Applications of Heutagogy in the Educational Use of E-Portfolios

Aplicaciones de la heutagogía en el uso educativo de e-portfolios

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Abstract
Preparing students for the complex and changing nature of the workforce has become an overriding objective within higher education. New pedagogies, which incorporate both informal and formal learning and support personalization of learning, are central to this objective. Educators are required to reassess the use of traditional pedagogies, as they attempt to foster development of skills and competencies for lifelong learning. Heutagogy, or self-determined learning, is a learning theory that addresses this need, giving students agency in determining what and how they learn. The theory is based in the principles of learner agency, capability and self-efficacy, reflection and metacognition, and non-linear learning, and when used with technology can be a powerful instructional approach for building students' self-directed and lifelong learning skills. A compelling example of this is the e-portfolio. As a platform and assessment tool, the e-portfolio spans the spectrum of lifelong learning, as well as encompasses both formal and informal learning of the individual learner and addresses critical aspects of learning and reflection, showcasing the learner's acquired skills and competencies. Based on successful cases in the literature, this article discusses the principles of heutagogy, the pedagogy-andragogy-heutagogy (PAH continuum) and its application in online learning environments, and the use of the e-portfolio in further cultivating and advancing self-determined learning. The article also offers recommendations for future practice and theory.
Key Words: Self-determined learning, heutagogy, e-portfolios, social media, blogs, PAH continuum (pedagogy-andragogy-heutagogy), higher education

Resumen
Preparar a los estudiantes para la compleja y cambiante naturaleza del mercado de trabajo se ha convertido en un objetivo primordial en el contexto de la educación superior. Para alcanzar este objetivo, es crucial partir de nuevas pedagogías, que incorporan tanto el aprendizaje formal como el informal y que apoyan la personalización del aprendizaje. Se requiere que los educadores revalúen el uso de pedagogías tradicionales, a medida que intentan fomentar el desarrollo de habilidades y competencias para el aprendizaje permanente. La heutagogía, o el aprendizaje autodeterminado, es una teoría del aprendizaje que aporta a los estudiantes la gestión del aprendizaje para determinar qué y cómo aprenden. La teoría está basada en los principios de la gestión del aprendizaje, la capacidad y la autoeficacia, la reflexión y la metacognición, y el aprendizaje no lineal, y puede ser un enfoque de enseñanza poderoso cuando se emplea utilizando tecnología para el desarrollo de las habilidades de autodirección y aprendizaje a lo largo de la vida de los estudiantes. Un ejemplo persuasivo es el e-portfolio. En tanto que plataforma y herramienta de evaluación, el e-portfolio abarca el especto de aprendizaje a lo largo de la vida, así como aúna el aprendizaje formal e informal del aprendiz individual, aborda los aspectos críticos del aprendizaje y la reflexión y la demostración de las habilidades y competencias

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adquiridas por el alumno. Partiendo de casos exitosos en la literatura, este artículo discute los principios de la heutagogía, la pedagogía-andragogía-heutagogía (continuo de la PAH) y su aplicación en entornos online, y el uso del e-portfolio para seguir cultivando y desarrollando el aprendizaje autodeterminado. El artículo también ofrece recomendaciones para la práctica y teoría futuras.
Palabras clave: Aprendizaje autodeterminado, heutagogía, portafolios electrónicos, medios sociales, blogs, continuo de la PAH (pedagogía, andragogía, heutagogía), educación superior

1. Introduction

Multiple forces are converging within higher education that have the potential of broadly impacting institutions, from education offerings and technology selection to curriculum design and delivery. Ehlers and Kellermann (2019) categorized these drivers of change into four areas: a focus on future skills, multi-institutional pathways to education, establishment of lifelong learning organizations, and personalization of learning. The 2019 Horizon report further reinforced these findings, highlighting key challenges facing higher education. These challenges include: an increased demand for digital learning experience; improved digital fluency and instructional design expertise; the need to address students' achievement gaps as they transition to the workforce; and finally, the need to rethink the practice of teaching. Other drivers include an evolving job market that requires specific employee skills such as self-efficacy, autonomy, self-motivation, communication and cooperation, reflection, digital literacy, creativity, agility, and lifelong learning and demanding a stronger focus on learner-centered and lifelong learning (Ehlers & Kellermann, 2019; Redecker, 2017). Employers are also exhibiting an increased willingness to accept credentials other than a formal degree, thus creating a need for recognition of informal and prior learning (Ellucian.com, 2019; https://microcredentials.eu).

These forces have instilled a need within institutes of higher education to reassess traditional practice. Institutions are being challenged to rethink education business models, and educators their teaching and learning approaches. This includes moving toward support of prior learning recognition, personalization of learning, modular education offerings (e.g., certificates), and lifelong learning (Alexander et al., 2019; Ellucian.com, 2019). In its vision of education for 2030, the OECD (2018) outlined the following key focus areas: development of resilient solutions that can adapt to continuously changing environments; promotion and nurturing of learner agency; inclusion of the extended community of the student within the learning environment; and development of "change agents" with "a broad set of knowledge, skills, attitudes and values in action" (p. 5). The Horizon report also highlighted the need for change within higher education institutions; for example, through cultures of innovation, redesign of learning spaces, and a rethinking of educators' teaching practices (Alexander et al., 2019). All of these factors influence the educator in the classroom, who is faced with challenges of promoting learner autonomy and agency, personalizing learning, and supporting the development of a wide variety of skills and competencies that allow students to seamlessly transition to the workforce.

