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Ecologies of Openness: Reformations through Open Pedagogy

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ABSTRACT:

Ecologies of openness—inclusion, intersections, and interstices—raises questions about the concepts of open, openness, opened, and opening, throughout educational contexts. The rise of openness and open pedagogy has impacts on educational paradigm shifts and university reforms in open and flexible learning. The focus of this article is to present an overview of different current frameworks for open education that will serve to introduce readers to contemporary open education frameworks and to present different dimensions of open. The literature includes current reports by the European Commission, scientific journals, and blog posts by scholars since 2015to the present. Reports by UNESCO and those related to the fourth industrial revolution are examined. In addition, the article builds on the authors previous research in the field, which also includes leadership and quality related to openness. To set the scene the following section briefly introduces current global trends and challenges in education in the 21st century. After that open pedagogy are presented; the open education framework by the European Commission, and ecologies of open pedagogy. The article ends with conclusions and recommendations.

Keywords: Openness, pedagogy, paradigm shift

1. INTRODUCTION

If we teach today's students as we taught yesterday's, we rob them of tomorrow. John Devery

Learning is ubiquitous, as it takes place in all means, at all time and everywhere. Learning today can take many forms, such as formal, informal and non-normal and take place anywhere and anytime. Whoever we are, wherever we live we are presented with opportunities to learn every day of our life**.**

The world is rapidly changing with many global challenges. The most prominent challenges for education today and in the near future are globalization, technological innovations, climate change, demographic changes, and digitalization. Schwab (2016) argued that the fourth industrial revolution has led to new demands and opportunities to which individuals and societies need to respond because they will fundamentally alter the way people live, work, relate to one another, and learn in formal and informal settings. In line with this revolution, there are calls even for a social revolution, including social, emotional, collaborative and emphatic competences, attitudes and values. Accordingly, the task of education is not only to transfer knowledge and skills, but also to teach people how to create knowledge, which is a source of competitiveness and prosperity for the public

and a crucial economic resource.

2. CURRENT GLOBAL CHALLENGES AND TRENDS IN EDUCATION

The United Nations Educational, Scientific, and Cultural Organization (UNESCO)Sustainability Goals (SDG), specifically SDG4,has emphasized and fostered global, lifelong, and life-wide learning. UNESCO's mandate stipulates that education should be available to all at anytime, anywhere, and through any device(UNESCO, 2015a, 2015b, 2015c). Its SDG4 goals are designed to empower and ensure inclusion, equity, equality and quality in education, designed to be achieved through access, democracy, affordability, efficacy, and lifelong learning, or ongoing learning (S. Järvelä, October 25, 2018). Other challenges both in education and society include the influences and use of blockchain, 3D, the Internet of Things, cloud computing, artificial intelligence, learning analytics, robotization, and other developments in technology-enabled and social and mobile learning. Additionally, education is facing the growing trend toward micro-credentials and the need for micro-learning in workplaces and in continuing professional development. Hence, there are urgent calls for modern governance, as well as extensive and agile university reforms with dynamic, proactive leadership and management; and innovative inclusive open pedagogical approaches. The director general of UNESCO, Irina Bokova, stated already in 2016,the following:

"*[A] fundamental change is needed in the way we think about education's role in global development because it has a catalytic impact on the well-being of individuals and the future of our planet. . . .Now, more than ever, education has the responsibility to be in gear with 21stcentury challenges and aspirations and foster the right types of values and skills that will lead to sustainable and inclusive growth and peaceful living together"* (UNESCO, 2016).

The European Commission, Committee on Culture and Education (Łybacka, 2018) argued that the value of modern human capital derives from intellectual potential, the ability to adapt to changes in the environment, a pro-innovation attitude and an openness to risk. Modernization of education has according to Łybacka (2018 p. 29) been guided by three main axiological assumptions:

1. The traditional place of learning, i.e. the school [university], is now complemented by the many other sources of information available. Modern technologies have liberated education, created opportunities for multidimensional educational activities, and established an EDUCATIONAL SPACE. A major challenge is to ensure that schools[university], are the most interesting place in this space.
2. The role of education systems is to mold a well-rounded PERSON who is capable of self-realization in his or her professional, social, cultural and civic life in a diverse, global environment.
3. Human development requires not only security, for which states are willing to spend money and create defense pacts. A prerequisite for successful development is a CIVILISATION PACT based on inclusive, high-quality and [adequately] funded education systems.

Moreover, Łybacka (2018) argued that higher education plays a crucial role in developing the potential and competitiveness of the European economy. The level of education, social entrepreneurship and pro-innovation attitudes are the guarantors of the success. The knowledge triangle, and to improve the links between research and education have to be strengthen. Łybacka (2018) also emphasized that higher education must be much more flexible and open, facilitating the transition to different levels of education, providing for the recognition of non-formal and informal learning, and

using different forms of curriculum implementation, including through the use of new technologies which make it possible to focus on students, and to carry out interdisciplinary programs. The European Commission (EC) even recognized the potentials of the digital age, emphasizing that regulatory barriers need to be overcome (EC, 2017).

