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## A Circular Pedagogy for Higher Education

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### Abstract

Over the last two decades, higher education has been subject to significant scrutiny due to increasing pressures to provide a meaningful and relevant learning experience to the student population, and by their strong connection to the functioning of the economic and political systems. By reflecting on the controversies surrounding pedagogy, this paper contributes to the current debate by exploring pedagogy as a circular process where learners grow and develop by taking different roles and identities as they navigate a research-informed learning continuum defined by growing levels of complexity and uncertainty. This study introduces a new pedagogical paradigm for adult education, inspired by the Humboldtian model for higher education and that we have coined as *"circular pedagogy"* where the role of the teacher, student and researcher are indissoluble.

**Keywords:** Pedagogy, Circular Pedagogy, Humboldt, Higher Education, Teacher, Student, Researcher

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## 1  Introduction

Significant levels of complexity define the nature of Higher Education Institutions (HEIs) as they are immersed in a multifaceted world to which they are contributing to add further layers of convolutedness. The reality of higher education has been studied in the context of complexity by Barnett (2010, 2000, 1990), where the author offered insights on the need to acknowledge that universities are functioning in an age of supercomplexity. The transition towards mass higher education systems in parallel with institutions' limited access to public funds and continuous innovations and technological advancements have been driven by two contending patterns of change: i) the increased diversity in the components of the curricula, and ii) the need to respond to the interests of employers by promoting employability skills. Over the years, we have witnessed significant pressures in adult education emerging from the diversity of the curricula and compounded by pressures for greater responsiveness towards the world of work that is materialising in a universal shift towards performativity. Everchanging dynamics in adult education have led to a situation where *"demonstrable skills"* (i.e., skills that show what the worker can do) are perceived as being more valuable than knowledge (Cheng et al., 2022; Blue, 2021; McCowan, 2015; Gabric and McFadden, 2011; O'Leary and Oakley, 2008; Dyson and Keating, 2005;). As a result, adult education learning environments are failing to respond to the student population's needs, the changing landscape of working ecosystems, and their stakeholders' demands and expectations as they seem to be drifting towards an educational model that is vocation-driven (Cheng et al., 2022). We add to the complex dynamics the interchangeable role of teaching, learning and research activities which intertwined dynamics need to be reflected upon in an ever-changing educational context. The complexities of the world's higher education institutions are parallel to the increasing diversity of the student population and a complex socio-economic, political, and environmental reality. Universities are characterised by a combination of *"traditional students"* and growing rates of more mature and diverse students defined by their cultural values, religion, ethnicity, race, socio-economic status, and sexual orientation. The diversity of our student population and the evolving nature of our socio-economic and environmental context, highlights the necessity for new pedagogical approaches. Adult education should be supported by broad knowledge content informed by a deep reflection of our society's changing realities and needs that should not be limited to the demands and requests of the labour market or the changing priorities of the economic and political system. The educational environment requires integrating wide-ranging content and broad-minded skills that acknowledge students' needs that correspond to a more humanistic and holistic approach to education that promotes and encourages personal and professional development. In addition, the purpose of the learning experience requires alignment with the *"real world problems"* encompassed by a well-defined curricular agenda and supported by high-quality and meaningful assessment and feedback processes. The ultimate goal is to facilitate self-regulatory and self-directed learning practices where students are accountable, take ownership of their learning, and are responsible for monitoring their advancement and development (Evans et al., 2015, p.6; Evans et al., 2010). In this research paper, we argue that the academic community's general understanding of pedagogy is quite limited and frequently referred only to teaching and reduced to the role played by teachers in the educational context. Besides, pedagogy is often linked to teaching children, which poses significant challenges to innovating and improving higher education settings. Furthermore, there seems to be a general lack of consensus regarding the meaning of pedagogy across countries, disciplines, and points in time, which exacerbates the confusion around the term.

Knowles (1995) argued on the need to differentiate between adult and children's education, and he proposed the term andragogy (Andr mean *"man"),* which he considered a more suitable, practical, and relevant term when referring to the art and science of helping adults to learn. But is it really necessary to move away from the term pedagogy as we refer to adult education? Our research explores to which extent pedagogy has been overlooked as part of HEIs learning and teaching models and the damaging implications as we continue and insist on separating the learner from teaching and research practices. We start our discussion by exploring the concept of pedagogy in the higher education landscape. We continue developing our theoretical framework, introducing the novel concept of circular pedagogy, and elaborating on elements critical to understanding a more competent, imaginative and creative adult education model that we envision as smart education for sustainable development. The discussion progresses with insights on how we can connect the concept of circular pedagogy to universities and the importance of acknowledging the connection between the student, the teacher, and the researcher. Furthermore, we examine the importance of transdisciplinary education as part of the learning continuum and its significance for the lifelong learning process. The discussions develop a link between the Humboldtian model for higher education and our proposal for a circular pedagogy as we visualise an evolving learning continuum defined by high levels of complexity that lead to the conclusion of the paper.

