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TOPICAL LEARNING PARADIGMS FOR ONLINE EDUCATION

Affordances of information-communication technology enable faculty to migrate the face-to-face courses into an online environment within a rapid time frame. Leaning problems are approached from varied theoretical perspectives. An eclectic approach to teaching and learning could combine a traditional educational perspective with the perspectives of constructivism, social constructivism, sociocultural theory and experientialism. The vital factors in online education are teacher guidance, collaboration with peers, social interaction, language, culture, the structured activity of instruction, teaching methods, assessment of the evolving cognitive capacities in students, feedback, remedial activity, changing environment, recurring patterns, memorization and rote learning. The teacher is a facilitator in the learning process. The learner is active in gaining knowledge. Mediation between the learner and the material to be learned is carried out through the teacher and organized learning activity. Discourse is an educational focus. Thought is seen as internalized discourse. Reality is a personal concept as every person constructs their own version of reality. Knowledge is a social construct. Social and individual processes are interdependent in the construction of knowledge. Meaning and thought are embodied. People are not free to think anything as the same neural and cognitive mechanisms are involved in perception, movement, conceptualization and reasoning.

Keywords: *online education, learning paradigm, constructivism, social constructivism, experientialism, sociocultural theory.*

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АКТУАЛЬНІ ПАРАДИГМИ НАВЧАННЯ ДЛЯ ЗДОБУТТЯ ОСВІТИ ПО ІНТЕРНЕТУ

Можливості, які надає інформаційно-комунікативна технологія, дозволяють за короткий проміжок часу переробити ті курси, що розраховані на студентів у класній аудиторії, для навчання по інтернету. Існує багато теоретичних підходів до навчання. Еклектичний підхід міг би поєднати традиційні освітні парадигми з такими парадигмами, як конструктивізм, соціальний конструктивізм, суспільно-історична теорія та експеріенціалізм. До важливих факторів, які сприяють процесу освіти по інтернету, належать керівництво викладача, спілкування з однолітками, суспільна взаємодія, мова, культура, структурована навчальна діяльність, методи викладання, оцінка когнітивних здібностей студентів, зворотній зв'язок, виправлення помилок, мінливе середовище, повторювані патерни, запам'ятовування та заучування напам'ять. Викладач виконує роль посередника, який полегшує студенту виконання завдань в ході навчального процесу. При оволодінні знаннями студенту відведена активна роль. Посередництво між студентом та матеріалом, що вивчається, здійснюється завдяки викладачу та організованій навчальній діяльності. У фокусі освітнього процесу знаходиться дискурс, а думка представляє собою засвоєний студентом дискурс. Людина моделює власну версію реальності. Знання розглядаються як соціальний конструкт. Соціальні та індивідуальні процеси взаємопов'язані в структурі знань. Смисл та мислення є втіленими. Людина не може мислити що завгодно, оскільки одні і ті ж самі нейронні та когнітивні механізми використовуються для перцепції, руху, концептуалізації, а також у логіці.

Ключові слова: *освіта по інтернету, парадигма навчання, конструктивізм, соціальний конструктивізм, експеріенціалізм, суспільно-історична теорія.*

A rapid migration from face-to-face to online education has turned into a mandate all over the world due to the pandemic. This migration has changed delivery media and called for a blend of technologies and instructional methods. A frantic tempo of migration has given no time for faculty members to properly redesign courses online and integrate face-to face learning experiences with online learning experiences. Since an online environment differs from a classroom environment, cognitive mechanisms of learners in an online setting can be different from the learned cognitive mechanisms that have been created in the classroom. Current education remains within the frameworks of the curricular process that was implemented before the pandemic. Fundamentally different methods for online education still have to come. This research tries to illuminate topical learning paradigms to meet the challenges of full online education in the digitization era.