3. UNIVERSITY REFORMS

The rise of the unbundling paradigm, in many sectors in the society as already in film, music, booking systems etc., and with a start in education with the enlargement of opening up education will challenge many traditional assumptions and practices by expanding conventional delivery modes, promoting new innovative learning designs, empowering open pedagogy, implementing new business models, and outsourcing for example career guidance, library resources, and student support services (Conole, 2014; EC, 2013; Inamorato dos Santos et al, 2016; Watters, 2012).Today's challenges cannot be solved by individual countries, research groups, or scientists. Instead, such challenges require that countries, industries, organizations, and researchers in different fields cooperate, network, conduct experiments, and work in a less linear and more agile manner. Seamless solutions with high levels of resiliency are thus required. Accordingly, there is an urgent need for reforming and transforming education according to Łybacka (2018),as well as empowering ecologies of openness, which include inclusion, intersections, and interstices. This transformation not only requires adaptation but the ability to predict, but more to be proactive in response to constant change and the ambiguous roles of policy and educational research (Adams et al., 2017; Jemni et al., 2016; Jhangiani& Biswas-Diener, 2017; Sharples et al., 2016). As such, the main questions in the 21st century of why, what, who, for whom, related to learning require innovative answers, considering ecologies.

Universities throughout the world are starting to rethink and change what they teach and how they teach to reflect teaching and learning in the digital age and the blurring of traditional boundaries between formal and informal learning (Ossiannilsson, 2017a2017b, 2018; Ossiannilsson, Altinay, &Altinay, 2016a; Siemens, Gasevic, & Dawson, 2015). They are also seeking to expand their access and increase their openness and flexibility to attract and retain a broader range of students than ever before. Therefore, it is time to remember the main role of universities, which is to educate their learners to solve complex global issues today and in the unpredictable future. It is obvious that today's groundbreaking research rarely follows the classical academic disciplines, but instead cross-disciplinary. Hence, to addresses these challenges, uncertainties, and changes of our time, institutions and organizations need to find new ways of working, experimenting, and interacting with the community at all levels, locally, nationally, and globally with a more agile and seamless approach, focusing ecologies, intersections, and interstices. The academic world is no exception.

At least three urgent questions must be addressed in facing these global challenges: First, "What technology should be used to create solutions to today's most important challenges– globalization, the aging population, climate change, increased digitization, and changed demography?" Second, "How do schools and universities equip people for this age of uncertainty and unbundling in order to tackle the major challenges we face today?" Third, "How do we educate people when no one knows which professions will exist in the near future or what skills will be needed, especially when new knowledge is increasingly emerging and developing outside the universities?" Young people need to be prepared not only to be economically viable contributors to increasing the gross domestic product(GDP) but also to become thoughtful global citizens who find creative and ethical solutions for the new and interconnected challenges of the 21st century

(Gil-Jaurena& Domínguez, 2018).

Universities must thus empower ecologies and culture of open pedagogies. Hence, business models, reforms, and organizational structures of universities must change as well as management and leadership in the digital era. Capacity-building and cultivation of a culture of quality and openness are therefore critical issues in this transformation. Equally, a new understanding of quality (Kear et al., 2016; Ossiannilsson, Williams, Camilleri,& Brown, 2015) must be considered in moving away from a mechanistic, "tick-box" approach toward quality models tha temphasize learning processes, learners´ engagement, analytics, outcomes, faculty engagement, and, most of all, their effects, and impact on individuals, organization and the society. In addition, skills, competences, and attitudes in and for the 21st century must be reflected in course designs, offers, services, and outcomes (Ossiannilsson, Altinay, & Altinay, 2015). New delivery tools and resources for learning must be continuously developed in response to technological developments and increased digitization. Furthermore, in ecologies of openness, open pedagogy, learning outcomes, evaluation and assessments should emphasize 21stcentury competencies and capabilities, and not just content. The focus on learning outcomes that are fact- or subject-related should be extended to include higher order thinking (i.e., metacognition)as well as the skills and competences needed for life and work, such as flexibility, adaptability, initiative, self-direction, social and cross-cultural awareness, productivity, accountability, entrepreneurship, leadership, and responsibility (Bishop, n.d).

4. OPEN PEDAGOGY: THE SUPPORTING LITERATURE

A review of the issues of open pedagogy follows. The literature has been drawn from current discourses and internationally recognized models in the field, among them the European Joint Research Centre's recently developed framework of open education and includes online resources (Science Direct and Google Scholar), hard copy journals, and reports as well as various repositories such as open access sources published between 2015 and 2018. The following topics are addressed: A framework for open education; ecologies of open pedagogy; open content; open leadership, and quality in the era of open education.

One of the main sources for this article is the recently developed support framework for open education by the European Joint Research Center (Inamorato dos Santos, Punie & Castaño-Muñoz, 2016).