## 2  Exploring Pedagogy – The Higher Education Landscape

Pedagogy emerges as a very contested term that historically has led to significant disagreements and, in some instances, to severe criticisms grounded on the predisposition of the discipline to engage with a wide array of theories, methodologies, and discourses frequently used in endeavours seeking to marginalise the discipline. Additional controversies arise due to a perceived lack of rigour associated with its conceptual and methodological framework and its lack of alignment with practices in the so-called *"hard sciences."* In some spheres, pedagogy is subject to severe criticism and is conceived as a poor-ill term that has been traditionally neglected and misunderstood (Watkins and Mortimore, 1999; Levine, 1992; Simon, 1981). As an example, we can consider how pedagogy is viewed as the discipline of study related to education and teaching methods frequently used to refer only to teaching and, in some instances, confined mainly to the domain of primary education (Shah and Campus, 2021). On the other hand, most educationists regard pedagogy as an academic discipline focused on education and teaching methods that bring a broader dimension to the field. We wonder why pedagogy does not seem to be able to articulate a holistic understanding of education or communicate its paramount importance in the design of learning models. As such, it has an influence across the educational sector, including tertiary education. In addition, the development of curricula, feedback and assessment processes, and the interaction of teaching, learning and research practices fail to acknowledge the idiosyncrasies of different disciplines. The idea that "*one-size-fits-all*" remains blurred, and it is a significant area of concern that more than justifies the introduction of new pedagogical insights. Adult learning environments need to be supported by various and diverse approaches and not be relegated to just a few due to their noteworthy levels of complexity. Furthermore, some researchers argue that pedagogy is the discipline of study related to education and teaching methods only. As such, we have identified a research gap that needs to be addressed as we propose a new pedagogy that we have coined as a circular pedagogy for higher education that integrates the teachers, the students, and the researchers in the complex and everchanging learning continuum.

The importance of defining research-informed educational models through a circular pedagogical dimension and its practical implications is missing from the literature. Furthermore, the marginalised nature of pedagogy was very well communicated by Levine (1992),

> *"In this society, we certainly did not, still do not, grant the study of teaching [pedagogy] either the standing of a science or the practice of an art form. Indeed historically, we have defined the study and practice of teaching narrowly and even if unconsciously, we have arranged things so that the profession and its practitioners have every possible kind of low status conferred upon them" (p.197).*

Over the years, pedagogy has grown to become an academic discipline with broad meaning and a more comprehensive reach. But, still, its historical neglect has resulted in higher education institutions (HEIs) that have not managed to place it as a core element of their vision and practices. Pedagogy as an academic discipline has an overall sense, defined by important disagreements among educators and researchers that question if pedagogy should be viewed as a science or art. By reflecting on the controversies surrounding pedagogy, this paper contributes to the current debate by exploring pedagogy as a circular process where learners grow and develop by taking different roles and identities as they navigate the learning continuum. Over the last two decades, higher education has been subject to significant scrutiny due to increasing pressures to provide a meaningful and relevant learning experience to the student population. Growing levels of criticism emerge from different fronts that include issues related to i) quality of educational provision, ii) the development of employability skills with practical and work-readiness features, iii) the educational offer and its link to *"learning gains",* iv) or its limited response to integrate the student voice as part of the learning process and its ecosystem (Morley and Jamil, 2021). Worryingly, the landscape of adult education seems to be guided by significant levels of underfunding and political pressures to become financially self-sufficient inevitably forcing the unstoppable progression and shift towards a model that aligns with employers' demands and needs for college graduates who are well-prepared to enter the labour market. Furthermore, educational models are embracing the nature and demands of the market by engaging in the commodification of their courses that support the precepts of the consumerism culture. Along the commodification process of higher education, we seem to be forgetting the importance of education to develop, nurture and foster a broader range of skills that are significant to contribute to students' development as global citizens and not limited to the idea of *"work-ready machines."* We argue that adult education should not be limited to equipping learners to become work-ready only. By limiting our understanding of higher education as a place to provide work-readiness or job readiness skills, we continue our journey towards a biased adult education model that can exacerbate the ongoing damage to HEIs and our global society. Undoubtedly, work and job readiness are critical elements of the learning process, and they require attention and cannot be neglected. Our societies are developing and evolving rapidly, and job-related skills should be an integral element of adult education, but without abandoning or overlooking other aspects. The educational sector is facing considerable challenges and pressures as it needs to provide learning environments that enable learners to become adaptable, flexible, resilient and environmentally conscious. There is an imperative need to reskill and upskill with the support of technology and innovation as the industry evolves and the socio-economic environment changes. Therefore, existing educational models are undoubtedly insufficient to equip current and future generations to face contemporary and future socio-economic, political, and environmental challenges.

