PEDAGOGICAL ASSUMPTIONS OF TRANSFORMATIVE DIGITAL MODEL FOR SOCIAL CHANGE

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Abstract. *Creating of digital models which transform learning and its outcomes, as well as the learner's educational, developmental and educative achievements has become vital to provision of inclusion possibilities in a networked society. Researchers have produced several frameworks of using digital technologies in education, but these are generally do not appropriately incorporate socio-contextual perspectives. To explore this area and create a transformative model of teaching-learning at higher levels of education in Special pedagogy and social work an appropriate pedagogical provisions are needed to transform educational process as a system including: (a) meaningful and transforming objectives, (b) adequate for digital learning and leading to social change pedagogical principles, (c) reflectivity with the domain of knowledge creation, (d) self-evaluation of learning and social inclusion, (e) transformations of teacher/educator activities towards social inclusion and knowledge share, as well as collaborative learning in organizational settings of emerging knowledge society.*
This study, focuses on tertiary education and doctoral investigations, reviews the literature on facilitated by transitions social changes, and introduces a theoretical underpinning of digital learning within a pedagogical model. The dominating method is theoretical analysis that includes reviewing, analysing and synthesising literature on the theme "in an integrated way such that new frameworks and perspectives on the topic are generated" (Torraco, 2005, p. 356; Hamilton & Torraco, 2013). The article introduces the theoretical approach to the project "Implementation of Transformative Digital Learning in Doctoral Program of Pedagogical Science in Latvia" and "Gender aspects of digital readiness and development of human capital in region".
Keywords: *transformations, digital learning, social change, pedagogical model, tertiary education, doctoral investigation.*

Introduction: new roles of technologies or changing pedagogy?

The answer should be among (a) the presence of technology in pedagogical processes that causes a crucial restructuring of learning environments; (b) educator's professional philosophy and capacity for thoughtful, reflective, and

flexible activity in assisting learners; (c) incorporated effective technologies into a variety of methodologies when methods of learning are chosen or agreed upon by learners; (d) students' and learners' personal empowering due to digital competence allowing for transformed mutual relations and, therefore, pedagogy that facilitates deep, strategic and personalized learning in educator-student collaborative teams. Pedagogical reasoning of technologies is often derived from vastly different philosophies related to beliefs about how learners learn, or how learning occurs. However, education has to follow this reality: it may ban the use of digital technologies but they are far from free of technological thinking that is increasingly caught up in the vortex of the technological revolution (Glandinning, 2018). Educators are relegated to a relatively small role of a monitor, facilitator or, if needed, organizer of learning; and this circumstance makes their digital competence special. The use of technologies challenges the dominant mode of learner learning-centred educational process by making it more personalized and inquiry-based in varied forms of collaboration and use of resources (Brunner & Talley, 1999, p. 27); students' desire for independence cought by the transformation flux calls for an adequate digital culture in higher education and in doctoral research (Rubene & Strods, 2017).

The term 'digital learners' (Gallardo-Echenique, 2015; Rapetti & Cantoni, 2010) suggests a global vision of the twenty-first century learner and does not exclude using traditional sources of knowledge and valid research tools; rather it allows for focus shifting in education to use less time to consume training, shorter attention spans for learning (Penfold, 2016), they cooperate and communicate differently, have a different sense of authorship and use different language (Gibbons, 2007). Influence of the digital devices is so vast that it is time to consider doctor students, adults' and educators' beliefs about the role of ICT in education and research. The challenge is to use it appropriately so that students learn *with* the computer, not just *from* it.

The end of the 20th century was marked by a changed image of sciences and new rationalism with characteristics which are not in compliance with the previous concept of education: the transition from the accent on knowledge in the development of sciences moves to humans' development in their cultural context that is created by humans and considerably changing under the influence of digital technologies being in humans' mind and hands. Pedagogical optimism allows for illustrating challenges by extracting a couple of visions for 2025 (Thomson Reuters, 2014): (a) neuroscience along with increased understanding of the human genome will allow for early prevention of neuro-degenerative diseases, like dementia; (b) everything from cars to appliances to individual personal items will be digitally connected, therefore, create a new social networking and mutual relations. These and other people's desires can be achieved by competent and responsible researchers and practitioners who make this innovation topical when

the old scheme, I know where I am going, and know how to get there' will not be valid any more. It is not only a sign of the human nature to want to know what is coming; it is education that does its best to zoom the future developments and challenge understanding of new learning modes.

