an effective education model: adequacy to the generational characteristics of today's young learners belonging to the so-called "Net Generation", who are increasingly immersed in the digital world, and who are naturally attracted to the idea of online networking and collaboration.

Some principles of connectivism might benefit the Romanian education system, if applied to tertiary education, where connective learning could be successfully integrated into a wider, blended education model; ideally, such a model should strike the right balance between modern and traditional methods of teaching and learning, in keeping with the needs and expectations of our students, the demands of a highly volatile labour market, the requirements of today's knowledge society, and last but not least, our cultural characteristics. A mix of all the three methods (traditional-behaviourist, contructivist, and connective), in varying doses, with a special focus on creative, interactive, collaborative work, would perhaps be the best solution for an effective 21st-century higher education model in Romania.

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