The aim of the research is to specify topical education approaches for online education, to improve faculty self-efficacy, to contribute to the design of online courses, to link pedagogical theory to the practice of teaching and learning foreign languages in an online medium. Teachers should have a step-wise guide to design online courses, set goals for learners, employ instructional strategies and use the methods of assessment in an online setting. An online course is the way of the organisation of an educational process or its part, using e-learning or distance learning technologies [1, p. 82]. Education-friendly platforms for online learning are Google Meet, Zoom, Google Hangouts, Google Classroom, to name a few.

The object of the research is online education. "Online education is a combination of teaching technology, education concepts, and traditional education to form a new educational mode suitable for modern educational requests" [25].

The subject of the research is the learning paradigms that can be appropriate for the information and communication database management technology and the learning management system.

The research is of topical interest as data in education come to the fore and information-communication technologies allow new forms of online learning. Online learning is a form of distance learning when the Internet resources are used [1, p. 82].

The methodology of the research is based on the synergistic approach that enables us to investigate the processes of the emergence of new characteristics in online education as a complex system. The methods of the research are the method of rising from the abstract to the concrete, the method of formalization, the method of a mental experiment as well as the information modelling method, which is based on the use of information models of objects and events under research. The feature of this method is that the model of a prototype system is based on the results of direct physical observations, measurements or experiments rather than on extant theoretical propositions. General scientific methods of the research are abstraction, analysis, synthesis, analogy, induction and deduction. Research materials are scientific papers in Linguistics, Pedagogy, Psychology, Philosophy and Information Systems.

In higher education, a plethora of leaning paradigms is used to maintain the structured activity of classroom instruction. Major extant learning paradigms are listed alphabetically: behaviourism, cognitivism, connectivism, constructivism, empiricism, experientialism or an embodied realism, functionalism, materialism, maturationism, objectivism, phenomenology, rationalism, realism, social constructivist perspective and sociocultural theory. This research deals with constructivism, social constructivist perspective, experientialism and Vygotsky's sociocultural theory.

Constructivism. Researchers-cum-practitioners show an interest in constructivism. The website PubMed, using the key word 'constructivism', illustrates that the annually published number of scholarly articles has increased from 4 papers in 2011 to 44 papers in 2021 [16]. It indicates a shift from traditional knowledge acquisition theories like behaviourism, objectivism, cognitivism to constructivism, which stems from cognitive science.

The major contributors of constructivism are Jean Piaget, Lev Vygotsky, Mark Baldwin, Ernst von Glasersfeld, C. T. Fosnot, J. C. Cronje, C. Vrasidas, Kelly R. Elander, Derek Louis Meyer, to name a few. Nelson Goodman, Jerome Bruner, Ulric Neisser, Howard Gardner among others have contributed to constructivism in teaching and learning.

Piaget maintains that "knowledge proceeds neither solely from the experience of objects nor from an innate programming performed on the subject but from successive constructions, the result of the constant development of new structures" [15, p. V]. "There is no structure apart from construction" [14, p. 140]. In essence, Piaget states that the human develops in a physical, biological and cognitive sense as a whole system.

Relationships between constructivism and the technology of instruction, the structure and the meaning, an active organism and sense have been investigated by T. M. Duffy, D. H. Jonassen and D. N. Perkins. While in the tradition of Western philosophy "knowledge should represent a "real" world that is thought of as "existing", separate and independent of the knower" and "this knowledge should be considered "true" only if it correctly reflects that independent world" [8], constructivism states that there "are many ways to structure the world, and there are many meanings or perspectives for any event or concept" [4, p. 3]. Constructivism implies that learners construct their version of reality because an objective reality is not accessible to human beings.

Over the last decades interest in constructivism "led to a debate between those that place more emphasis on the individual cognitive structuring process and those that emphasize the social and cultural effects on learning" [6, p. 21]. "Central to the vision of constructivism is the notion of the organism as "active" – not just responding to stimuli, as in the behaviorist rubric, but engaging, grappling, and seeking to make sense of things" [13, p. 49].