Furthermore, the historical separation between higher education curricula, the lack of dialogue with employment sectors, and the disconnection with students' career demands and

socio-economic expectations have contributed to exacerbating the educational failure. The provision of adult education seems to be limited by the need to offer programmes that stay relevant and attuned to the speedy changes in the labour market and the continuous demand for new skill sets demanded by employers (Finch et al., 2018; Miles, 2017; and Trilling and Fadel, 2009). However, our ability to understand learners' roles from a more complex and holistic dimension that is not circumscribed by the need to secure a well-paid job is critical to ensuring that educational models do not fail. We are walking towards an educational sector increasingly detached from our social realities and more attune with commercial and market needs. We are witnessing a worrying trend regarding HEIs focused on consolidating a transition towards an education model that only satisfies the needs of the labour market guided by businesses and economic interests that are not in alignment with educational goals for smart sustainable development. We are facing a paramount challenge, as the role of education is losing its holistic dimension as its favours economic interests that are reflected in the need to ensure an appropriate supply of a ready workforce that meets the needs of the industry. The introduction of employability and performativity metrics within higher education is providing a worrying connection between a vision of education that is closely linked to economic and financial models that are ubiquitously affecting how adult education is shaped. According to Woodside (2018), traditional learning and teaching practices do not appropriately prepare students to face the challenges of an interconnected global society and be job-ready graduates that respond quickly to their employers' requirements. The curriculums are disconnected from our current reality and anchored on developing academic skills–that are significantly restricted by the academic context and lately dictated by industry needs, which are not always appropriate or up to date and that do not integrate the student's voice. Therefore, we argue on the existence of a significant misalignment between the students and growing sustainability challenges that are now compounded by the labour market demands, evolving social needs and the reality of climate change. There is a lack of adult education seeking to provide learning spaces that are flexible, adaptable, and ready to foster learning for action and impact where students develop and grow to play their role as global citizens, to become actors of change that advocate for inclusive growth and development and that are not confined and limited to the labour market needs and their commercial objectives.

### 3   A New Pedagogy for Higher Education

Contrasting and challenging areas start to emerge as we reflect on to which extent higher education curricula should surrender to the needs of the industry and economic agendas. We argue for the urgent need to identify an educational framework that is flexible, adaptive and that provides an appropriate balance between the necessity to develop academic skills, employability skills, and the importance of following practices that are rigorous and in compliance with ethical standards and in concurrence to our global society needs. Within the outlined context, work-related skills and additional capabilities founded on practical experiences can help enrich and provide an adequate balance to the teaching, learning and research portfolio. Students need to develop the required skills to create real-life connections, competencies and skills that are not only limited to the future profession and work requirements.

The European Commission, in its Education and Training Monitor 2014 report, calls for enhancing graduate employability skills that can benefit society and the labour market (European Commission, 2014). There is indeed a need to enhance employability skills, but we should avoid understanding the development of employability skills as the only and primary

aspect of the adult educational offer. According to Tomlinson (2017), graduate employability is a defining factor of economic systems as it is a critical part of the development of human capital and, as such, emerges as a vital element to be considered in contemporary economic and educational policies (Tomlinson, 2017). There is no doubt that education needs to respond to the labour market needs, but we argue that the role of HEIs should not be limited to employability aspects only. Therefore, we need to engage in a better understanding of the purpose of adult education and the significance of pedagogy.

### 2.1 Understanding Pedagogy

The term pedagogy has been subject to considerable criticism as it has experienced a complex process of finding its way around as a respected academic discipline, resulting in a long process defined by substantial change, adjustment, and neglection and marginalisation. Best (1988) offered insights on the metamorphosis of the term pedagogy when the term didactics emerged in Germany and was later adopted in France, with different views and angles considered across different countries where in general pedagogy did not seem to find its space. The continuous criticisms and rejection of pedagogy as an academic discipline occurs from its confinement to children's education and complexities surrounding various attempts to find its home on the premises of adult education. In addition, the reviewed literature reveals inadequate views and opinions surrounding the word pedagogy and misconceptions that lead to a very restrictive vision of connecting pedagogy only with the teacher, leaving out the student and the researcher as part of the learning continuum where its personal dimension does not integrate or acknowledge the individual learning process and its holistic and humanistic dimension. Zukas and Malcom (2002) focus on unveiling pedagogic identities or versions of the educator in higher education. The authors identified five pedagogic identities: i) the educator as a critical practitioner, ii) the educator as psycho-diagnostician and facilitator of learning, iii) the educator as a reflective practitioner, iv) the educator as situated learning within a community of practice, and v) the educator as assurer or organisational quality and efficiency; deliverer of service to agreed or imposed standards. Quite remarkable, each identified pedagogic identity does not consider the interrelated nature of the teaching, learning and research processes, and their overarching impact on students' development. Moreover, the existing body of knowledge suggests three major pedagogical approaches: i) the traditional teacher-centred, ii) the progressive student-centred, and iii) the critical pedagogy. After a careful analysis of the different and dominant pedagogical approaches, it emerges that they keep separating the learner's different identities and their interchangeable nature. In addition, a significant barrier between the teacher and the student emerges due to conflicting views regarding the role to be played by teachers and students. We seem to misunderstand and undermine the importance of the teacher-centred approach and its significance as we transition towards spaces that facilitate a progressive transition toward student-centred environments that enable and foster knowledge sharing, critical thinking, and the integration of research activities.