I. A FRAMEWORK FOR OPEN EDUCATION

The Cape Town Open Education Declaration, 10th Anniversary (2017) points to ten directions to move open education forward. One of them is related to open pedagogy. The others are related to communicating open, empowering the next generation, connecting with other open movements, open education for development, thinking outside the institution, data and analytics, beyond the textbook, opening up publicly funded resources, and finally copyright reform for education.

The European Commission's Joint Research Center has developed a support framework for open education that could be applied worldwide (Inamorato dos Santos, et al., 2016). The framework comprises 10 dimensions (Figure 1). The 10 dimensions are divided into four transversal dimensions: strategy, leadership, technology, and quality. The six core dimensions are access, content, pedagogy, recognition, collaboration, and research. For each dimension, the framework includes the definition, rationale, and components. The four transversal dimensions influence not only each other but also the six core dimensions. The latter dimensions are mutually dependent, and they both empower and limit each other. The framework promotes a holistic approach to open education, thus emphasizing the empowerment of ecologies. It encourages

reflection and consideration in all dimensions to determine both the strengths and the weaknesses within an organization or institution.

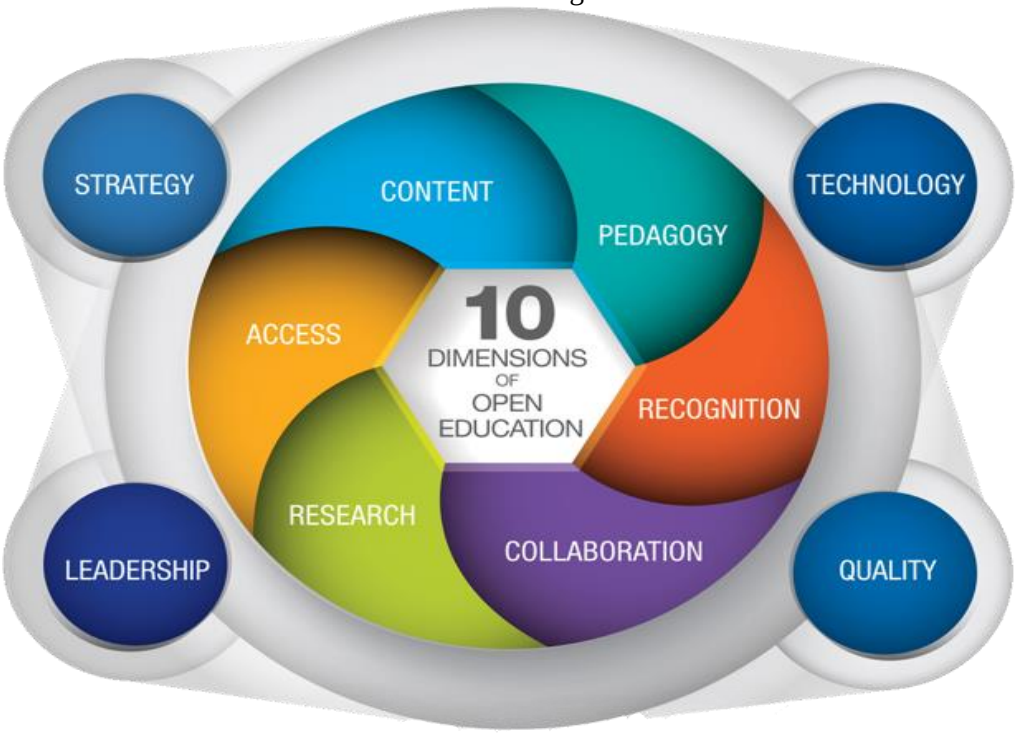

Fig. 1. The framework of open education
(Inamorato dos Santos, Punie, &Castaño-Muñoz, 2016)

Some examples can be mentioned; leadership influences and has implications for institutional strategies, quality considerations, and selection and use of technologies. Moreover, leadership has implications for pedagogy, content, access, research, collaboration and recognition. An open pedagogical approach empowers the use of open content, access, collaboration and open scholarship. This can be elaborated for each of the ten dimensions, they are all interrelated.

Weller (2014) examined four key areas that are central to the development of open education: open access, massive open online courses (MOOCs), open education resources (OER), and open scholarship. Exploring the tensions in these key arenas, he argued that the ownership of the future of openness is significant to everyone who has an interest in education. In a study by D'Antoni (2008) raising the awareness of open education was identified as a key issue by many stakeholders. Furthermore, issues such as copyright, quality assurance, research, and policy were not well represented in the data. D'Antoni found that the three highest-ranked priorities for opening higher education institutions were research (81%), learning support services (74%), and awareness-raising (71%). Capacity development was ranked fifth (66%), and communities and networking were ranked 11th of 12 (54%) (D'Antoni, cited in Stagg, 2017).Open research plays an essential role in ecologies of openness (D'Antoni, 2008; Stagg, 2017: Weller, 2014).