However, guidance for navigating these new frontiers remains elusive. Students are accustomed to didactic pedagogies that focus on passive, standardized consumption of information, and scarce research is available on approaches in higher education that foster lifelong learning, and in particular, pedagogies that use media-enhanced curriculum (Sangrá, Raffaghelli, & Guitert-Catasus, 2019). New theories and constructs that emphasize learner agency, active engagement in the learning process, and lifelong learning—with the support of technology—are vital for creating the kinds of new learning environments needed.

One such learning theory is heutagogy, or the study of self-determined learning, which is founded upon the central principle of learner agency, as well as principles of capability and self-efficacy, reflection and metacognition, and non-linear learning paths (Hase & Kenyon, 2000; 2007). Heutagogy is often understood as residing within a learning continuum, from didactic pedagogy to andragogy (self-directed learning) and finally to heutagogy/self-determined learning (pedagogy-andragogy-heutagogy or PAH continuum) (Garnett, 2013; Luckin et al., 2010). The PAH continuum can thus be considered a useful instructional theory for developing and promoting learner agency, reflection, and meta-cognition skills, and competencies and capability and ultimately lifelong learning skills. Using the e-portfolio as the medium for realizing self-directed and self-determined learning, educators can move students along the PAH continuum and position the e-portfolio as the entry point for developing networks of formal and informal learning and as a foundation for sustaining a lifelong learning ecology.

This article presents definitions of heutagogy and its respective application within education, as well as a description of the PAH continuum and the role of technology. It then discusses e-portfolios and their potential use as a foundational platform for realizing heutagogy in media-rich education environments by presenting successful experiences from the literature that link heutagogy and e-portfolios in higher education.

2. Heutagogy Defined

Heutagogy, first identified by Hase and Kenyon in 2000, can be considered a theory of learning, where the learner is enabled to independently learn through a process of discovery. Heutagogy has emerged from earlier learner-centered learning theories and concepts across psychological, organizational, and educational disciplines, drawing on humanism, self-determination, complexity, reflective practice, constructivism, andragogy, self-regulated learning, learner self-efficacy and capability, the zone of proximal development, and transformative learning (Blaschke, 2012).

Hase and Kenyon (2007) define heutagogy as the study of self-determined learning, which applies a holistic approach to developing learner capabilities with the learner serving as "the major agent in their own learning, which occurs, as a result of personal experience" (p. 112). *Learner agency* is based in theories of humanism (Maslow, 1943; Rogers, 1961) and advocates the innate ability of the learner to make decisions about his or her learning in a process of self-actualization. The first principle of heutagogy is learner agency. Agency is central to heutagogy, as learners decide their learning path, including what they will learn (content), how they will learn it (methods), and whether and how learning has been achieved (assessment).

The second core principle of heutagogy is that of *capability* (Stephenson, 1992) and self-efficacy (Bandura, 1977). Through a process of exploration and experimentation, students develop a sense of accomplishment (self-efficacy) with each learning success, thus triggering an intrinsic motivation to learn and the ongoing development of competency. Capability develops over time with each achievement and acquired competency, enabling learners to apply new skills to unique and unfamiliar environments.

The third principle of heutagogy is *reflection and metacognition*, in which learners undergo a process of double-loop learning, reflecting not only upon what they have learned (e.g., new knowledge) but how they have learned it (e.g., learning process), as well as how new knowledge and skills influence their values and beliefs (Schön, 1983) This process of reflection supports development of metacognitive skills, as students learn to critically evaluate their knowledge and thinking through the

process of reflection, eventually leading to transformative learning experiences (Mezirow & Associates, 1990).

The fourth and final principle is *non-linear learning* (Blaschke, 2012), which creates the framework of an open learning environment, defined by the learner. Elements of a learning environment designed for heutagogy include exploration, creation, collaboration, connection, sharing, and reflection (Blaschke, 2015).

These four principles of heutagogy are the pillars of the learning theory, describing the subprocesses of learning with which the learner engages: self-determined (emphasizing learner agency), transformational (occurring as learner self-efficacy, self-reflection, competency and capability develop), and non-linear (learner-defined and often chaotic) learning (Reigeluth & Carr-Chellman, 2009). In a heutagogic learning environment, the student is in control of the learning journey, defining the learning path — what will be learned and how — as well as how learning will be assessed. In this scenario, the instructor takes on the role of guide, or what Hase (2014) refers to as the *learning leader*. The role of the instructor is not diminished, but rather focuses on guiding the student on his or her journey, shifting control and responsibility for the learning process to the student, encouraging the learner to actively engage in the individual learning process.

Heutagogy also shares characteristics with learning ecologies. For example, both bring value to learners, instructors, life-wide education and society as a whole (Jackson, 2007). Both also share the central principle of developing metacognitive skills of reflection, critical thinking, and learning to learn. They also both have the goal of creating reflective practitioners, learners who are capable of engaging in an ongoing process of theory (knowledge) application and reflection in order to find solutions to new problems in unfamiliar and complex environments (Schön, 1983). Like learning ecologies, a heutagogic learning environment is dynamic and responsive, chaotic, self-organizing and individually directed, living, diverse, informally structured, and continuously adaptive and emerging (Siemens, 2007; Hase & Kenyon, 2007).