The doctoral formal and adult in-formal education programs are undergoing transition towards better understanding and learning with digital technologies in acquiring higher level competencies that will enable the new generation of researchers and practitioners achieve rich intellectual properties to identify the themes of emerging importance. They should be prepared to expertise the fields of human activities, create sustainable environment appropriate for living, as well as responsibly protect it from men's damaging inventions. Framing of key competences for the 21st century suggests that while society has produced large amounts of knowledge and complex global challenges, it lacks the capacity to respond to this challenge including new modes of learning (Lotz-Sisitka et. al, 2015, 73); therefore the educative role of education becomes decisive with much attention to social changes, science, sustainability and growing digital possibilities.

Transformation towards the Knowledge Society being based on technological breakthroughs is even more revolutionary, as it changes the fundamental processes of adult communication, cognition, perception, mutual relations and identity construction that provide the competence creation as a foundation for social life. "At present, we are not only changing the tasks and division of labour between the different components of educational systems. We are also changing learning itself" (Tuomi & Miller, 2011, 1).

The content-structural dimension of a doctoral and adult education programs can be implemented by interconnected components of human cognitive, emotional, communicative and informative-technological culture; that is represented by the pedagogical action-procedural dimension in mutually integrated motives, goals and criteria, tools and organization, academic outcomes and personal achievements, self-assessment, self-evaluation, assessment and evaluation. Having into consideration that the core feature of competencies is a responsible meaningful usage of knowledge that manifests itself in human sense-making activities, in science of pedagogy a phase or cycle of action can be treated as a unit of research.

The driving impetus of the two projects will be to rethink teaching and learning in relation to a digitalized and globalized society in which humans break traditional boundaries, share agency and decision-making power with intelligent systems enabled through machine learning. Emphasis on human-machine collaboration, cognitive and social augmentation is also of topical importance. The story is not so much about technologies; it is about humans with technologies (Coombs, 2018).

Changing functioning of education

"Society not only continues to exist *by* transmission, *by* communication, but it may fairly be said to exist *in* transmission, *in* communication" (Dewey, 1916, 5). Alongside with the function of adapting, integrating and keeping social balance, education is also a future-oriented agent of change that introduces a certain dis-balance; it is, therefore, supposed to generate and facilitate problem solving and innovation for social progress. Diversity in all spheres of human life makes societies dynamic and education allows them for surviving in the rapidly changing world.

"New modes of value production will transform both the industrial system of production and the societal requirements for education"…"In the Industrial model value was essentially generated by extracting it from nature" while in the Post-industrial era the model itself is being created by creating value. This can be seen as the essence of the Knowledge Society. Value is created by creating meaning that in its turn is defined as the difference between what we already understand and what we learn that we do not understand yet. Such value creation process could be called learning and Knowledge Society, therefore, could be called Learning Intensive Society (Tuomi & Miller, 2011, 7-8).

These changes and contradictions generate a tension that calls for different dominating values and forms of educational settings. "Two key factors, therefore, shape the evolution of educational systems" (ibid, 3): (a) although the key social functions of education remain the same over time, the concrete implementation of educational processes generates institutions that start to live their own lives and which are creatively "misused" for novel purposes, therefore, do not depend on their effectiveness for education; (b) the concrete implementation of educational change depends on pressing social needs, available tools and concepts; therefore the social actors develop education based on the currently perceived challenges and problems.

These contexts itself is a product of cultural evolution that makes education focus more on informal learning. All the observable and emerging changes in value creation call for adequate approach to capability including reflection, metacognition, process and achievement evaluation by following appropriate criteria with dominating peer and self-evaluation and, consequently, with higher value of inquiry-based learning and ethical principles when students "engage fully in technology-rich learning environments" (Blayone et.al, 2017). These add to the educational content and cause changes in pedagogy still remaining an organizer of learners' success.

Alongside with the growing role of digital technologies and informal education, especially at tertiary and doctoral levels, education to a considerable extent becomes focussed on developmental and educative effect of evaluation that

is implemented by a new balance between students' sense of freedom and educators' assistance in coordinating their creative learning. Meanwhile, a pedagogical process still preserves face-to-face communication as a human mode of value exchange in spite of obtaining stronger accent on learner autonomy by wider functioning of digitally provided educators' guidance. Adequate educator's organizational assistance focussed on the learners' personalized achievements and based on creative information process is a sign of deep and strategic learning when the social, emotional and cognitive processes of learning change and in their new quality still remain a fundamental mode of human meaning-creating existence inside and outside the formal education.

The digital learning that to a large extent steps in instead of printed sources interferes with the learning content structures, re-shape the process and in a new way provide possibilities of view exchange in a sense-making communication that allows for speedy knowledge internalization and externalization, enable quality learning by accent shifting among cognitive processes like rapid expansion of concepts, transfer and understanding of cultural values.