Although, both Inamorato dos Santos et al. (2016) and Weller (2014) emphasized a holistic approach in their frameworks of open education and argued for ecologies, this review will highlight and elaborate especially two of the transversal dimensions, leadership and quality, and besides the core dimension pedagogy, content will be somewhat elaborated as several researchers as Blessinger (2016), Bossu, Bull and Brown (2016), Inamorato et al., (2016) and Weller (2014) argued that OER, MOOC, and open

licensing are considered as crucial in open education and open pedagogy. In the next section ecologies of open education will be elaborated.

II. ECOLOGIES of open pedagogy

Inamorato dos Santos et al. (2016, p 26) argued that:

"Openness in pedagogy refers to the use of technologies to broaden pedagogical approaches and make the range of teaching and learning practices more transparent, sharable and visible".

Furthermore, they argued that:

"Opening up pedagogical practices is about developing the design for learning so that it widens participation and collaboration between all involved. Pedagogical approaches with an emphasis on the learner are very suitable for open education. The goal is to open up the range of pedagogical practices via [Information and Communication Technology (ICT)] in order to enhance the effectiveness of learning design and increase students' involvement and collaboration. It is also about making pedagogical practices visible, transparent and accessible, by making available the rationale for learning design, the assessments and learning outcomes. It also enables learners to design their own learning path by offering them a wide choice of learning resources".

Although a key pillar of open education and open pedagogy, open content alone is not enough to make open resources readily accessible and available. As discussed throughout this article, ecologies of open pedagogy must be developed to foster both Open Education Practice (OEP) and a culture of openness (Open Educational Culture, OEC), which also is described in the European project concerning the move from *OER* to OEP by Conole (2012), and Stracke (2012), the Open Quality Initiative (OPAL) project. Later Innamorato dos Santos et al. (2016) argued that it is important to empower not only the use of OER but also OEP in the creation of a culture of openness.

Despite the research on and capacity-building potential of OER, barriers still remain to the widespread engagement with open education practice and a corresponding culture. The framework for open education by Inamorato dos Santos et al. (2016)is associated with the concept of open pedagogy described by Hegarty (2015), whose open pedagogy model is based on connectivism described by Siemens (2005, 2017) and on the findings from the OPAL project, concerning the move from *OER* to OEP (Conole, 2012; Stracke, 2012). Based on the findings from the OPAL project, Conole (2013) argued that that open tools and processes should be grounded in five principles that are necessary for OEP:

i. Collaboration and sharing of information,
ii. Connected communication about learning and teaching,
iii. Collectivity to increase knowledge and resources,
iv. Critiquing the promotion of scholarship, and
v. Serendipitous innovation.

Stagg (2017) argued that a radical transition is needed to foster open pedagogy. He presented a conceptual framework for open research based on Bronfenbrenner (Bronfenbrenner 1979), asserting that it is through the understanding of complex influences and contexts of practice that the strategic and operational processes of open education are manifested. The open pedagogy approach focuses on learners and the essential attributes of trust, ownership, peer learning, self-directed learning, and creativity. Hegarty (2015) argued that it is not only difficult but also not meaningful to separate the components of open pedagogy into neat, segregated dimensions. Instead, the components of each of the eight dimensions overlap in many ways. It is impossible to discuss participatory technologies without mentioning innovation, trust, serendipity, sharing, collaboration, connectedness, peer interaction and review, learner contributions, and reflective practice. In addition, open mindsets and open attitudes are emphasized. She argued that because we are all learners in this new culture of

connectedness and transmission, a culture of sharing is essential for open pedagogy. As shown in Figure 2, the open pedagogy model by Hegarty (2015) emphasizes eight attributes:1) participatory technology; 2) people, openness, and trust; 3) innovation and creativity; 4) sharing ideas and resources; 5) connected community; 6) learner-generated learning; 7) reflective practice; and 8) peer review.