The main principles of constructivism are as follows:

– reality is interpreted by every person according to their idiosyncrasy;

– the teacher is up to facilitating and moderating communication and active participation in the classroom;

– learning depends on the context, is individualized and is not based on closed learning objectives;

– the importance resides in the way that knowledge is transmitted [21].

The main categories of constructivism, according to J. C. Cronje, are the real world, reality, symbols, the human mind, human thought and meaning [3]. The real world is structured by individual minds on the basis of interactions, that's why learner's knowledge about the real world is not complete. Reality is personal as it is constructed by a learner, i. e. there are a plethora of constructed realities. "The human mind perceives and interprets the world by creating symbols. Human thought is imaginative, and develops out of perception, sensory experiences, and social interaction. Meaning is a construction that is the end result of an interpretive process that depends on the experience and understanding of the knower" [3] Symbols to construct reality are produced by people of a certain culture.

In constructivism, teachers are assumed as facilitators for the learning process while students try to construct their own knowledge and understanding and to set their own meaningful goals [24]. Constructivists acknowledge memorization and rote learning as learning forms [8].

So, the structures of knowledge are constructed by learners on the basis of their interactions. The teacher is a facilitator in the learning process. Learners are active. They make sense of things, construct their knowledge and set goals. There are a lot of ways to construct various versions of reality. The reality is personal. Meaning is constructed on the basis of experience, learner's understanding, culture and symbols.

Social constructivism. Social constructivism as a version of constructivism is primarily based on the theories by L. S. Vygotsky and J. Piaget and it is investigated by R. S. Prawat, A. Sullivan Palincsar, K. J. Gergen, R. Rorty among others.

A key principle of postmodernism is the notion that "knowledge is a social construct" [20, p. xiv]", all social phenomena have the constructed nature [5, p. 303]. The postmodern social constructivisms, which include the sociocultural, the symbolic, the social constructivist traditions as well as the constructivism of Dewey, "reject the notion that the locus of knowledge is in the individual" [17, p. 217].

Social constructivism or social constructionism, as K. J. Gergen described it [7, p. vii], "is grounded less in the social and political dilemmas … and more in the postmodern "linguistic turn" heralded by modern day philosophers" [17, p. 221]. According to K. J. Gergen, knowledge is located in language, in "temporary locations in dialogic space" [7, p. 30].

Social constructivism focuses "on the interdependence of social and individual processes in the co-construction of knowledge" [12, p. 345]. Social constructivist perspectives assume that "meaningful learning occurs when people are explicitly taught how to use the psychological tools of their culture (like language, mathematics, diagrams, and approaches to problem solving) and are then given the opportunity to use these tools to create common, or shared, understanding of some phenomenon" [19, p. 304].

Social constructivism sees cognition as a collaborative process [18]; "thought is internalized discourse, and the purpose of inquiry regarding cognitive development is to examine the transformation of socially shared activities into internalized processes" [10].

The radical version of social constructivism brings language rather than the individual or the external world to the fore. Language as a by-product of communal relation is "the carrier of truth" [17, p. 221]. A radical social constructivist perspective looks at language as a main psychological tool to gain knowledge. A concept can't be free from language, world exists because a community can talk about it.

In social constructionism, the educational focus is on the uses and abuses of discourse. "The problem with this approach is that it offers no way out of the language game – no way for the individual student to carry on a dialogue with the real world of objects and events." [17, p. 222-223]. Social constructivism fails to explain the problem of how the gap between the social world of language and the private autonomous cognition is bridged.

So, social constructivism looks at cognition as a collaborative process, thought as internalized discourse, cognitive development as internalisation of socially shared activities, knowledge as a social construct that is located in language. The locus of knowledge is the social, not the individual. Discourse is the educational focus. Social and individual processes are interdependent in the construction of knowledge. Learners are taught how to use the psychological tools to create common understanding; knowledge is located in language.