There is an apparent detachment and misalignment between higher education pedagogy that continues to be disconnected from the learners' reality. By insisting on differentiating and separating different learning stages, processes, and roles/identities, we are contributing to enhancing the divide between teaching, learning and research activities within higher education institutions. Undoubtedly, disruptions need to be introduced to bring awareness of the interchangeable nature of different learning phases and how they are articulated and interconnected. Moreover, the complexities that define the learning ecosystem must also be
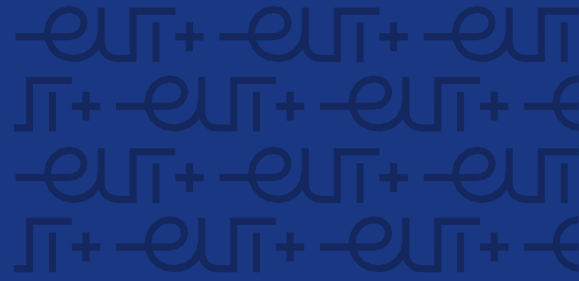
acknowledged. We argue that learning should develop through an organic and dynamic environment that seeks to narrow down the well-known theory-to-practice gap and, in particular, the ability of students to drive processes of change, which we designate as *"circular pedagogy"*. According to Morley and Jamil (2021, p. 5), *"The challenge is to move real-world learning into a robust, research-informed position so its implementation does not occur by accident, but it is considered against the more traditional taxonomies of learning and established pedagogic theory."* Furthermore, Barnett (2000, p.164) reflects on the connection between professional life and the need to manage growing levels of complexity due to the overwhelming growth of data, fast pace of innovation and technological developments and the diverse range of theories in parallel to juggling multiple frames of reference that he refers to as supercomplexity. We connect *"circular pedagogy"* to Morley and Jamil (2021) research-informed position and to Barnett (2000) concept of supercomplexity as we take a closer view of the reality of HEIs.

According to Barnett (2000), the notion of supercomplexity helps to explain situations where we are faced with conflicting frameworks that need to be accounted for as we try to understand a situation. He elaborates further and provides insights that question the university pedagogical tasks and to which extent they should be restricted to the transmission of knowledge. Universities should move beyond the knowledge transfer domain by supporting the development of skills, capabilities and attributes that enable students to manage the conditions of supercomplexity. Consequently, higher education must embrace three dimensions of being, i) knowledge, ii) self-identity, and iii) action in pedagogies to be formulated and embedded as part of the learning ecosystem where new ways of teaching that are informed by leading-edge research are needed. HEIs cannot afford to keep separating teaching and learning processes from work done by their research experts. Mechanisms that link every element of the university life, work and experiences need to be articulated. In addition, to providing learning spaces where students can develop their voice at the time that they interact in transdisciplinary educational spaces that broaden, enrich, and challenge their learning experience. In its deep analysis of adult education practices, Barnett provides a significant critique of the challenges faced by students and their ability to grow and develop. The author points out to lecturers' ideas and practices and, in some cases ill-informed learning processes guided by their preconceptions and perceptions of students. In particular, the pervasive idea that confines students into a subservient position is quite detrimental as it prevents their growth and development and their ability to engage in critical conversations with their teachers. Teachers who see students as mere recipients of a curriculum and do not provide an environment that facilitates engagement, discussion, debate, research activity, critical thinking, and freedom to question and challenge existing knowledge contribute to inhibit student development (Barnett, 2000, p. 163). In contrast, the humanistic educational paradigm provides a framework where students can take control of their learning by bringing forward the role of the student and helping them to become self-directed. The paradigm assumes that adult learners are internally motivated in alignment with the principles that define andragogy (Knowles, 1984).

Here, we argue that to achieve a self-directed and student-centred learning process, the role of the teacher will be critical, as students will need to be guided, coached, mentored, and supported through the initial stages so that circular pedagogy can become the guiding paradigm. In the contemporary version of higher education, pedagogy is cemented in the division between disciplinary and pedagogic communities and the separation between research-based and pedagogic communities of practice (Zukas and Malcolm, 2002, p. 9). An

important constraint is how teaching is separated from research activity, which is a serious limitation to students learning , as there is a limited exposure to vital advancements in the subject matter and areas that relate to *"real problems".* Thus, teaching is seen as a separate activity from research that negatively impacts the learning experience. We go a step further and argue that existing educational models that seek to separate teaching, learning and research elements have a damaging effect on students, and they do not account for the challenges associated with supercomplexity (Barnett, 1990). There is a concerning misalignment between the development of knowledge transfer skills that are needed to navigate our society's contemporary challenges and their evolving nature. Furthermore, with the very diverse student population, there is a need *for "differing strategies necessary to enable diverse adults to learn different things in different settings in different ways"* (Hanson, 1995, p. 105). Therefore, the idea of one overarching and dominant theory or pedagogy that will provide an appropriate framework for adult education is misleading. A single theory would not be able to accommodate the needs and complexities associated with different disciplines and areas of knowledge. The complexities connected with the reality of higher education are indisputable, leading to the need to offer a wide range of alternatives to teachers and students/learners to enable them to take a self-directed and responsible approach to their learning.