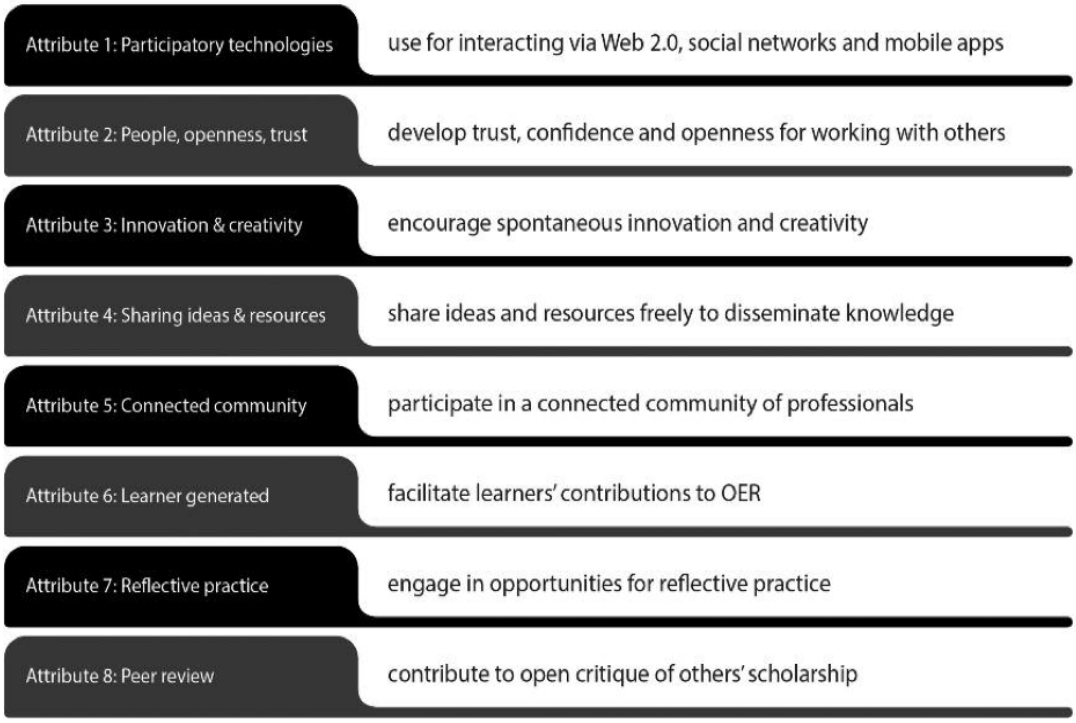

Fig. 2. The eight dimensions of open pedagogy (Hegarty, 2015)

Open pedagogy is not only a matter of pedagogy or the teacher's approach, capacity, and attitudes to learning. It requires systemic change, including the interrelationships and interdependencies among all components. Taylor (2016, p. 2) argued the following:

"[It is] an intentional process designed to alter the status quo by shifting the function or structure of an identified system with purposeful interventions. . . System change aims to bring about lasting change by altering underlying structures and supporting mechanisms which make the system operate in a particular way. These can include policies, routines, relationships, resources, power structures and values".

5. PEDAGOGICAL FRAMEWORKS AS FOUNDATION IN OPEN PEDAGOGY

Open education and merging formal and informal learning in the movement toward open pedagogy will ensure learning for all at any time, by anyone, and through any device. The time has come for teaching innovations, acknowledging innovative learning spaces, and discovering the unknown through "messy" learning that is increasingly unstructured (Global Digital Citizen Foundation, 2017; Watanabe & Churches, 2017) as well as experimental learning (Kolb & Fry, 1974), phenomenon-based learning (Prinski, 2013), challenged-based learning (Nichols & Cator, 2009), and active and authentic learning (Herrington & Herrington, 2006). According to Cormier (2014), the society is the curricula, and learning activities should be based on society and real life.

Challenged-based(Nichols & Cator, 2009), self-determined (Blascke & Hase, 2015; Hase & Kenyon, 2013), and authentic learning (Herrington and Herrington, 2006) are corner-stones, and take place within the framework of open pedagogy.

Characteristics for challenge-based learning is that it addresses problems that are globally significant, such as war or the sustainability of water. Students research the problem by considering the events taking place in the world around them and by strengthening the connection between what they learn in formal education and what they perceive in their environment. Moreover, challenge-based learning is that it appropriates the networking tools and media production techniques that are already used in daily life by many 21st century learners. Regarding networking and learning by and through networks, such as digital social networks, Jahnke (2015) argued that not only interaction but also cross-action learning spaces should be included in the design of teaching and learning in the 21st century. She stated that based on the premise that the digital world is a new form that is comprised of multiple communication spaces and many different layers, human action is not only grounded in interactions but also in multiple cross-actions within and across cross-action spaces. This mode of learning requires other kinds of support and facilitation by the teacher, particularly in the early stages of learning. Such guidance is in the form of scenarios, templates, questions, scaffolding skills, and so on. All these resources are designed to support and guide students as they explore the unknown. These pedagogical approaches are of a cyclical nature; hence, learning becomes a nonlinear process of exploration, discovery, and critical thinking (Global Digital Citizen Foundation, 2017). Using these approaches, learners can take control in orchestrating their own learning, which is led by self-motivation and intrinsic motivation rather than external control (Ossiannilsson, 2017a). These approaches foster authentic and real-world learning, which lead to deep learning. For learners to be successful, there needs to be a shift in ownership, which unstructured learning encourages. Unstructured learning is nonlinear, resembling a tangled string overlapping several times at different angles. In examining something from different angles, perception is strengthened, and each angle reinforces understanding. Self-determined learning, or heutagogy (Blaschke & Hase, 2015, Hase & Kenyon, 2013), is the foundation of authentic learning, which provides important opportunities for students to interact with the wider community and reflect upon their experiences. This approach resembles challenge-based learning and problem-based learning (Johnson et al., 2009. Herrington and Herrington (2006) described authentic learning as a style of learning that encourages students to create a tangible, useful product that can be shared with their world (Hase & Kenyon, 2013; Herrington, & Herrington, 2006; Johnson et al., 2009). Authentic learning demands adaptability, patience, and the willingness to learn and apply what is learned. Most significantly, it requires learners to take full responsibility for what they learn. In authentic learning, problems must have a personal frame of reference, which cannot happen without the student's inclusion in defining the problem and selecting the solution. Choice occurs when students make their own interpretations of literature and art.