An important consequence in the development of science of pedagogy is the recognised new quality of its traditional research object being inner dynamic links of a pedagogical process and mutual relations that now is affected by: the learner subject's position in meaningful pedagogical settings with growing accent on personalised assistance in learner development, evolving collaborative learning in value-making organizational situations and collaboration among the participants that are strengthened in educator-student team-based research within the global information and communication networks now being an important learning environment that considerably interferes with the individual's perception, conceptions, understanding, views and mutual relations.

Activity theory

Pedagogy is a science and practice of action/activity and follows the conception that humans develop their faculties in diverse activities, and these can be offered by education. Vigotsky's (1978) and Leoniev's (1978) theories with the accent on human development in educational action (practical, mental, social; formal, informal or non-formal) and activity being a measure of intensity make a background of an individual's development. This article addresses several basic statements for further detailed descriptions of implementing a learner learning-centred paradigm in doctoral research and adult education.

An action begins with an active, motive's driven and goal-directed human agent to transform the object of his/her activity. The learner's experience transformed in this activity returns at a new level in his further activity/learning. The intensity in which an action takes place depends on his/her needs/motives and

individual ability of performing the desired action according to his/her will and vision of a goal, by using tools as a link between the environment and human consciousness. Learning is a specific action because of its object that actually is the learner's self, his/her qualities to be transformed: experience, mental and physical abilities, and culture-oriented values. The target is also specific: in subject- and teacher-centred paradigms the object and the target use to be perceived as synonymic, and this introduces a serious pedagogical mistake that manifests itself in obstacles for learners' freedom to learn and becoming a responsible decision-maker of one's learning.

The above mentioned theories elaborated the concept of links between human and tools that are chosen to reach the goals; it is important to identify that the chosen tools on the one hand inform of the learner's learning experience, on the other, the most important for education, tools offer the learner opportunities to extend and further develop his/her capacities. The object (self) also shows the learner's experience and interferes with the quality of learning and the achievements.

The object being a phenomenon of a learner's self invites the individual to find out its essence, developmental opportunities and possibilities that in their turn inform the learner of appropriateness of tools to be consciously chosen. Vygotsky's theory brought individuals, as active agents, together with other agents and the cultural-social environment. Through their actions and communication, humans enter into a relationship with the environment of mental and practical objects created by other humans, the nature, as well as a relationship with a community where an individual meets values and norms of attitudes. Mediation between an individual and the tools pays attention to the learner's cognitive activity and social construction of the individual's mind, ability to restructure his/her experience and share values with the partners. This is also a mechanism that constitutes the basis for collaborative digital learning/research in educator-learner teams by claiming the need to identify and provide a possibility to conceptualize an action-based human – technologies dialogues across contexts and organizational settings. Within this conceptual frame human-technology interactions in education should be focussed on the learner actively addressing (opposite to passive acceptance) the objectives. Action in education distinguishes between learning how to use digital technologies and learner's empowering by digital technologies when these considerably add to the quality of action, its formal/academic outcome and what is the most important – to new personal achievements (educative, education, developmental). Gibson (2001, 44-45) considers that almost all field of education can be viewed as comprising a mixture of two purposes: (a) instrumental education is that in which the learner acquires new knowledge or skills for the purpose of being able to do something; (b) transformative education is that in which the learner participates in a process for

the purpose of changing in some important ways as an individual human being or member of a community.

The dimensions of an action to consider in the context of digital technologies:

1. Structural – (a) subject of action, in this context being a learner/researcher with a certain digital competence; (b) object (learner's capability) that is supposed to be improved and which does or does not contain any quality added by digital technologies; (c) tools being used to intermediate subject and object by applying physical and mental energy affected or not by digital equipment.

2. Procedural – (why?) motives and aims; (what?) content of learning/research that is supposed to acquire, like understanding, competences, values etc.; and (how?) - appropriate methods or types of activity to reach the goal in many organizational contexts, inter-connecting activity structures, varieties of collaboration and contexts of cognitive, practical, social activities.

Further considerations focused on the action level suggest four sub-systems of digital-mediated action: (a) relating to building and maintaining human-machine pairings - meta-functional, technical and operational; (b) mediating cultural expression address internalization and externalization largely determined by rules and values of participating communities; (c) automatization of actions by reducing them to formal procedures (algorithms) run by a machine; (d) the most complex sub-system addresses digitally-mediated collaboration.

Functioning of digital technologies in a pedagogical process deserve a special consideration in its structural, processual and action level dimensions. Finally, a pedagogical process includes evaluation (according to the action theory action expires in its outcome); this component also goes through transitions in a learner learning-centred process – evaluation introduces the process by identifying the learner's individual capability for learning, is being continued through the process and reaches the final evaluation of the outcomes. Self-assessment and self-evaluation are of greater importance if compared to external evaluation; these introduce considerable changes in organizational settings of education and the changing role of technologies. Assessment *for* education (if compared to assessment *of…*) is an integrated approach to instruction and curriculum that supports students' learning "to move beyond the basics that are learned and transfer that knowledge to other contexts beyond the one in which the original knowledge was learned" (Gordon Commission, 2012). Therefore we have to distinguish between evaluation of the academic results and learner's individual achievements; learning processes and goals can only change if assessment changes (OECD, 2010).