## 4   Framing Circular Pedagogy within Higher Education

Adult learning education requires flexibility and adaptability and cannot be straight-jacketed into a limited curriculum (Illeris, 1990). There is a significant conflict in the way that students learn, and the idea of simplified educational models and modalities of teaching is the response to complex learning environments is misleading. How students are taught, mentored, and coached frequently leads to flawed approaches as students are insufficiently prepared to engage with an ever-changing socio-economic environment and emerging sustainability challenges. We argue that a broader foundation is needed as adult education requires dynamic and transformative curriculums that combine innovative and creative features enriched by elements outside the specific discipline to provide a richer context to the learner that synchronises to challenging *"real work dynamics."* Tiffin and Rajasingham (2003) point to a meta-study that was carried out by Griffith University, Australia, examining what constitutes good teaching in a university. The report provided interesting insights based on the studies examining the UK, USA and Canada cases. The findings suggested that teaching cannot be limited to a single evaluation system. A critical argument is that *"there is no right way to be a good teacher"* (Tiffin and Rajasingham, 2003, p. 59). The authors also raise significant concerns regarding a *"new breed"* of university administration rooted in practices that are part of business culture and that are not appropriate to the work that involves adult education. At the centre of the new administrative model, there is an obsessive determination to standardise teaching processes that should be observed and understood by the student that has now become a university customer. The transition towards a commercial nature of adult education justifies growing calls for higher education to become a source of work-ready individuals and the need for a commodification process of higher education courses and programmes that add cost-efficiencies and simplicity to educational models. Furthermore, the idea of simplifying processes, offering curriculums that are more aligned to fast-food menus to enable a picking and mixing approach that satisfies the student-customers, and that does not provide a critical connection between disciplines that contribute to the development of transdisciplinary education, and the neglection of the circularity of the learning process and

pedagogy add further challenges and damage to how we are conceptualising and articulating higher education models.

According to Bengtsen (2017), the introduction of the concept of supercomplexity offers important insights into the transitioning process from a social perspective of higher education towards the development of the subfield of philosophy in higher education. As researchers are referring to the adult education landscape as being affected by complexities, it seems to be a contradiction that the solution can be found in educational models that are simplified by limiting their scope to the market needs. Through his work, Barnett (1990, 1994, 1997) raises concerns regarding the notion, status and purpose of universities and higher education. In alignment with raising concerns regarding the direction of adult learners' education, the transition to understanding universities as a type of sophisticated business is also worrying. Students are now understood as consumers and knowledge workers, which helps to explain the extent of the instrumentalisation of adult education. The term supercomplexity is very diverse and integrates conflicting ideas about HE systems. In addition, the idea of learning models that are focused on the knowledge economy, deep-rooted on disciplinary knowledge creation and student-centred pedagogies, that are all realisable simultaneously adds further challenges as we try to understand the justification behind commodification and simplification of educational models. On the other hand, and bringing a more positive view, it is important to acknowledge how growing levels of uncertainty, unpredictability, changeability, and contestability contribute to making universities highly complex systems and working environments that are an ideal place to nurture, foster and drive transformation (Bengtsen, 2017, p.69). Following Barnett's (1990) idea on a pedagogy for supercomplexity that bring new dynamics to adult education by disturbing students and teachers alike and seeking to remove them from their comfort zone opens the door to creativity, innovation, and transformation in adult education dynamics. Learning spaces should aim to nurture creativity, and curiosity and encourage students to interact, guided by a transdisciplinary learning context. Students should be exposed to the reality of our interconnected world, to the challenges of multilingual and multicultural working environments through learning spaces where students take ownership of their learning and develop their voice, sense of themselves and their own being.

## 5  Circular Pedagogy and Transdisciplinarity

Higher education must engage in a very different way of teaching, learning, and conducting research activities. Our socio-economic and environmental challenges, and the increasing need for economic models that are sustainable and inclusive, call for creating different and innovative learning spaces that facilitate the development and exchange of ideas. Students should be able to formulate their insights, challenge the status quo and engage in a critical dialogue supported by critical and practical arguments where students feel that their views and opinions also matter. And more importantly, students should be encouraged to drive change and think of innovative ways to work together to identify multiple angles and solutions to problems, leading towards education that aligns with the transdisciplinary paradigm.

> *"The challenge of a pedagogy for supercomplexity, accordingly, is to place students in situations in which they are required to handle conflicting ideas and perspectives and uncertain situations [...]. There must be no escape. Challenges that yield alternative legitimate responses must be obligatory. The responses, too, should be personal and interpersonal for that is the character both of academic life amid supercomplexity and of the wider world: both call up the personal and interpersonal"* (Barnett, 2000a, p. 160).

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### 5.1 Student Engagement in Learning

Quite remarkable, most of the literature seems to be concerned about students' perceptions of learning, with an absence of research examining students' ability to transfer ideas, share knowledge and interconnect disciplines. Moreover, the importance of knowledge creation/co-creation, knowledge sharing, knowledge transfer and the relevance of promoting transversal and multidimensional and multifaceted skills have not received sufficient attention. Our understanding of the learning continuum supported by a circular pedagogy connects to Boud's (2000, 2010) views regarding the need to develop skills that must move beyond the immediate confines of a programme or particular discipline. Students need to be supported by the notion of sustainable learning and assessment, where students should be encouraged to apply their knowledge within a transdisciplinary context. The literature highlights the lack of longitudinal research designs that are currently limited to the analysis of the longer-term impact of interventions on students learning and that do not move beyond a module or programme of study.