Since its inception, heutagogy has been found to be applicable in many contexts, from secondary to higher education to vocational education (training) and informal learning environments (e.g., communities of practice). Examples of application of heutagogy have been documented within vocational (Gardner et al., 2008; Hase, 2011; 2009; Hase & Kenyon, 2000; 2007) and higher education environments and across numerous disciplines such as education, nursing, journalism, and geography (Blaschke, 2014a, 2014b; Blaschke & Brindley, 2014; Canning, 2010; Canning & Callan, 2010; Cochrane et al., 2010; DeMers, 2019; Dick, 2013; Glassner & Back, 2020; Maykut, 2019).

3. The Pedagogy-Andragogy-Heutagogy (PAH) Continuum

Heutagogy can be understood as occurring within a continuum of pedagogy-andragogy-heutagogy, or PAH continuum, as shown in Figure 1 (based on Canning, 2010). Eberle and Childress (2009) first discussed heutagogy as part of a continuum, but as moving from traditional (didactic) classroom teaching to andragogy then heutagogy.

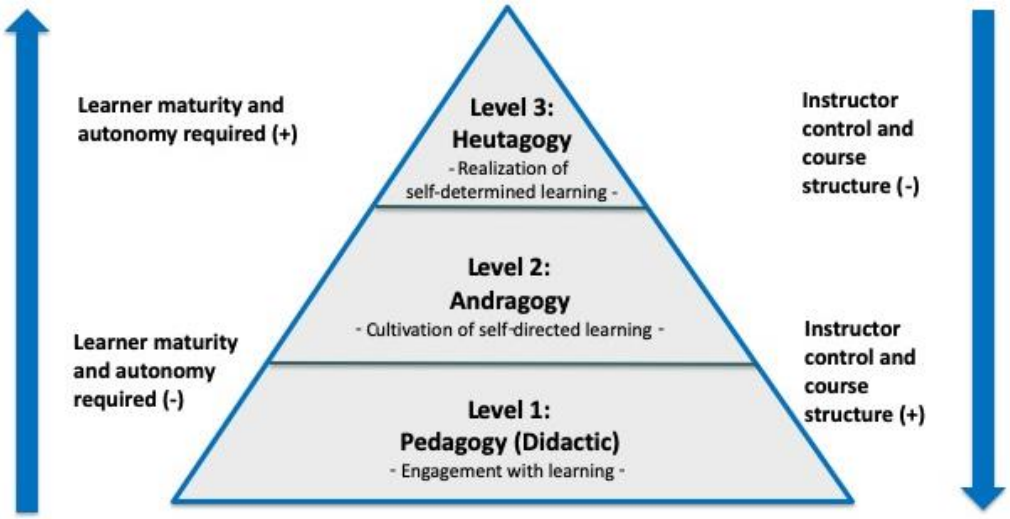

Figure 1. The PAH continuum (Blaschke, 2012, licensed under a Creative Commons CC-BY 4.0 License (http://creativecommons.org/licenses/by/4.0/).

The first level within the continuum is that of didactic pedagogy, where "pedagogy is a teaching theory rather than a learning theory and is usually based on transmission" (McAuliffe et al., 2009, p. 14). According to Reigeluth and Carr-Chellmann (2009), didactic pedagogy could also be considered an instructional theory. The instructor determines curriculum content and structure and the sequential order and means of content delivery, for example, through lectures and readings. At the next level of the continuum is andragogy, or self-directed learning: "…a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18).

In an andragogic environment, course content is less structured, and learners take increased control in organizing and directing learning, adopting a more autonomous role. As learners progress through the continuum, they become more autonomous, able to make all learning-related decisions (e.g., structure, content, knowledge source, way of learning), including whether or not learning goals have been achieved and how and to the degree their goals have been achieved (e.g., self-assessment). In this way, the PAH continuum is considered a progression toward further learner autonomy.

Lucken et al. (2010) first formulated the phrase PAH continuum, identifying key elements within each pedagogical type, such as the locus of control, educational section, cognition level, and the context of knowledge production (Garnett, 2013). McKeown (2011, as cited in Gerstein, 2013) adopted a different view of the continuum, one that focused on the student and teacher perspectives: learner dependence, resources and reasons for learning, focus of learning motivation, and the teacher role. Kanwar et al (2013) further expanded on McKeown's version by incorporating goal setting, learning systems, and types of learning.

The PAH continuum could be considered an *instructional theory*, as it is situation-based and "is done purposely to facilitate learning" (Reigeluth & Carr-Chellman, 2009, p. 6). When applying the PAH continuum to classroom design, instructors and designers can employ a variety of *instructional methods* (e.g., problem-based learning, experiential learning, direct instruction, and instructional

simulation) to realize more learner-centered learning (Reigeluth & Keller, 2009, p. 31). The construct of the PAH continuum is highly contextual, as students (and instructors) may find themselves at different places within the continuum, thus requiring scaffolding of the learning experience and guidance by the instructor in advancing students along the continuum toward more self-determined learning.

4. The Intersection of Heutagogy and Technology

Ongoing technological developments offer new opportunities for learners to explore and learn independently, with tools and media supporting self-determined learning. For this reason, Anderson (2010) described heutagogy as a net-centric theory of learning, highly applicable to online and technology-enhanced learning environments. The specific affordances of technology and social media such as blogs, wikis, and social networks, allow heutagogy to thrive as it capitalizes on these technological affordances: the ability to create and co-create content, connect and collaborate with others inside and outside of the classroom, share the results of the learning experience and give students an opportunity to learn from each other, and to reflect upon what has been learned and how it has been learned thus making learning more personalized, self-directed, and self-determined (Anderson, 2019; Blaschke, 2016; Conole, 2011; Gerstein, 2013; McLoughlin & Lee, 2007; Sharpe, Beetham, & DeFreitas, 2010).