Theory of sociocultural development by L. S. Vygotsky. The theory of sociocultural development by L. S. Vygotsky emphasises the reconceptualization of "word meanings and concepts" and the role of reconceptualization in teaching [23, p. 248]. Language is seen as a tool of thought and cognitive activity [22, p. 33]. A qualitative gap between development and learning is "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more peers" [22, p. 33].

In accordance with the sociocultural view on teaching and learning, the role of a teacher is to guide the student's thinking process [23, p. 249]. Mediation is the basis of higher psychological processes. It can be of two kinds: mediation through a human being and mediation through an organized learning activity. Mediation between the individual learner and the material to be learned is carried out by a human being with the help of symbols [23, p. 17].

Learning is divided into empirical and theoretical. Empirical learning results in acquisition of spontaneous concepts whereas theoretical learning results in acquisition of scientific concepts. Scientific concepts are based on spontaneous concepts. Distinction between spontaneous (everyday, empirical, practical) concepts and scientific (academic, theoretical) concepts dictates the pedagogical means of sequenced instructional activity to develop student's understanding. In effect, the movement of the process of child's thinking development is carried out in the direction from social to individual [2, p. 53]. The learning of mother language is spontaneous speech development while the learning of a foreign language is not spontaneous, it is based on the semantics of mother language [2, p. 189-190].

Adaptation to environment is directed by needs. The needs and adaptation should be considered as unity [2, p. 54].

Therefore, the learner should reconceptualize word meanings and notions under the guidance of the teacher, who guides the student's thinking process. Mediation between the learner and the material to be learned is carried out through the teacher and organized learning activity. The major forms of education are adult guidance, collaboration with peers, empirical and theoretical learning. Scientific concepts can be learned theoretically whereas everyday concepts are learned empirically. Development and learning are two different processes and development follows learning. There is a gap between the actual development level and the potential development level. Adaptation to environment and needs exist in unity: adaptation is directed by needs. Language is a tool of thought and cognitive activity. The child development goes from social to individual.

Experientialism or an embodied realism. Experientialism or embodied realism is not a philosophical doctrine. As G. Lakoff and M. Johnson perceptively observe, embodied realism accounts for the meaning on the basis of empirical evidence [9]. There are nine types of empirical evidence for embodied realism: conceptual metaphor, "polysemy generalizations, inference generalizations, extensions to novel metaphor, spontaneous gesture studies, historical semantic change studies, psychological experiments, sign language analyses, and discourse analyses" [9, p. 251].

The major concepts of embodied realism are meaning, embodied meaning or body-based meaning, mind, thought, experience, sensorimotor system, sensorimotor and cognitive structures, neural circuitry, sensorimotor experience, conceptualisation, reasoning, body, organism, environment, interaction, cognition, language, evidence, conceptual metaphor, representation, the corporeal logic, to name a few. Rapid developments in cognitive neuroscience show that "meaning is grounded in our sensorimotor experience and that this embodied meaning was extended, via imaginative mechanisms such as conceptual metaphor, metonymy, radial categories, and various forms of conceptual blending, to shape abstract conceptualization and reasoning" [9, p. 245]. Meaning comes, not just from internal or external structures of the organism, not from the subject or the object, but rather "from recurring patterns of engagement between organism and environment" [9, p. 249]. Evidence suggests that "experience is the result of embodied sensorimotor and cognitive structures that generate meaning in and through our ongoing interactions with our changing environments" [9, p. 249].

