Finding Balance through Connected Learning Designs: Disentangling Self-Regulated and Co-Regulated Learning in Online Postgraduate Education

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ABSTRACT

The paradigm of lifelong learning has changed our understanding of the possibilities of online postgraduate education for fostering self-regulated learning. Recent research attention has been placed on the role of self-regulated learning in higher education in hybrid, blended or fully online environments. Although the fields of EdTech and online higher education have a significant research agenda in both scale and scope, rigorous research and substantive findings about how students experience the balance across a continuum from self-regulated learning to guided instruction have been limited. The purpose of the current study is to examine and expose learning strategies and practices that support and shape connected forms of lifelong learning in online postgraduate education across contexts. Results are presented from the qualitative component of a broader mixed methods study aiming to explore the phenomenon of interest from the participants' perspective. The findings present three key areas of interest to further the conversation on how to best support lifelong learning in online HE and promote changes in our understanding of self-regulated learning. The article concludes with a discussion of the identified learning strategies and practices used to support learning across contexts to provide more nuanced insights into the factors that support or hinder efforts to foster lifelong, self-regulated and co-regulated learning.

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INTRODUCTION

Developing student self-regulated learning strategies has been an important and consistent debate within research on educational technology (EdTech), lifelong learning and higher education (HE) (Anthonysamy, Koo & Hew 2020; Broadbent & Poon 2015; Zhu, Au & Yates 2016). Although the concept of self-regulated learning (SRL) has a significant history, the recent mainstreaming of online postgraduate education has brought renewed research interest in hybrid, blended and fully online learning environments. Attention has also been placed on faculty development initiatives focused on teaching strategies and curriculum design which provide the conditions to foster student self-regulated learning (Russell et al. 2020). The prominence of research attention and practical initiatives to support self-regulated learning is motivated in part by the wide recognition of self-regulation as one of the core mechanisms of learning (Allal 2016), as well as the shift in the balance of agency from the institution/teacher to the learner through the paradigm of lifelong learning (Cendon 2018). The current global pandemic has only exacerbated the need for teachers and learners to engage productively across hybrid learning spaces, fusing traditionally divergent spaces—home-school, home-work, school-work—into new ones (Cohen, Nørgård & Mor 2020).

Although research attention on self-regulated learning began well before the shift to emergency remote teaching, justification for such research has only been amplified by current hybrid, blended and online modes of HE teaching and learning. Recent research in HE has examined teaching practices that foster student self-regulated learning (Russell et al. 2020), analysing student decision-making in relation to the use of learning strategies across disciplines (García-Pérez, Fraile & Panadero 2021), or as in the case of Panadero et al. (2019), presenting a model on the effects on co-regulation of learning by relating the concept of evaluative judgement to two self-regulated learning models. Facing an abundance of recent evidence, many researchers have conducted systematic reviews in order to synthesize and critically evaluate the literature. Roth, Ogrin and Schmitz (2016) have assessed self-report instruments that measure SRL in higher education, given that they are the most commonly used research instrument, while Anthonysamy, Koo and Hew (2020) examined SRL in HE aiming to understand how to utilise SRL to drive positive non-academic outcomes in blended and digital learning environments. Broadbent and Poon (2015) also examined SLR in online higher education (OHE), concluding that time management, metacognition, effort regulation and critical thinking predicted academic achievement. Despite such recent research, interesting new ideas and approaches to online education outside the usual purview of 'educational psychology' might offer fresh perspectives, insight and promote changes in our understanding of SRL, including ecological, connected and entangled perspectives on lifelong learning from the broader EdTech field.

AIM AND RESEARCH QUESTIONS

The current study aims to examine and expose learning strategies and practices that foster connected forms of learning in online postgraduate education across contexts. Although the fields of EdTech and online higher education have a significant research agenda in both scale and scope, rigorous research and substantive findings about how students experience the balance across a continuum from self-regulated learning to guided instruction have been limited (Blaschke & Marín 2020), particularly from a qualitative perspective or in hybrid or blended contexts. The current study, in response to this identified gap, is guided by the following research questions:

> **RQ1** How do students experience self-regulated, co-regulated or guided learning in online postgraduate education?