Within social networks, students can also extend the reach of their knowledge resources, easily connecting with other learners, teachers, scholars, and researchers, and other networks, in essence making the world their classroom both today and throughout their lifetimes. These affordances of social media are not simply characteristics of the media, but are unique elements that promote and support specific activities being undertaken by the student.

When applying the PAH continuum in classroom environments, one could utilize Gibbons and Rogers' (2009) framework of layers, where *instructional methods* can further represent the designer or instructor's response to a "design problem" within the domains of: content, strategy, control, message, representation, media-logic, and data management (pp. 18-20). Following the Gibbons and Rogers (2009) framework, the media used and their technological affordances could represent the *representation* and *media-logic layers*, while their *strategy* and *message layers* would align with the principles of heutagogy and the instructional methods used to realize these principles.

The first principle of heutagogy learner agency is easily realized through the web environment, as it allows learners to explore at will, deciding what they will learn and how they will learn it. The ability to embrace learner agency allows students to personalize the learning experience and doing so is critical, for example, in conducting active research, finding new sources of information, and in connecting with other researchers, academics, and experts online. Students are also able to decide who they will connect with and when, as well as to decide on the resources and sites that are of interest to them in their pursuit of knowledge, thus promoting a transition from formal to informal learning.

The second principle of heutagogy, self-efficacy and capability, is further supported by the web, specifically those media that have emerged during Web 2.0, such as blogs, collaborative spaces, and networking sites, which give users the ability to create new content, to connect and collaborate with others, and to openly publish. Self-efficacy, that is the confidence of the learner in his/her ability to perform a skill or set of skills, develops with the use of each new media tool. As the learner acquires new digital skills and competencies (e.g., by creating a blog, collaborating with others online), his or her self-efficacy continues to develop, often through trial and error, and the learner becomes more capable over time, and better able to transfer skills to new environments.

Through the use of online blogs, students can create new content, as well as reflect upon and critically evaluate that new knowledge, thus further developing skills of reflection and metacognition — also central principles of heutagogy. And finally, the Internet environment supports non-linear learning (fourth principle of heutagogy) as the learner can move uninhibited through the web, searching for new knowledge (e.g., by accessing open education resources in news sites, journals, blogs, videos) and acquiring new skills (e.g., learning through MOOCs and YouTube videos).

5. The E-Portfolio as Platform for Heutagogy

The e-portfolio is one tool that can be effectively used as a medium for realizing heutagogy and as a means for documenting and showcasing learner competencies both inside and outside of the higher education classroom, while also having the potential to incorporate a wide range of technologies (depending on the design). The e-portfolio has been described as a powerful pedagogical tool used for the purposes of tracking the learning process, displaying evidence of acquired competencies, and developing specific skills such as self-regulation, reflection and critical thinking, and monitoring of cognitive development — although research is limited in demonstrating the effectiveness of e-portfolios in realizing these aims (Scully, O'Leary and Brown, 2018). That said, research continues to emerge such as recent research by Farrell and Seery (2019), which indicated that through the use of e-portfolios, students are able to critically reflect on and self-evaluate learning, self-regulate learning by assessing and monitoring learning progress, develop self-efficacy as they become more assured of their learning approach, and to apply what they have learned within the context of the classroom, as well as to professional and personal contexts.

Barrett's (2010) diagram of the two faces of the e-portfolio serves as a helpful framework for understanding e-portfolios (see Figure 2). The diagram encompasses both formal and informal learning of the individual learner (personalization) and presents two objectives of the e-portfolio: (1) learning and reflection (personal development), and (2) showcasing (professional development), thus creating a framework of learning, skills, and competencies. E-portfolio design and use can also embody heutagogic principles of learner agency, capability and self-efficacy, reflection and double-loop learning, and non-linear learning, as well as incorporate design elements of content, creation, collaboration, connections, sharing, and reflection.