Rule (2006) suggested that four components are integral in authentic learning experiences:

- Activities that involve real-world problems and the presentation of findings to audiences beyond the classroom
- The use of open-ended inquiry, thinking skills, and metacognition
- Student engagement in discourse and social learning in a community of learners
- Students' direction of their own learning in project work (i.e., heutagogy or self-determined learning.

The Capetown declaration (2017), Weller (2014), Hegarty (2015), and Inamorato dos Santos et al., (2016) all emphasized that open content as OER, MOOCs are crucial for open pedagogy. Hence, open content, particular OER will be.

described in the next section.

III. *OPEN CONTENT*

Content in the open education framework refers to materials for teaching and learning, and research outputs, which are free of charge and available to all (Inamorato dos Santos et al., 2016, p25). Open content, such as OER and MOOC (Bossu, Bull & Brown, 2015; Daniel, 2012;Gil-Jaurena&Domnguez, 2018); Ossiannilsson, Altinay, & Altinay, 2016b 2017), is well-recognized in ecologies of open education. OER is thus of essential related to open pedagogy. OER are defined by UNESCO (2015a, 2015b, 2015c) as:

"*Open Educational Resources (OER) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt, and re-share them. OER range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video, and animation".*

OER are most often licensed as Creative Commons (CC), which signifies openness. Wiley (2013) argued that open pedagogy comprises a set of teaching and learning practices that is possible only in the context of the free access and the 4R (reuse, revise, remix and redistribute) permissions characteristic of OER. To the 4R, Wiley later added a fifth dimension, free to access (2017) resulting in the following characteristics: Free to access, reuse, revise, remix, and distribute. According to the Commonwealth of Learning (2017), the top five issues in the global acceptance and implementation of OER include the following:

. To emphasize the benefits: the focus should be on advocacy, awareness, and sensitization of the benefits of OER among governments and key stakeholders

To be learner- centered: strengthen capacity building for OER to assist key stakeholders in retaining, reusing, revising, remixing, and redistributing these resources. Focus on the integration of OER in teaching and learning. Keep the learners at the center of OER.

- To move both from the top down and from the bottom up: invest significantly in policy development at both national and institutional levels. A national policy framework will guide activities, and institutional OER policies will help teachers adopt OER quickly, which will facilitate the creation and sharing of OER on a wide scale.
- To bridge the digital divide: a prerequisite of engagement with OER is the access to ICT infrastructure. Although this access is increasing in many regions, further work is required to ensure equitable access.
- To measure and monitor: in countries that have policies and various activities, it may be worthwhile to examine how activities are implemented and how implementation is measured. Monitoring the progress of OER in a systemic manner could help countries establish benchmarks and follow good practice.

The cultivation of a culture of quality is critical, and it must be in the interest of all stakeholders, as indicated above. Moreover, it must be empowered, fostered, and encouraged by leaders (Ossiannilsson, 2017a, 2017b, 2018). In the next section, therefore, open leadership, one of the key dimensions in the open education framework is discussed.

Inamorato dos Santos et al. (2016) emphasized leadership as a transversal dimension because it supports OEP at different levels, such as personal motivation, task organization, collaboration, and outcome management. They emphasized that leadership interacts with, affects, and have impact on the other transversal dimensions, as well on the core dimensions in the open education framework, as shown in Figure 1.Inamorato dos Santos et al., (2016, p 29) argued that:

"Leadership in open education is the promotion of sustainable open education activities and initiatives via

a transparent approach from both the top-down and the bottom-up. It paves the way to creating more openness by inspiring and empowering people".

Moreover:

"Leadership in open education goes beyond the creation of strategies and activities decided at an executive level. It is above all the identification of champions at different levels, both bottom-up and top-down, who will lead open education at the institution in different strands. It is a transversal dimension because it supports open education practices at different levels: personal motivation, task organization, collaboration and outcomes management. Leadership in open education should promote actions that enable the take up of open education across a university by a whole range of stakeholders, including learners".

The Commonwealth of Learning (COL) argued that in the culture of open education, the place of educators and leaders should be examined in the context for rapidly developing global society (Brown, Czerniewicz, Huang, & Mayisela, 2016). Central to this aim is the need for all educators and leaders to partake in lifelong learning and to understand the importance of positive personal and professional values, including effective reflective practices.

Alvesson, Blom, & Sveningson (2017) stated that leadership and management are critical for the success in transformation processes to any organizations, including institutions of higher education.