Research studies focused on the analysis of pedagogy within higher education are vast and characterised by highly variable quality levels. The literature is led by US higher education affiliated researchers, where arts and humanities and health and social care emerge as significantly underrepresented disciplines. Furthermore, there is a significant absence of research focused on postgraduate students, with most available literature emphasising undergraduate learning and teaching provision (Evans et al., 2015). The high-impact strategies to enhance student achievement by analysing student engagement in learning have been subject to study by different researchers. Most of the studies have been framed around a broad range of constructs to offer an in-depth analysis of the wide-ranging definition of pedagogy and engagement in academic learning. Eight core elements have been considered when exploring students' engagement.

a) Student involvement, level of academic challenge, the extent of active/collaborative learning, and student-faculty interactions (Gibbs, 2010; Kuh, 2008)
b) Cognitive, metacognitive, self-regulatory, behavioural, and affective dimensions (Chapman, 2003)
c) Resilience (Wimpenny et al., 2011)
d) Student-directed (Smith, 2014)
e) Students as change partners (Healey et al., 2014)
f) Learning transfer (Evans 2015a)
g) Sustainability (Boud, 2010)
h) Self-regulation (Evans, 2015a, c)

We propose a circular pedagogy that helps us reflect on the need to disrupt and rethink the dynamics between the learner, the teacher, and the researcher, and how their positions are interchangeable along the learning process as there is a clear vacuum on the extant literature on this area study. We argue that the learning continuum should not separate between educational roles as we become aware of their interchangeable nature and work towards ways of promoting education for smart sustainable development that is sustained by transdisciplinarity as outlined in figure 1 and 2 below.
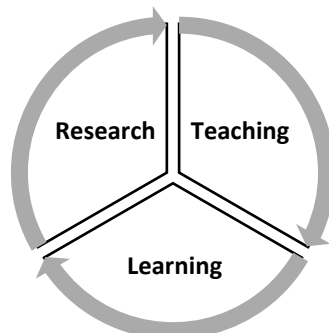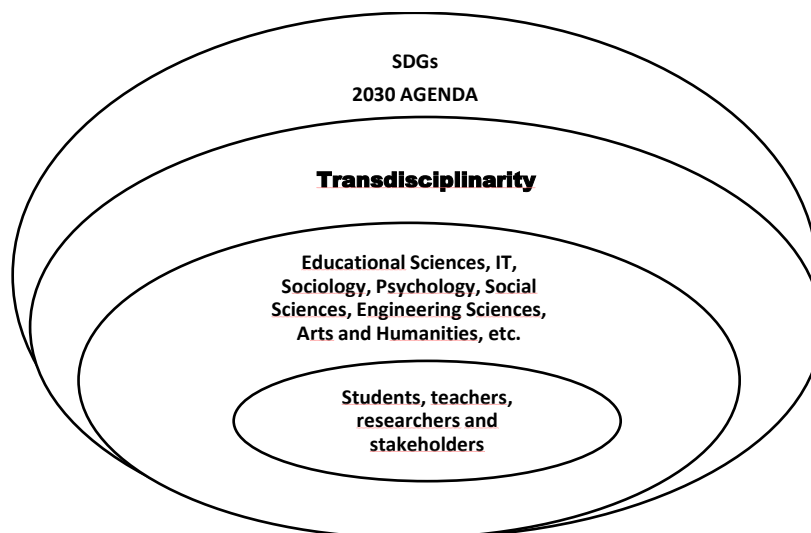
Figure 01: Learning Continuum



Figure 02: Transdisciplinary Education for Smart Sustainable Development



*5.2 From Multidisciplinarity and Interdisciplinarity to Transdisciplinarity*

Transdisciplinarity is a concept as fascinating as it is contested, with numerous interpretations of its meaning and significance depending on the reader's field of interest. Although it represents a relatively new concept, being introduced in the specialized literature relatively recently, as a possible answer to complex problems of the contemporary world, it enjoys increased attention that have materialized in a considerable volume of publications with applications in different fields of activity. Although the idea of transdisciplinarity took shape through the work of Piaget and Lupascu, the term was introduced by Basarab Nicolescu as a natural consequence of the exchange of ideas between different fields. To understand the challenges associated with transdisciplinary education, it is important that we become familiar with the basic elements of the different learning approaches. For example, multidisciplinarity aims to study an object from a certain discipline through several disciplines at the same time. On the other hand, interdisciplinarity implies the transfer of methodologies from one discipline to another. While transdisciplinarity involves learning that takes place at the same time, between disciplines, within disciplines, and beyond any discipline. From certain points of view,

this vision can be seen as an absurdity, for example in the classical system of thought, in which the only perceived reality is the one-dimensional one, while in the transdisciplinary vision a multidimensional reality is addressed, the difference between the classical approaches, pluri and inter, being highlighted by the finality of transdisciplinarity - *the understanding of the present world* (Nicolescu, 2007). According to Nicolescu (2007), transdisciplinarity is based on disciplinary research whose methodology targets one and the same level of reality, being complementary because it is focused on capturing the *dynamics caused by the simultaneous action of several levels of reality*. In this vision, the transdisciplinary research methodology is built on three ideological pillars: i) levels of reality; ii) third-party logic included and; iii) complexity. In this logic, it must be specified once again that disciplinarity, multidisciplinarity, interdisciplinarity, and transdisciplinarity represent *four arrows of the same bow: the bow of knowledge.*