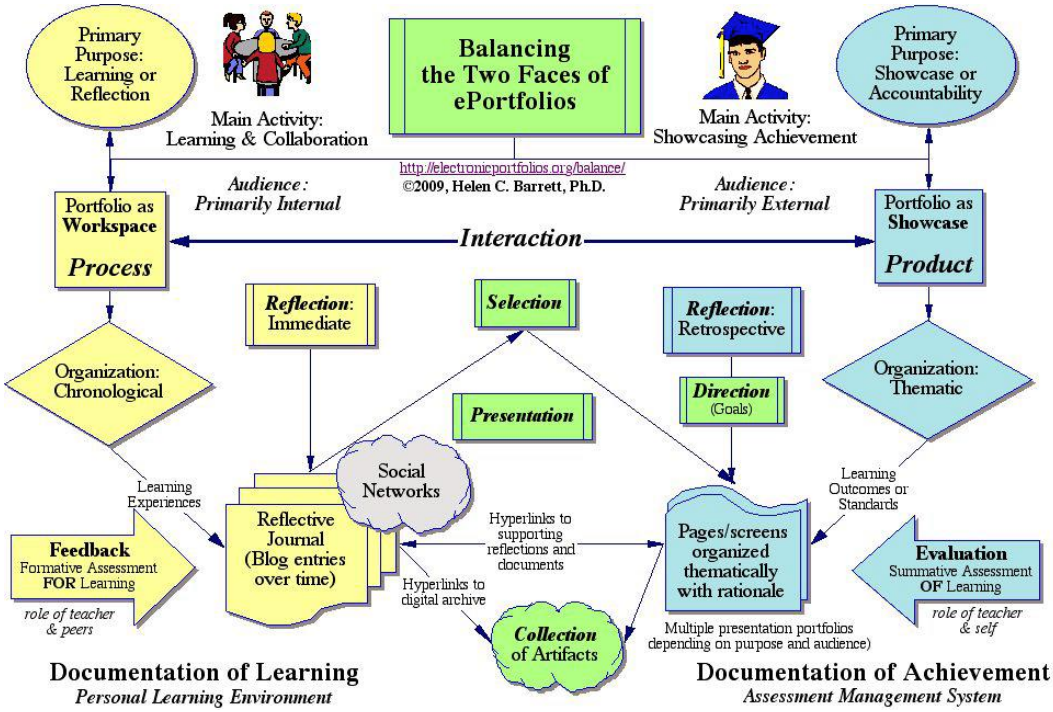

Figure 2. The two faces of e-Portfolios (Barrett, 2010).

Maina and Garcia (2016) also presented the view of e-portfolios as a self-development strategy for the learner. However, the role of the e-portfolio can be expanded to become a platform for ongoing learning and reflection and a demonstration of acquired skills and competencies – thereby forming the basis for lifelong learning (Barrett, 2006; 2010). Incorporation of social media presents new possibilities to further expand e-portfolio use, for example, by including blogs for reflection, wikis for online collaboration, and social networking sites for sharing information and maintaining professional connections (Blaschke, 2014b; Cochrane & Rhodes, 2011). The e-portfolio is no longer strictly a tool, but rather "a place, platform, a sounding board" (Farrell & Seery, 2019, p. 85). Referring back to the Gibbons and Rogers (2009) framework of layers, e-portfolios would be defined as the *data management layer*, a place that stores the tangible products generated by the learner, which have been derived from the combination between instructional (authentic tasks) and media (social media) methods.

One instructional design method for incorporating social media into classroom activities that is advocated by Blaschke and Brindley (2015) is Prensky's (2010) framework of matching desired skills (verbs) with the technological type and affordances of the media (nouns). Each can be effectively incorporated into the learning activities used in the online classroom or directly into the e-portfolio itself, an approach applied by Blaschke and Brindley when incorporating the e-portfolio into an online graduate program (Table 1, described later in this article). To use the e-portfolio effectively, Scully et al. (2019) stressed the importance of establishing a foundational pedagogical intent, emphasizing that how the e-portfolio is implemented is critical to realizing positive learning outcomes. This finding is also supported by Zawacki-Richter, Haft and Bäcker (2011), who reiterated the critical need to position the e-portfolio within courses that are designed based on competence-based models and that present the student's work and the competencies and skills achieved.

6. Successful Examples of Heutagogic Principles Applied to E-Portfolios

Different authors have reported successful experiences of the educational use of technology from a heutagogic perspective. E-portfolios, based on blogs or on other more specific e-portfolios systems (media methods), are one of the tools that have with more frequency been connected to heutagogic design elements (instructional methods), due to the characteristics described above. For instance, Churchill (2008) described the educational use of blogs in an Education Information Technology postgraduate course in Hong Kong as an assessment requirement. The educational set up showed the relation between the course activities in the blog and the heutagogic design elements of content creation, collaboration, connections, sharing, and reflection. Students posted learning reflections, featuring artifacts created through the learning tasks related to the course topic, presented completed tasks, shared ideas, and commented on each other's contributions on a regular basis. The appeal of the learning experience was demonstrated through the students' deep appreciation of the "connections" and "sharing" heutagogic elements of the blog activity; and concretely, the possibility of reading blogs of others, receiving comments and previewing tasks of others and reading feedback received. These three instructional activities were considered effectively realized through the use of blogs. Of note is Churchill's (2008) finding that providing feedback on individual blogs and keeping track of updates was time-consuming for the instructor.

Another example is described by Marín (2020), who used e-portfolios in an Education postgraduate courses in Germany. The e-portfolio, which was based on a blog, was configured as the primary module assessment for the presentation of learned competencies and was assessed against different criteria (e.g. inclusion of the working project prototype with a minimum of content). Although the tool for the e-portfolio was pre-defined at the start of the course, students still had the freedom to openly decide what they wanted to do for their group project, which was documented in the e-portfolio, as well as in individual learning reflections. Therefore, students exercised learner agency in that they could choose their learning goals (what do I want to learn with this project?), the topic and educational settings of their project, what they wanted to create (the digital product), and how they wanted to present the project in their e-portfolios (layout, design, content, artifacts). These aspects connected to the heutagogic design elements of content and creation, as well as supported acquisition of digital literacy skills. Furthermore, the rather varied uses and group dynamics of the e-portfolio was a good example of how heutagogy worked in this case. For example, the different student groups used the e-portfolio for documentation, reflection, collaboration and presentation — which aligns with the central design principles of heutagogy. In terms of outcomes, students reflected on the effectiveness of the learning experience due to the combination of theory and practice, as well as on its efficiency (time-consuming activity), and appreciated the way of working (appeal).