In the 21st century, leadership, particularly in higher education institutions, must change direction to accommodate changing paradigms and unbundling approaches to opening up education. For leaders and managers to cultivate a culture of openness, it is crucial to facilitate and empower capacity building by all staff and learners. The leaders of today must empower the transformation process by taking advantage of increased digitization, cloud services, and free social media tools to improve the communication and interactions related to innovative learning spaces, including cross-action spaces Today, it is essential to integrate digital tools into the classroom to increase student engagement, facilitate professional learning, and access new opportunities and resources (Jahnke, 2015). Successful integration of technology requires resources such as infrastructure, support, incentives, and continuous professional development and training for all staff and learners, for which leaders and managers must allocate resources and funding (Arnold & Sangra, 2018; Ossiannilsson, 2017a, 2017b, 2018).

Leaders at all levels must pave the way for creating openness by inspiring and empowering their staff and by identifying champions who will lead the institution to develop different strands of open education (D-transform, 2017). Hence, in this context, leadership involves building a working culture that embeds innovation that will foster open approaches to change. Leaders and managers must be involved, engaged, responsible, and empower digital transformation to promote the cultural change to staff, learners, and the organization as they lead change. A key issue for leaders is to promote a culture that will not only allow personnel to grow, take responsibility, and build trust throughout the organization but will also enable a culture of passion and persistence (Ossiannilsson, 2017a, 2017b, 2018).

Not only leadership but also universities offerings, services, business models, strategies, and missions must align to meet the challenges in the 21st century. Rethinking leadership and management at all levels will ensure that processes are resilient, agile, and boundary-less so that learners can take ownership of their learning in an open environment (Arnold & Sangra, 2018).

The empowerment of open pedagogy involves several stakeholders. These are learners, academics, faculties, the institution, the region, the nation, and the globe (Kirkwood & Price, 2016; Ossiannilsson et al., 2015). All have interests and purposes, which can coincide or differ; and all stakeholders have voices with which they

can interact, empower, limit, or even prevent the cultivation of open pedagogy.

The potential of open pedagogy is further complexified by the reality of various levels within organizations that need to be considered – the micro, meso, and macro levels (Kirkwood & Price, 2016; Ossiannilsson et al., 2015; Stagg, 2017). The macro level concerns regional, state, national, and international relationships; the meso level concerns institutions; and the micro level concerns individual users. These categories can also include other interpretations, the macro level can refer to the entire institution, not only its strategy and mission but also its infrastructure, allocation of resources (e.g., costs and time), incentives, and support for students and staff. The meso level can include the department or faculty, and some of the same issues that need to be considered at the macro level. Finally, the micro level can refer to course offerings or modules, such as curricula, course structure and design, assessment, learning outcomes, and method of delivery (Kirkwood & Price, 2016; Ossiannilsson, 2012; Ossiannilsson et al., 2015). At each level, interdependencies and interrelationships influence the individual's practice, assumptions, values, and ability to conceptualize change and development. In an educational setting, all levels of ecologies inform the practitioner's approach to teaching and learning; and they frame his or her responses to enhancing, transforming, or challenging personal practice. In open pedagogy these three levels are important to consider, as it is not just an issue for the single teacher or academic, but the ecologiesare crucial. A culture of openness must begin with the management team, it is crucial that in their daily activities and actions, leaders and senior managers are models, as strategies and visions are not enough, they must be embedded in values, actions, and mindsets in both top-down and bottom-up approaches. Beyond this, a culture of openness must be nurtured. Considering the three levels micro, meso, and macro can identify gaps and limitations between levels and to secure the eco system. This holistic contextual approach is needed to enhance the quality of the digital transformation (Caldwell & mays, 2012; Ossiannilsson et al., 2015).

The implementation of open pedagogy requires an agile and resilient approach as it fosters and empowers the sustainable ownership of the individual's learning in a rapidly changing environment. Open pedagogy must therefore embed, empower, and maintain quality; these issues are thus discussion in the following section.

6. REFORMS THROUGH QUALITY AND HIGHER EDUCATION IN THE ERA OF OPEN EDUCATION

In the United Nations UNESCO SDG4 goals (UNESCO; 2015a, 2015b 2015 c) quality and education for all are emphasized, anytime and anywhere, in a process that is democratic and equitable. Inamorato dos Santos, et al., (2016, p. 28) argued that quality in open education refers to the convergence of the 5 concepts of quality (efficacy, impact, availability, accuracy and excellence) with an institution's open education offer and opportunities. This is articulated as:

- Efficacy: fitness for purpose of the object/concept being assessed.
- Impact: is a measure of the extent to which an object or concept proves effective. It is dependent on the nature of the object/concept itself, the context in which it is applied and the use to which it is put by the user.
- Availability: this is a pre-condition for efficacy and impact to be achieved, and thus also forms part of the element of quality. In this sense, availability includes concepts such as transparency and ease-of-access.
- Accuracy: is a measure of precision and absence of errors, of a particular process or object.
- Excellence: compares the quality of an object or concept to its peers, and to its quality-potential (e.g. the maximum theoretical quality potential it can reach). In higher education, quality is often

measured by norm-based regulations, accreditation, and certification, which in turn are measured on quantitative methods, enrollments, and research. However, in the era of open education, unbundling, lifelong learning, and student centered, self-determined learning in which learners orchestrate their own learning demand a new understanding of quality in higher education. Consequently, the values by which quality is measured must be reconsidered to meet the emerging challenges now and, in the future, (Inamorato dos Santos, et al. 2016; Ossiannilsson et al., 2015) New innovative pedagogical demand new approaches to quality assurance in learning and teaching, educational services, and even business models.