Transforming pedagogical process from dominating instruction to

dominating learner possibly autonomous learning leads to an assumption that digital technologies transform internal dynamic connections of a pedagogical process that manifest themselves in transformed nature of mutual relations between the educator and doctor student. Technologies impact understanding of pedagogy as a science, its object of investigation (more in Žogla, 2017, 2018), pedagogical process by transforming assessment (Redecker et al., 2013; Gordon Commission, 2012), allow for supporting students with and without disabilities (Rao et al., 2015), on-line problem-based pre-diploma education (Barber et al., 2016) etc. Addressing the action approach justifies the assumption that digital technologies create a new, up-to-date pedagogy (to be further developed in the projects mentioned in the acknowledgements).

Theories of deep and transformational learning

Technology on its own may not improve student achievements, this research might help us understand how technology creates opportunities under which there is a positive effect on students' achievement (scientific research is a new experience of a doctor students to acquire); transition from lecturing and demonstrations to assisting doctor students' scientific exploration and discovering new knowledge with incorporated open-ended assignments is a vast object of investigation where transformation meets with deep and strategic learning and where 'technology plays a catalytic role in opening the minds' of educators and students to new ideas about learning and their own role in the education process (Dwyer, 1996, p. 25-29). Transformative pedagogy is that in which the learner participates in a process for the purpose of changing in some important ways as an individual human being and a team member while assessment emphasizes both the development of 'whole brain' capacity and capability for collaboration.

Educators have to distinguish between their competencies: in knowledge instruction settings technology takes a role of a tutor while in knowledge construction it takes the vastly different role of a tool; students learn not only *from* technologies but do this *by* technologies - student's and educator's freedom in collaboration, conversing and solving problems under a pressure of the digital technologies introduces a new 'pedagogy of learning' (Gibbson, 2001, 41-42) - to be investigated.

The transformation, deep and strategic approach theories of learning are significant and may be considered for learning and research of doctor students.

Transformation theory (Mezirow, 2009; Taylor et al., 2012) describes changes in operation of a number of elements that relate to a multiform learning process empowered by digital technologies while the deep approach theory in higher education (Biggs & Tang, 2011; Howie & Bagnall, 2012; Entwistle, 2009) is appropriate for doctor students' academic and research achievements; among

the main there is the ability of independent, critical analysis, synthesis and evaluation.

The deep learning theory in practice will lose quality and the learners will underachieve without 'learning about learning', in other words, without reflection and thinking on learning. Deep approach theory is the theory that is cognate when integrated with transformation theory because both theories related to learning are profound in the impact on the learner and allow for the learners' genuine engagement with the subject matter and ways of learning in order to generate meaningful interpretations; this involves in higher order thinking as something of value to them and their lives (Biggs & Tang, 2011)

After transformation individuals see themselves and the world in more effective manner, because their assumptions and outlook are modified to better fit their real context. Modifications of these theoretical structures are common in the literature (Howie & Bagnall, 2012) and characterizes a transformative learning process; ongoing nature of experiments in a wide variety of situations. Among these there are: experiencing a dilemma and ability to identify topical problems in theory and practice on the background of critical thinking and strategic knowledge; self-examining and reflectivity or thinking about learning and adequacy of achievements; reintegrating new perspectives and capacities into one's life on the basis of conditions dictated by the new perspectives etc.

The discussion focusses on several assumptions to underpin the models:

Change for the learner-centred process means changing for the humanistic educational paradigm to transform mutual relations - transition of the learner's position from an educational object or passive information receiver to a person in the capacity of educational subject capable for self-education and self-improvement. The main purpose therefore is building a learner's value system and individual meaning as a value being strengthened in communication by culture-oriented content of education and adequate organizational settings.

Digital technologies change their position from that of a tool to an agent of educational change, educators' belief shift towards value-creating learning. Technologies change pedagogy by essentially collaborative learning and research, accentuate capability development for autonomous learning and transversal skills (Council of EU, 2006), prioritize and enable functioning of self-assessment.

Deep transformative learning theories underpin acquiring of reflection, development of critical thinking, strategic knowledge, and competences for life-long learning that is in compliance with the research object of pedagogical science and its core – inner constant links of a pedagogical process and mutual relations; these are appropriate for investigation of the under-researched education for social changes in the context of rapidly growing impact of technologies and digital learning, personalized support to learners who need special assistance for successful learning and individual development.

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