Jimoyiannis, Schiza and Tsiotakis (2018) and Jimoyiannis and Tsiotakis (2016) described e-portfolios based on Mahara—an open source e-portfolio software—in the context of an Education postgraduate course in Greece. The Mahara blog was used for content creation as part of the assessment. The instructor acted as e-moderator "by setting the context, the expectations and the processes of students' self-directed learning" (Jimoyiannis & Tsiotakis, 2016, p. 4). Collaboration, connections, and sharing ideas and knowledge were the social heutagogic design elements that can be identified as an instructional method from the case. However, other individual heutagogic design elements were also present: reflection and content creation. Furthermore, four elements connected to those elements were looked at: engagement, interaction-reflection, creativity and cohesion. The findings were positive regarding the effectiveness of the e-portfolio in terms of promoting students' engagement into the e-portfolio activities and self-directed learning, as well as enhancing motivation (appeal) and showing "promising evidence of a decentralized learning community" (Jimoyiannis & Tsiotakis, 2016, p. 7).

Tur, Urbina and Forteza (2019) described e-portfolios based on blogs in a teacher education undergraduate course in Spain used over four academic years. The instructional method in the individual e-portfolios consisted of weekly blog posts where students would "reflect on new content and changes in their educational viewpoints along with a digital artefact" (Tur, Urbina and Forteza, 2019, p. 21). As formative assessment, a rubric to assess student performance in the construction of their digital process e-portfolio was implemented by the teacher after each week's blog post. The rubric was created by the teacher and presented to students at the beginning of the course. In this case, the instructional method incorporated the most relevant heutagogic design elements of content creation and reflection. The latter was enhanced through the use of the rubric, since as formative and transparent assessment measure, it contributed to fostering student autonomy and to increasing student engagement and self-awareness of the strengths and weaknesses of their strategies for learning. However, the use of the rubric was also a challenge in terms of balance between assessment and self-regulated learning; while the rubric brought transparency to the assessment process, it also somewhat undermined the intended objective of having students self-regulate their learning. The authors also remarked on the decline in instructor efficiency with the method: “giving students weekly feedback is an enormous workload for the teacher” (Tur, Urbina & Forteza, p. 31).

An example of e-portfolio use in a U.S. graduate program is described by Porto (2008) and Porto, Blaschke and Kurtz (2011). Initially, the e-portfolio was implemented in the form of a final assessment in the graduate Capstone course. Students were required to build their e-portfolio to showcase their work (artifacts) while in the program. As the long-term objective of the program was to develop reflective practitioners who would be managers in the field of online and distance learning, the e-portfolio was an appropriate tool for assessment of student learning, in addition to a means for students to showcase their work within the program (Bernath & Rubin, 2003; Walti, 2004). The learning theory used for the e-portfolio was primarily self-directed learning, where the instructor dictated specific elements that must be included, but students chose the online platform for portfolios, as well as the structure, design, and content. With the proliferation of social media, instructional teams began experimenting with the media as a way to incorporate more authentic assessments into the program (Porto, Blaschke, & Kurtz, 2011). In response, the authors undertook an extensive redesign of the Foundations course of the program using heutagogy as the learning theory, incorporating authentic assessments (called skill-builders) that were based in social media. The e-portfolio was then introduced at the very start of the program, as an ongoing activity, with students adding artifacts and learning reflections throughout the program (Blaschke, 2014b). Examples and descriptions of these skill builders, the learning objectives and desired skills, the social media tool used, and time frame allotted for the assessment are shown in Table 1.

Table 1. *Example skill builders* (based on Blaschke, 2014b, licensed under a Creative Commons CC-BY 4.0 License (http://creativecommons.org/licenses/by/4.0/)

Learning Activity	Learning Objectives	Desired Skills	Social Media	Time Frame
E-portfolio, including reflective learning journal	• Think critically about individual platform requirements • Review and choose an e-portfolio platform • Create new content • Reflect upon content and learning process	Design and create; think critically, deeply, and logically; share knowledge; share experience; give advice; express yourself	E-portfolio (e.g., wiki, blog, other)	Weeks 3-12
Twitter	• Search for and discover potential research resources • Share information discovered with others • Communicate and connect with others	Communicate (read, write, discuss, interact); collaborate; search; explore; listen; connect; share; think critically; reflect; support others; build community; promote (self); exchange	Twitter	Weeks 3-12
Online mind map	• Reflect upon understanding of distance education • Design and create new content based on current and new knowledge • Share ideas and experience • Track learning progress	Communicate, explore, share, think critically, reflect	Mind mapping	Weeks 3-12
Collaborative group project	• Think deeply about and reflect upon course readings • Interact and collaborate with other students to evaluate and create new content	Collaborate; communicate (write, read, discuss, interact); construct knowledge (individual and group); socialize; navigate; negotiate; solve problems; think deeply, critically, and logically; reflect; evaluate	GoogleDocs	Weeks 4-12
Annotated bibliography	• Research and find information • Create new content • Share resources and content	Communicate (read, write, discuss, interact); collaborate; search; inquire; compare; combine; think critically; reflect; observe; share; build community; promote (self); distribute	Diigo/ScoopIt!	Weeks 6-8

Learning activities, as well as the e-portfolio, were assessed using specific rubrics, and formative feedback was provided through the semester. The final e-portfolio was assessed along the categories of: content (description, analysis, reflection, and learning activities), design (presentation and communication), timeliness of posts, and technical aspects (grammar, spelling, and inclusion of references).