> **RQ2** What are the benefits and limitations of peer collaboration as a co-regulated learning strategy in online higher education?

After situating the current research within the existing literature on self-regulated and connected forms of lifelong learning in OHE, qualitative findings from a multi-site, multi-case study are presented. The results section details the core experiences, including learning strategies and practices of students as they engage in an online postgraduate program. The article concludes with a discussion of the implications of connected learning designs and entangled pedagogies for fostering productive self-regulated and co-regulated learning through guided instruction, where educational purpose, values, and context are emphasised over teaching methods and technologies (Fawns 2022).

LITERATURE REVIEW

SRL is a broad umbrella term under which "a considerable number of variables that influence learning (e.g., self-efficacy, volition, cognitive strategies) are studied within a comprehensive and holistic approach" (Panadero 2017: 1). Generally speaking, SRL covers the cognitive, behavioural, motivational, and affective/emotional aspects of learning. A formal definition of self-regulated learning "refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman 2000: 14). It has become one of the most active areas of research in educational psychology, however it is also increasingly attracting attention in the broad and interdisciplinary field of EdTech (Anthonysamy, Koo & Hew 2020; Broadbent & Poon 2015). One consequence of the potential of self-regulated learning for supporting lifelong learners in OHE is that fostering learners' self-regulated learning has become a significant pedagogical goal of many educational programs. This is particularly critical as the paradigm of lifelong learning is at the centre of OHE, where students are re-entering university as lifelong learners with varying learning trajectories (i.e. early/mid/late career), professional backgrounds and levels of readiness.

Several models of self-regulated learning have been developed and reviewed in the literature (Panadero 2017). However Zimmerman's (2000) model of self-regulated learning has influenced research on MOOCs (Tang 2021), and further research has also supported the idea that Zimmerman's model might benefit higher education students more, based on sociocognitive self-regulated learning interventions (Panadero et al. 2019). Zimmerman's model includes a cycle of (a) forethought, (b) performance, and (c) self-reflection, in combination with a range of practices and strategies that students may use to impact learning and achievement, including:

- goal setting
- strategic planning
- intrinsic interest
- goal orientation
- self-instruction
- time management
- help seeking
- cognitive monitoring
- self-evaluation
- self-satisfaction

Panadero et al. (2019), have linked two common self-regulation models (Zimmerman 2000; Winne 1996; Winne & Hadwin 1998) with the concept of evaluative judgement to develop a model of co-regulation via peer and teacher assessment. Their model can be justified based on previous research on co-regulation, mainly the claims that (a) assessment acts to co-regulate learners (Allal 2016; Andrade & Brookhart 2016), (b) all classroom learning is co-regulated, and (c) that self-regulatory processes are the core mechanism of learning (Allal 2016). Given that evaluative judgements through peer-collaboration are a common activity design in the EdTech field in OHE, understanding the features of co-regulation is an essential task for program developers and instructors. Pedagogical implications include an emphasis on the role of instructors in developing student capacity for evaluative judgement (Panadero et al. 2019). Consequently, the current study adopts the following definition of co-regulation:

> Co-regulation is defined as the joint influence on student learning of the learner's processes of self-regulation and of the sources of regulation in the learning environment: namely, the structure of the teaching/learning situations, the teacher's interventions and interactions with students, the interactions between students, the materials, artifacts and tools used for instruction, and—in particular—for assessment (Allal 2016: 263).

Recent attention has been given to self-regulated learning strategies in blended and fully online university environments, showing links between self-regulated learning strategies and academic achievement (Anthonysamy, Koo & Hew 2020), particularly through strategies of time management, metacognition, effort regulation, and critical thinking (Broadbent & Poon 2015). It has been documented that OHE environments require increased pedagogical attention toward learner control, engagement and processes of self-regulated learning (Zhu, Au & Yates 2016), while other studies have reported a positive relationship between self-regulated

learning strategies and non-academic outcomes (Anthonysamy, Koo & Hew 2020; Broadbent & Poon 2015; Cho, Kim & Choi 2017) such as satisfaction and engagement throughout the educational experience.