This arc of knowledge in the approach proposed by Nicolescu, aiming to bring forward the open unity of the object and the transdisciplinary subject, through the coherent orientation of the flow of information that crosses levels of reality and flows of consciousness that crosses levels of perception. According to the author, this orientation gives new meaning to the human being in the world, replacing bipedal verticality (the law of universal gravitation) with a conscious and cosmic verticality resulting from the summation and perception of the complexity of different levels of reality. The integration of the knowledge of different levels of reality and the knowledge of different levels of perceptions generates a multiple and complex understanding of the world around us, man being the bridge between knowledge and understanding, continuously giving rise to individual and social evolution in a seemingly endless cycle. So, this new verticality represents the foundation of any viable social project, education being put in the foreground, and that it is highlighted through the report developed by the International Commission on Education for the XXI Century, under UNESCO, chaired by Jacques Delors (1996). In this report, the four pillars of education are highlighted as the foundation of a change of perspective on what a new education entails: *learning to know, learning to do, learning to live with others, and learning to exist.* A careful reading of the specialized literature highlights the fact that all four reference pillars of the current education systems are transdisciplinary by nature. In this framework, an authentic education must emphasize contextualization, concretization, and globalization, where transdisciplinary education reevaluates the role of intuition, imagination, sensitivity, and the body in the transmission of knowledge throughout life, proposing concepts such as transcultural, trans-religion, trans-economy, trans-politics, trans-national. All these concepts are approached through the prism of rigor, openness, and tolerance. In this context, rigor is understood as arguments based on living, inner and outer knowledge, openness the acceptance of the unknown, the unexpected, and the unpredictable is promoted, and tolerance results from the finding of the existence of ideas and truths contrary to the fundamental principles of transdisciplinarity.

These elements represent the skeleton of new education, an education in which all four pillars are equally important, the ruin of one leading to the fall of the others, alike. As a result, a viable and sustainable education is based on an integrated education of man, not just of the mind at the expense of the sensibility and the body, as was necessary at a certain period of human evolution that generated the explosion of knowledge we enjoy today. At the present time, in order to be able to manage the large volume of information accumulated by humanity, but also the new global challenges to which we are all vulnerable, it is impetuously necessary for the new model of education to create the necessary conditions for the development of a complex, open and gentle thinking, primarily concerned with the human being as a planetary and cosmic entity alike.

Figure 03 below provides a new vision for educational models that revolves around our vision for adult education sustained by Technological Education for Smart Development,

Sustainability and Transdisciplinarity (TESST), which offers interchangeable positions to the students, teachers and researchers throughout the learning process for entering into a cycle of interactions with institutions where everyone participates in change and innovation along with the advantage of knowledge-sharing and networking possibilities with experts and innovators. This cycle is created inside the circular pedagogy in which, through learning, teaching and research, the students will be supported, nurtured and coached to grow by equipping them with the necessary skills for applying theories and using transdisciplinary knowledge to engage with real-life problems.

Over time, HEIs have changed their roles and operate in a continuous adaptation to different societal contexts, not without resistance and conflicts. To face the new challenges, the university is transforming itself into a space of thought, reflection, and action, open to the public and cooperating with government bodies, academic entities, public entities, private entities, NGOs, pre-university schools, community groups, local private entities and as such, they are becoming less isolated or confined to an educational silo. We call for adult educational models that should aim for direct, intrinsic, long-term links with these entities both for the practical needs of the students and for gaining value from the circularity of productivity in research with support from our proposed circular pedagogy.

Figure 03: Circular Pedagogy for Technological Education for Smart Development, Sustainability and Transdisciplinarity (TESST)
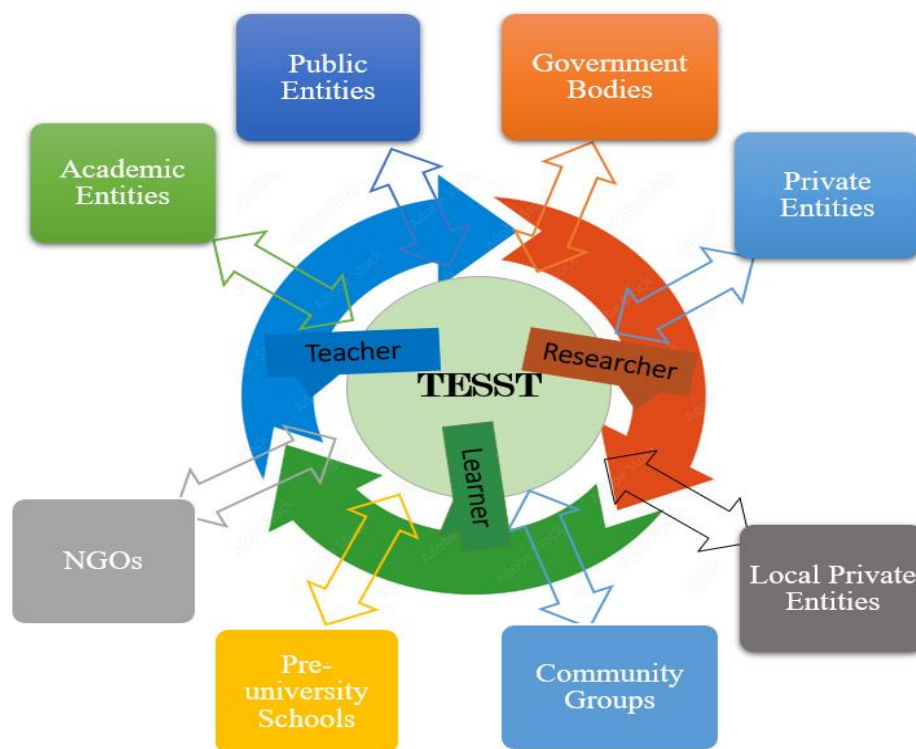


Source: The authors (2022)

Our circular pedagogy reflects on the need to respond to our contemporary society challenges that is demanding new ways of learning, new paradigms to manage the knowledge generation process and the transfer of knowledge that lead to challenging the status quo and to bring new ways of thinking and doing guided by transdisciplinary education.