Regarding quality, it is essential to foster a holistic approach to openness and to consider the ecological levels and the ecologies of open pedagogy. Micro, meso, and macro levels have to be considered as well as the 10 dimensions in the framework on open education (Inamorata et al., 2016). It must also be acknowledged that all levels, interconnections, and interstices should be included. In the socially connected world, physical, digital, and cross-action and cross-spaces should even be considered (Jahnke, 2017).

Reconsidering the culture of quality as it applies to open pedagogy (Hegarty, 2015; Wiley, 2013), situated learning, and the move toward self-directed learning (Hase & Kenyon, 2013) requires the rethinking of quality assurance, as well as quality enhancement. Several recognized international quality models of open online education use a holistic approach to emphasize the importance of focusing on not only learning and teaching processes but also policy, strategies, curriculum, course design, course delivery, infrastructure, and support for staff and students (Ossiannilsson et al., 2015). Quality dimensions also relate not only to the efficiency, satisfaction, and engagement of learners and faculty members but also to the short- and long-term effects on individuals and society. In the 21st century, when learners take control of their own learning, and the contexts of formal and informal learning are merged, and blurred quality related issues have to be reconsidered (Ossiannilsson, 2018). The degree of quality of open education offers/opportunities can be measured by different actors, such as the institution itself, its learners or the State,(cf. the discussion on stakeholders and micro, meso, and macro levels as above). According to Contact North (2017), 10 key developments will drive the new thinking about quality and quality assurance:

- The development of learning analytics
- The use of student engagement as a basis for benchmarking and evaluation
- New forms of flexible learning which focus on outcomes and processes
- New forms of assessment
- The focus on skills and competencies
- New kinds of credit and skills recognition
- New providers for learning with new institutional models and processes
- The internationalization of learning
- A renewed focus on outcomes and impact
- A changed expectation about qualifications and outcomes from employers

7. CONCLUSIONS AND RECOMMENDATIONS

This article has elaborated ecologies of open pedagogy, and some related dimensions, as open content, leadership and quality. The rising global challenges provoke universities in the present context. One of their main justification is to equip people for the age of uncertainty and to help tackle the major global challenges of this century. Universities are therefore raising the questions of how to educate people when no one knows which professions will exist in the near future or what skills will be sought, especially when knowledge is increasingly emerging and developing outside the academic realm. Young people need to be prepared to become thoughtful global

citizens who can find creative and ethical solutions to the new and interconnected challenges of the 21st century, but also economically viable contributors. Throughout this article it has been argued that open education and ecologies of open pedagogy will empower and allow learners to take the lead in orchestrating their own learning.

All stakeholders have responsibilities to advocate ecologies of openness, as they can either empower, limit, or inhibit the cultivation of open pedagogy. They are also interconnected and mutually reliant, such as in relation to funding, financing, laws, reforms, strategies, regulations, resources, and professional development. Moreover, proficiency progresses through innovation, leadership, exploration, integration, and awareness. Hence, the holistic contextual approach is both crucial and essential.

As learning and teaching take new directions toward personal learning and learner-centered approaches, existing evaluation and assessment methods no longer will be applicable. Accordingly, evaluations and assessments will be transformed from focusing on content and facts to focusing on 21st century metacognition, skills, attitudes, and values. There is no value in using old methods to measure new ways of learning, skills, attitudes, values, and knowledge. We can no longer educate people for a future that we cannot predict. Instead, we must prepare them for the uncertain contingencies of the 21st century.

In the transformation, and reforms to open pedagogy, particularly with regard to the eight attributes described by Hegarty (2015), learners control their own learning and education is agile in meeting the demands, assessments, and evaluations of learners and their societies. Alleight of Hegarty's attributes discussed in this article are vital in creating ecologies of open education. However, two further attributes are necessary to empower open ecologies: open research and open scholarship In order to achieve the transformation to open education and meet the global challenges in the 21st century, the following actions are recommended:

- Apply a holistic systemic approach.
- Include all micro, meso, and macro levels in identifying intersections and interstices.
- Empower ecologies of open pedagogy.
- Cultivate a culture of openness in individuals, communities, and society.
- Apply open leadership.
- Reconsider the meaning of quality in higher education in the era of open education.
- Ensure the involvement and ownership of gatekeepers in ecologies of openness.
- Reconsider evaluation and assessment.

The culture of openness, and ecologies of open pedagogy is not an end in itself, but an ongoing process.

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