In a social sciences context, postgraduate activity is largely characterized as knowledge work. The current study uses the work of Ellis and Goodyear (2013) to define a learning strategy as *what the student does to learn* through activity, particularly relevant in the context of OHE. Two broad activity categories have informed learning design in OHE, which can be placed into inquiry-driven and discussion/dialogue driven activities (Ellis & Goodyear 2013) often involving forms of evaluative judgement (self-evaluation or peer evaluation). Although these broad learning approaches have come under critique, most notably from a cognitive load theory perspective (i.e. Kirschner, Sweller & Clark 2006), they are still widely used in the social sciences, particularly at the graduate level. Kirschner, Sweller and Clark (2006) have argued in favour of designs they term guided, teacher-led instruction. They also attack the limitations, or failure, of what they term "constructivist, discovery, problem-based, experiential, and inquiry-based teaching" (2006: 75). Despite such critique, learning approaches through inquiry-based learning, collaboration and interactive discussions and assignments have been central activity design features within HE (Adams-Becker et al. 2017).

Despite increased attention on self-regulated and co-regulated learning and guided instruction in the literature, what has been missing from the debate has been an entangled view of learning which can capture the complexity and uncertainty of learning across a continuum—from self-regulated to guided instruction. Based on dichotomous definitions provided in the literature, it could be reasoned that self-regulated learning is learner-driven, while guided instruction is teacher-driven, and co-regulated learning consists of the complex and entangled influences, relations and contexts which fall in between. Fawns' (2022) recent model of entangled pedagogy can offer insight for moving beyond dichotomous views in the literature, toward a vision "that encapsulates the mutual shaping of technology, teaching methods, purposes, values and context" (p.1). In this view agency is negotiated between teachers, students and other actors and outcomes cannot be determined in advance because they are contingent on complex relations (Fawns 2022). In an aspirational view of an entangled pedagogy – which may support learners in striking a balance along a continuum from self-regulated learning to guided instruction – educational purpose, context, and values are emphasized over teaching methods and educational technologies (Fawns 2022). In this regard, and as Dron (2022) argues, learners are not just users of technologies but are also co-participants in them.

Connected learning is a recent educational approach which has gained attention by linking formal and informal, or academic and non-academic, learning through networked technologies (Ito et al. 2013; Peters, Guitert-Catasús & Romero 2021). Connected learning is characterized as socially embedded and interest-driven learning that is oriented towards educational, economic or political opportunity (Ito et al. 2013).

In order to capture self-regulated and co-regulated learning strategies and practices across a range of contexts, a lifelong learning ecologies analytical framework underpins the current study (Barron 2006; Peters 2019; Peters, Guitert-Catasús & Romero 2021; Peters & Romero 2019). A learning ecology is a broad umbrella term which has arrived in a moment of significant educational transformation, characterized by innovative ways of learning amplified by new technologies. The learning ecologies construct has been developed by building upon a range of interrelated concepts and theories in the social sciences, such as networked learning and connectivism (Peters, Guitert-Catasús & Romero 2021). We build an analytical focus for this study from a widely cited ontological definition of a learning ecology as "the set of contexts found in physical or virtual spaces that provide opportunities for learning. Each context is comprised of a unique configuration of activities, material resources, relationships, and the interactions that emerge from them" (Barron 2006: 195). From this perspective, the entangled roles of (a) situated learner activity and practices, (b) social interactions and (c) material resources are emphasized across individual lifelong learning trajectories.

RESEARCH DESIGN

The current study presents results from the qualitative component of a broader exploratory sequential mixed methods design (Creamer 2018). The qualitative phase of the study helped

to capture the contextual experiences of emergent forms of situated learning in OHE across a continuum from self-regulated learning to guided instruction. A qualitative approach aims to explore the interconnections and complex relations between student experiences of online learning—amplified through educational technologies and digital media—in formal university scenarios and the everyday socialized learning that happens outside the classroom, especially informal workplace learning.