Experience is "an interactive process, involving neural and physiological constraints from the organism as well as characteristic affordances from the environment and other people for creatures with our types of bodies and brains" [9, p. 249]. This is an idea of embodied organism-environment interaction. "The same neural and cognitive mechanisms that allow us to perceive and move around also create our conceptual systems and modes of reason" [11, p. 4]. "Once we have learned a conceptual system, it is neurally instantiated in our brains and we are not free to think just anything" [11, p. 5]. "The mind is not merely embodied, but embodied in such a way that our conceptual systems draw largely upon the commonalities of our bodies and the environments we live in" [11, p. 6]. According to G. Lakoff and M. Johnson, mind, meaning and thought are embodied. Embodied realism "is the view that the locus of experience, meaning, and thought is the ongoing series of embodied organism-environment interactions" [9, p. 250]. A human being first acquires "the bodily and spatial understanding of concepts" and later understands "their metaphorical extensions in abstract concepts" [9, p. 254-255].

The logic of abstract thought is based on "the corporeal or spatial logic, arising from bodily experience" [9, p. 257]. An embodied account of "syntax, semantics, pragmatics, and value is absolutely necessary for an adequate understanding of human cognition and language" [9, p. 245].

Like traditional philosophy, G. Lakoff and M. Johnson maintain that the world is real; reality imposes constraints on concepts; conceptualisation exceeds the boundaries of internal reasoning and logic; knowledge about the external world is possible.

Unlike traditional philosophy, human reasoning is possible due to the fact that a human has our type of body and brain; reason develops due to the nature of the organism as well as individual and collective experience, genetic heredity, environment, the ways of functioning in the environment, the nature of social interaction and so on.

So, mind, meaning and thought are embodied. The learner first acquires bodily and spatial understanding and later metaphorical understanding. The abstract thought logic is based on the corporeal and spatial logic. The same neural and cognitive mechanisms are involved in perception, movement, conceptualization and reasoning. Organism-environment-people interaction produces experience and meaning. Metaphors are conceptual, not linguistic.

Thus, the choice of educational perspectives and the forms of education remain critical for online education to guarantee its effectiveness. Leaning problems are approached from varied theoretical perspectives. Affordances of information communication technology enable faculty to migrate the face-to-face courses into an online environment. An eclectic approach to teaching and learning could combine a traditional educational perspective with constructivist, social constructivist, sociocultural and experientialist perspectives.

The major forms of education are teacher guidance, collaboration with peers, empirical and theoretical learning. Essential components of education are language, teacher, learner, culture, social interaction, the structured activity of instruction, teaching methods, assessment of the evolving cognitive capacities in students, feedback and remedial activity. Changing environment, recurring patterns, memorization and rote learning contribute to education as well. Language is a tool of thought and cognitive activity. The teacher is a facilitator in the learning process. The teacher guides the student's thinking process, ensures that students achieve a certain level of competence in foreign language and gauges their progress. The learner is active in gaining knowledge. Learners make sense of things, construct their knowledge, set goals, reconceptualize word meanings and notions. Mediation between the learner and the material to be learned is carried out through the teacher and organized learning activity. Learners are taught how to use the psychological tools (language) to create common understanding. The learner first acquires bodily and spatial understanding and later metaphorical understanding. Metaphors are conceptual, not linguistic. The learning of a foreign language is both theoretical and practical. Scientific concepts are learned theoretically whereas spontaneous concepts are learned through experience.

The major categories of education are discourse, language, cognition, knowledge and meaning. Discourse is an educational focus. Thought is seen as internalized discourse. Reality is a personal concept as every person constructs their own version of reality. Cognition is a collaborative process. Cognitive development is the internalisation of socially shared activities. Knowledge is a social construct. The locus of knowledge is the social, not the individual. Social and individual processes are interdependent in the construction of knowledge. The structures of knowledge are constructed by learners on the basis of the interactions of the organism with environment and people. Meaning is constructed on the basis of experience, understanding, culture and symbols. Meaning and thought are embodied.

People are not free to think anything as the same neural and cognitive mechanisms are involved in perception, movement, conceptualization and reasoning. The abstract thought logic is based on the corporeal and spatial logic.

The selection of learning theories to improve conscious instructional design results points the way for future research.

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