Figure 3 shows an e-portfolio example from a graduate of the program, who used her e-portfolio to not only showcase skills and competencies gained both inside and outside of the program, but also to communicate her professional goals and to incorporate additional formal, non-formal, and informal learning after graduating from the program.

Figure 3. Example MDE student e-portfolio (https://brendaledfordeportfolio.weebly.com/).

In many ways, the cases from the literature of using e-portfolios represent both faces of the portfolio (as a process and as a product) described by Barrett (2010). The different examples included building e-portfolios as a process, which includes learning reflections and artifacts, and as a product, for showcase purposes and in different educational settings in terms of tasks and geographical contexts. For instance, in the case from Porto et al. (2011), the original e-portfolio was a showcase of student accomplishments, while later forms of the e-portfolio incorporated reflective learning journals and skill builders based in technology, thus supporting a pattern of ongoing reflection and competency development. Currently, the e-portfolio is assessed at the end of the semester; skill builders are completed throughout the semester and are assigned pass/fail grades, with the instructor providing extensive formative feedback on improving student work for each skill builder learning activity. The results of the skill builders are then included in the final portfolio.

As a result of this approach - providing formative feedback throughout the semester and then assigning a final grade at the end of the semester - has resulted in a more formative approach to assessing the e-portfolio. This allowed for exploration, risk-taking, and failure – much in line with calls for new forms of authentic assessment that focus on a backward design in identifying desired learning outcomes, then helping students to get there (Lederman, 2019). This is also true for rubrics, a common instrument to evaluate e-portfolios (present in some of the case examples), as a way of making transparent how evaluation of the learning processes and products takes place through

evaluative criteria and the merit determination per each level of the rubric (Davidson, 2005). The e-portfolio design in the Porto et al. example also supported a learner-centered instructional design, personalized learning pathways, and development of digital literacy and technology skills as recommended in the latest Horizon Report (Alexander et al., 2019). However, giving the possibility to the learner to fail without penalty and for ongoing improvement has the disadvantage of increasing instructor workload.

7. Discussion

In the examples presented here, principles of heutagogy were implemented using a variety of instructional methods and through the use of authentic assessments. For instance, by incorporating social media skill builders and a reflective learning journal, the Porto et al. (2011) e-portfolio embodied the principles of heutagogy: learner agency, capability and self-efficacy, reflection and double-loop learning, and non-linear learning. As the central platform for student discovery and learning, the e-portfolio created an online development space for learners to continually expand upon and build their self-directed and self-determined learning skills. The e-portfolio also brought together fundamental characteristics of the learning ecology and heutagogy, primarily that of learner agency. Sangrá et al. (2019) supported this notion, as well as use of the PAH continuum as an instructional theory, finding that "the concept of LE (learning ecology) could combine self-determined learning as a motivation for learning in the mid- and long-term, and self-directed learning as a motivation and direction of learning across immediately available contexts" (p. 15). In a sense, the e-portfolio becomes a living testimony to the learner's ability to learn autonomously, showcase skills and competencies acquired through both formal and informal learning, and to create a learning network for further personal and professional development.

Similarly, the principles of heutagogy are present in different forms in the other cases, which varied in the emphasis on the principles applied and was dependent on the learning activities that were proposed. Double-loop learning and reflection through rubrics were main elements in the case of Tur, Urbina and Forteza (2019), although content creation was also a strength. Capability and self-efficacy were promoted through content creation, as exhibited in the cases from Jimoyiannis, Schiza and Tsiotakis (2018), Jimoyiannis and Tsiotakis (2016), and Churchill (2008). In addition to those principles, learner agency and non-linear learning were boosted as shown in the case from Marín (2020), through the provision of choices for students to develop their projects and by allowing them the possibility to review their work and reflect on it at any time.

As indicated in the cases from the literature that are presented here, the use of an e-portfolio combined with heutagogic principles can support students in active, learner-centered learning. Through its learner-centered approach to teaching and learning, incorporation of heutagogic principles within a course design could help address the evolving and emerging challenges currently faced by instructional teams. Incorporation of these principles within the framework of the PAH continuum can support personalization of the learning experience, promote learner agency and informal learning, and develop self-directed, self-determined, and lifelong learning skills, such as reflection and critical thinking. When merged with powerful technological media such as the e-portfolio as the learning space, platform, and media tool, application of the PAH continuum could potentially transform the student experience to a more interactive, engaged, and intrinsically motivated experience for students.

At the same time, the main sacrifice of incorporating heutagogic principles must be acknowledged. Primarily, the decrease in instructor efficiency must be taken into consideration when building in principles of heutagogy. Adopting heutagogic principles within the classroom can be challenging, as it requires a transition from an instructor-controlled learner environment to one in which the learner

is directing and controlling his or her learning. Learner agency is central to heutagogy, so promotion of that agency is critical to its success. For the instructor, this requires taking on a new role that Hase (2014) described as a learning leader, one who must "think about ways to incorporate these media in designing learning experiences" (p. 101). According to Hase, characteristics of the learning leader include "the capacity to accept and manage ambiguity, the ability to foster engagement, the capacity to learn, and the ability to use open systems thinking" (pp. 103-104). Helping students adopt and embrace a more self-directed and self-determined learning approach is an additional challenge, and the role of the learning leader gains additional significance when students do not yet have the adequate knowledge and skills to engage in heutagogic learning. For instructors, this can result in less instructor efficiency, as the instructor may spend substantial time providing feedback to the student in order to help them in becoming more self-directed and self-determined in their learning (Churchill, 2008; Marin, 2020; Tur, Urbina & Forteza, 2019). To improve instructor efficiency, the instructor can utilize supporting tools (e.g. receiving updates via RSS, as suggested by Churchill (2016)) or by encouraging paired/group work instead of individual work and alternating the timing of providing feedback (as suggested by Tur, Urbina & Forteza, 2019).