RESEARCH CONTEXT AND SETTING

The current research problem responds to a lack of understanding of how students experience, integrate and connect learning across contexts and out into the wider world, especially into professional practice. Following a multi-case and multi-site study (Stake 2006), we examined three fully online postgraduate programs in education and digital technology, selected as cases of best practice in distinct cultural and geographic regions. Postgraduate programs were selected using a range of criteria, including:

- accessible and open course and program contents
- open educational practices including the use of MOOCs and open web publishing
- emphasis on lifelong learning, part-time study in combination with and reflection on professional practice and workplace learning
- innovative program design and established faculty with strong publication record

Purposeful and criterion sampling were used to select a total of 12 case study participants across three sites at the Open University of Catalonia (4), the University of Edinburgh (4) and the University of Illinois Urbana-Champaign (4). Purposeful sampling was used to select a variety of information-rich cases capable of providing in-depth information on participants' experiences of learning in online HE. Professors working within each program provided help with sampling within each program population. Criteria for selection related to levels of digital competency, academic engagement, maximum variation related to age and professional profile, as well as a willingness to participate in multiple interviews. Participants also need to have a minimum of 1-year experience of study in the postgraduate program. The "bounded" context of each case study was the students' experiences of learning in relation to the postgraduate program. An emphasis, however, was placed on understanding the range of learning strategies and practices students used across a range of contexts, including in their professional lives and everyday, interest-driven learning, which could complement and support their university learning.

DATA COLLECTION PROCEDURES

A combination of qualitative data collection techniques were used, including program documentation, qualitative interviews, and online observation. Data collection initiated with an examination of each program's outward facing digital footprint. We specifically examined program structure, curriculum requirements, and evaluation techniques. Sources of data included program websites, course blogs and Twitter feeds, program handbooks and course guides, as well as publicly accessible virtual learning platforms and any open educational resources associated with educational activities within each program.

Program documentation underwent an initial thematic analysis which led to the development of an interview and observation protocol underpinned by a lifelong learning ecologies perspective. Following a form of activity-centred analysis (i.e., what the student does when engaging in academic tasks and coursework) a learning ecologies framework (Barron 2006; Jackson 2016; Peters 2019) was used as a guiding heuristic to develop analytical categories for both data collection and analysis. This approach aimed to examine the strategies and practices students used to support learning in postgraduate education. Barron's (2006) ontological definition of a learning ecology was adopted for the study, identifying learner activities, material resources, and social relationships as the core components of an individual's learning ecology. In two distinct phases, twenty-four interviews were conducted. The first phase examined professional trajectories, learner intentions as well as how students approached online learning, including the strategies and practices they engaged in throughout a typical week of study in combination with other life responsibilities. Using a researcher as bystander role, online observations were conducted after the initial interview to identify patterns of practice and behaviour across a restricted range of publicly available sites, including Twitter, LinkedIn, or personal websites

and blogs. In order to pose follow up questions and corroborate thematic results from the first interview, such as identified learning strategies and online behaviour, a second interview was conducted.

DATA ANALYSIS PROCEDURES

In order to achieve rigorous data processing, analysis, and thematic development, a thematic network analysis (Attride-Stirling 2001) was conducted. This method was adopted to reach deeper levels of insight, interpretation and inference in combination with a hybrid analytical approach using both data driven (inductive) and theory driven (deductive) forms of thematic development (Fereday & Eimear Muir-Cochrane 2006). For thematic network development, three steps were taken. First, thematic development was structured around the extraction of lowest order premises evident in the text (*basic themes*); secondly, categories of basic themes were grouped together to form *organizing themes*; and thirdly, *global themes* were constructed that synthesize and encapsulate the principle meanings and complexity of the data from the lower order themes. Throughout data analysis triangulation occurred on a variety of levels to ensure credibility and trustworthiness, including (a) data triangulation across the different case participants, program documentation, and observations, (b) methods triangulation, (c) 'member' checking, and (d) researcher triangulation (Twining et al. 2017).