> *"Changes of late modernity are fundamentally changing the conditions of learning, and if politicians, administrators and educators are to cope adequately with this, as educational researchers, we must be able to develop adequate theories matching the problems experienced at all levels." (Illeris, 2003, p. 404).*

## 6  Circular Pedagogy and Humboldtian Model of Higher Education

In a Humboldtian vision, learner-centred education refers to the opportunity for learners to be prepared as active citizens, able not only to reproduce knowledge, but also to generate it by combining, under the guidance of a teacher, research with learning, and to use this knowledge creatively and pragmatically both for their own development and to move towards new innovative solutions for sustainable education. By approaching learning through research, critical thinking is developed and the whole circuit of knowledge is initiated: when you need knowledge, who gives you the information and how to proceed to generate knowledge. Olo, Korea & Rego (2021) present research-based learning and academic freedom, research and learning as the core features of the Humboldtian model in HEIs. The authors see this model as having impact on the development of teaching by redesigning pedagogies to enable the measurement of students' knowledge level and in research by redesigning pedagogies to ensure knowledge or/and technology transfer that would help in meeting sustainability challenges. Our circular pedagogy coalesces around the scientific family of students, teachers, and researchers, giving them interchangeable positions to generate new ideas and to shape a communion of education in the spirit of scientific truth and an emblematic landmark on how to ensure the quality of higher education. Greenway, McLinden, and Matthews (2021) see a key challenge for HE as reviewing selected pedagogical approaches to ensure that they are aligned with the future needs of learners, universities, employers and, in a word, society. We envision a functioning circular pedagogy enhanced by the evaluation of pedagogical approaches that adequately prepare students for smart and sustainable learning that enable them to become global citizens.

Building on Humboldt's idea of the university as a unit of research and teaching, Vogt, and Weber (2020) address students' needs for action knowledge to understand transformative science and to learn in an environment in which transformative education and transformative science belong together. We envision that our circular pedagogy could offer students the opportunity to change their role from passive recipients of knowledge to creators and providers of knowledge, although transformative education requires: i) psychological restructuring for effective learning to take place, ii) deep critical reflection on previously held beliefs, iii) change in students' habits of thought and action and iv) insightful determination of what to reject and what to replace previous knowledge with. Therefore, it is essential to build on the facts that have contributed to such transformation so that transformative pedagogies are embedded as part of our novel circular pedagogy seeking to improve existing educational models. Furthermore, there are some approaches in the literature to modernise the Humboldt principle, which imply the circularity within the educational process between the actual learning, research and teaching, with an emphasis on true specialists in education who cannot be trained by simply transmitting a set of established truths, but only by active involvement in

scientific processes. In other words, not a provision of certain truths, but only involvement in research processes allows students to learn science (Suleimenova, Suleimenov, and Egemberdyeva, 2019). Consequently, the actions that create the circular frame of learning, research and teaching can be observed through a continuous process where the student acquires and consolidates knowledge directly as a result of scientific research, which he/she carries out in collaboration with a teacher supervisor, creating a learning environment where researchers, teachers, and students interchange their roles as they embrace the learning continuum where they develop transferable learning, teaching and research capabilities.

## 7   Conclusions

Uncertainty arises from the timing of the change in position between learner, teacher and researcher in this circularity and the impact of technology on increasing or decreasing the speed of this change. Even if research should be the basis of all learning at university, knowledge production should follow a cycle of activities in which all members of HE should adapt their educational roles as to raise students' achievements and aspirations by teaching them how to question circumstances and reflect critically on knowledge, i.e., develop their intellectual capacity. Students should understand that this will not only lead to a higher level of engagement but will give them a special lifelong approach to achieving their full potential. The notion of the scientific community must be established so that HE does not lose what is constitutive for itself: the development of competences and research-based reasoning capacities. Students need to be able to handle complex and ambivalent information situations independently. This essential competence is necessary for all academic staff and can best be imparted by teachers who are active researchers, as research work requires this competence more than any other activity.

Due to changes in today's world, HEIs, through students, teachers, and researchers in their interchangeable roles on one hand, and consortiums, on the other hand, have become more focused on knowledge production, innovation, and collaboration, rather than just education. Directing academic learning environments to becoming sustainable ones is emerging as a strongly promoted idea, stimulating innovation in teaching, learning and research, focusing academic interests on student needs and expectations, placing transdisciplinarity as the way forward, and opening up to flexible routes of teaching and learning, all urging us to promote new innovative pedagogies, such as our circular pedagogy for higher education.

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