For students, becoming a more self-determined learner necessitates that they take more responsibility for their learning, which can result in a sense of chaos and confusion as learners move out of their comfort zones of traditional and familiar teaching and learning constructs (Blaschke, 2014a). Students may not want to accept responsibility for their learning or being active agents within the learning process. This requires that the instructor coax students from their comfort zones and to provide them with a safe learning environment, where the student is allowed to fail without penalty from failure. The instructor will also need to incorporate scaffolding and active intervention techniques to support and help the student move along the PAH continuum, shifting from passive (pedagogic) to more active and self-directed/self-determined learning (andragogic and heutagogic).

To realize heutagogic principles in the classroom, it is essential that students are given ample opportunities for learner agency, for example, through the incorporation of authentic learning activities that allow the learner to explore, create, collaborate, connect, reflect, and share — and most importantly to fail and to learn and recover from these failures (Blaschke, 2020; Blaschke & Hase, 2015). Narayan, Herrington, and Cochrane (2019) identified additional design principles for using mobile and social media in a heutagogic environment. These five design principles include: a) designing activities that encourage participation, personalization and productivity; b) using open and student-owned tools and platforms; c) incorporating authentic learning that supports exploring and experimenting; d) using formative, ongoing assessment; and e) giving the necessary technical support for using media tools.

Some foundational knowledge may be necessary in order for the student to advance to more self-directed and self-determined learning, and this may require traditional forms of teaching. Stoszkowski and McCarthy (2019) reported on learner perceptions of the attributes required in self-determined learning, finding that foundational knowledge of a topic and skills such as self-regulation, self-motivation, peer collaboration and discussion, critical analysis, and research, were necessary in order to be successful in a heutagogic learning environment. At the same time, students also reported that these knowledge and skills were often acquired through the process of moving toward self-determined learning. Once students have successfully made the transition to self-determined learning, Brandt (2013) and Glassner and Back (2020) found that students actually prefer having more agency in deciding what and how they will learn, as opposed to more passive, didactic teaching and learning.

Research into progressive forms of realizing heutagogic principles within various environments and using diverse media continue to emerge. For example, research by Narayan, Herrington and Cochrane (2019) explored use of mobile and social media tools. Anders (2015) and Agonács and Matos (2017)

found that heutagogy is also a promising theory for developing self-determined learning in connectivist massive open online courses (cMOOCs). DeMers (2019) reported on applying heutagogy in the development of an online personal learning environment (PLE) called NEXTREADY that is based in project-based learning and that showcased acquired competences as a form of professional validation. More examples and analysis of platforms such as e-portfolios and PLEs that use self-directed and self-determined learning (PAH continuum) as the guiding pedagogical approach are still needed.

8. Conclusion

As demonstrated in the cases presented here, the e-portfolio can be a practical means for empowering students in developing their self-directed and self-determined learning skills. When it is combined with a course design that is based on heutagogic principles of learner agency, self-efficacy and capability, reflection and double-loop learning, and non-linear learning, the e-portfolio becomes a compelling tool for students to create and collaborate on assignments, connect and engage with others, and reflect upon their learning experiences. The e-portfolio also provides a platform for students to showcase their competencies and skills and to develop a personal learning environment and to create a bridge from formal to informal learning. In addition, the e-portfolio provides opportunities for instructors to support students in becoming stronger agents of their learning, thus moving them along the PAH continuum from passive (didactic pedagogy) to more active forms of self-directed (andragogy) and self-determined (heutagogy) learning.

Although a meaningful way for creating an active and learner-centered environment, it can be challenging to implement an e-portfolio designed for heutagogy. Instructor efficiency can decrease, as increased time is spent in reviewing student work and providing formative feedback. Also, students who are more accustomed to passive learning (didactic pedagogy) may resist becoming active agents of their learning and to taking more responsibility for the learning process. This will also result in an increase in instructional time, as more effort must be expended in guiding students to more self-directedness and self-regulation — and in transitioning through the PAH continuum. Before adopting heutagogic principles within the classroom, instructors will need to take these challenges into consideration, particularly when designing and planning assessment, scaffolding instruction, and planning for interventions to support learner agency and development of that agency.

Since the cases from the literature presented here were purposefully selected, it is not reasonable to generalize the findings. Further research into the use of social media and the e-portfolio in advancing the heutagogic approach is needed, as supported by Sangrá et al. (2019) who found that "few educational applications currently exist, particularly with regard to technology enhanced learning developments" and argued for further research into the formal/informal learning continuum, particularly within adult and higher education and vocational education training (p. 1). At the same time, the cases indicate that e-portfolio development and the application of heutagogic principles have the potential to support the development of student self-efficacy and competency, as well as lifelong learning skills of critical thinking, self-reflection, and digital literacy. In addition, the cases allow us to derive some key prescriptions that could be useful for educators who want to create a more learner-centered classroom by incorporating e-portfolios designed according to heutagogic principles.

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