RESULTS

RQ1 How do students experience self-regulated, co-regulated or guided learning in online postgraduate education?

PARTICIPANT PROFILE IN ONLINE POSTGRADUATE EDUCATION

Table 1 presents a comparative summary of anonymized participant profiles based on learner interviews and complemented by online observation data. Learner descriptors are provided, and a synthesis of key online learning strategies are presented, integrating salient features of each learners' experiences according to their personal approach to online learning.

Table 1 Summary of participant profile and key learning strategies.

BALANCING SELF-REGULATED AND CO-REGULATED LEARNING STRATEGIES

LEARNER DESCRIPTOR	KEY DIGITAL LEARNING STRATEGIES/PRACTICES
Matt Driven & disciplined academic	• being highly organized in academic planning using digital tools and disciplined to engage daily on interest-driven research and writing tasks • connecting weekly updates to major works • finding motivation in peer-feedback
Rebecca Engaged & motivated language professional	• staying up-to-date on all weekly tasks by completing reading, writing, posting and responding early in the week. Connecting weekly updates to major works
John Self-sustaining learner:	• meticulous planning and being highly organized with course outputs • acting as mentor to other students, consciously building core academic skills (information literacy)
Olivia Community-driven social learning consultant	• engaging in peer-feedback, course community building and meticulous planning, motivated by deadlines and connects weekly updates to major works and professional interests
Jose Exceptional & critical online learner	• engaging in readings and research early in week, referring to activity rubric, posting work and responding to peers
Lydia Science & robotics driven learner	• closely following activity document, work daily in the evenings to complete tasks, and organize work with checklists and calendars
Emily Early-career motivated bilingual teacher	• following assignment guide carefully, underline key points, search for essential tools, and apply knowledge into digital presentation
Isabel Early-career motivated bilingual teacher	• following assignment guide closely, reading and writing, as well as evaluating and monitoring her own work • continuous planning skills required

(Contd.)

LEARNER DESCRIPTOR	KEY DIGITAL LEARNING STRATEGIES/PRACTICES
Michael Early-career digital influencer in e-learning sector	• beginning each week early by planning, reading, and note taking using digital tool, as well as reading and responding to peer posts
Ashley Late-career & continuously updating academic	• meticulously following course guide and activity rubrics, completing reading lists, finding coherent argument in written summaries, and developing into written assignment • engaging in course forums consistently
Oliver Intrinsically motivated & self-directed learner	• following course guidelines (rules) and reads texts and writes texts, understanding what is asked and following his own research interests
Silvia Immersive learner and global professional	• being disciplined and staying up to date on readings and assignments while being engaged in course forums and course community, sometimes pushing herself outside her comfort zone to contribute

Table 2 outlines a range of learning strategies and practices identified through thematic analysis. The term learning strategy is used in reference to Ellis and Goodyear (2013) who conceptualize a learning strategy in the context of online education as what students do to translate an academic learning task into learning activity. Results reveal that identified strategies fall into categories of guided, co-regulated, and self-regulated strategies. As will be addressed in the discussion, the boundary between different categories of learning strategy can be difficult to disentangle or identify. For instance, staying up to date on course tasks requires a balance between guided learning (i.e., following the prescribed curriculum) and both self-regulated and co-regulated strategies depending on purpose and context.

Table 2 Learning strategies in meeting academic requirements.

LEARNER DETERMINED, BOUNDARY CROSSING ACTIVITIES

	Staying up-to-date on course tasks (course readings, activities and communication with course participants in forums, debates, and chats)
12/12	*"I think the first thing I realized early on, is that I need to stay up to date. So, that would mean a few things, one I need to make sure that I need to do the readings. And I try and do those throughout the week, but it's good to get in, and do at least one, say on a Sunday. I also try to flip the week, so the start of my next week was on a Saturday or Sunday, so I wasn't behind". (Silvia)*
	Note taking, organizing and transforming course materials
12/12	*"I use the endnote app for referencing. I use the Google translator app for the words I don't know. I use Safari to access the university library (digital). I heavily use my basic standard app for reading because I can do highlights. I can do bookmarks, I can do full text searches. I will then use it to write the assignment or to read the texts, highlight passages on my app, whatever, and send it, hand it in. And that's basically what I do". (Oliver)*
	Engaging with and learning from peer knowledge works through peer-review and peer-feedback activities
10/12	*"Without question peer collaboration supported my learning. In many cases, the contribution of my peers with greater knowledge than myself who worked in groups together". (Jose)*
	Student directed course community building: seeking help from peers and social support through forums, debates and course community
10/12	*"In the more informal community that we have, for my immediate peers in our immediate doctoral programs, I feel like we're talking about the things that we want to talk about, as opposed to what the instructor wants to talk about". (Olivia)*
	Time management in organizing weekly course tasks (early in week and throughout course) using digital calendar tool: being motivated by deadlines and course calendar
10/12	*"I have it (course calendar) marked in 17 places, in google calendar, in the study in front of me, I have it (course calendar) marked on the calendar in the living room. And I've got my husband, he has it marked in his calendar as well, in case I miss something". (Lydia)*
	Connecting micro-scale course tasks with macro-scale course tasks (i.e. connecting weekly tasks with final project)
9/12	*"I was kind of doing double duty, I was being more efficient about what I was actually doing. So it wasn't two separate projects, it was one single project. So that's basically how I learned, or conditioned myself to sort of shape all of this to be more efficient about it how I am going about learning". (Matt)*
	Interest driven readings, inquiry and research activities
8/12	*"It's all interest driven, I mean, it definitely relates to the course's topic which is assessment for learning. There's people in the class, that are doing stuff about rubrics, well, that ship has sailed. Thank god the course isn't asking me to go do research on rubrics because, I'm not interested in rubrics anymore, but I am interested in researching social learning analytics, so that's what I'm researching". (Matt)*
	Building Information and data literacy skills relevant for course tasks (i.e. browsing, filtering, curating and managing information/knowledge)
7/12	*"So I've been trying [to] think about how to organize my thoughts, create outlines for the works (assignments). How to actually read an academic article and pick information out of that article? How do I warehouse that, so it's more accessible, so I can use it for knowledge artefacts that I am creating, at work, or in the future dissertation." (Matt)*

(Contd.)

Metacognitive and self-regulation strategies (thinking about your learning while planning, monitoring, and evaluating course work and learner autonomy)
7/12	*"Another piece that I like is how the course has created these activities that activate my metacognition. So I feel like I'm spending a lot of time, thinking about my thinking, or thinking about the activities that I am doing".* (Matt)
Engaging in academic/professional twitter and social network engagement
5/12	*"Twitter I tend to use much more for academic work in that sense. I didn't originally, but I do now. One of the things I'm particularly interested in is the use of the flipped classroom. Let's go and stick flipped classroom in Twitter and see what comes up and I literally just went, follow, follow, follow, follow, follow and I use Twitter in a much more academic way".* (Ashley)
Identifying and building connections and patterns from previous courses to current course
4/12	*I think I've tried to hang on to the information of things that I've learned in the previous modules and not just go, Okay, that's done now. Forget that. Moving on to the next one".* (Ashley)

Table 3 highlights salient learning strategies and practices which have been assessed as non-academic outcomes, falling outside the formal academic assessment structure, yet which can still complement learning within postgraduate programs, including fostering self-regulated learning. A range of complementary self-directed activities were identified. These activities can be categorized as informal and learner determined. Again, one of the biggest challenges of researching boundary crossing learning is identifying where the boundary is, by disentangling academic from non-academic outputs. The themes in this section have been identified as (i) having a non-academic focus and (ii) because of their distance from an assessment structure or in response to a prescribed learning task.

Table 3 Learner determined, self-regulated or co-regulated activities.

RQ2 What are the benefits and limitations of peer collaboration as a co-regulated learning

Using social networks to engage with course themes once formal course has finished
9/12	*"So I'll follow people on Twitter for example, who I know will be posting things that I am interested in."* Matt
Searching for training/employment opportunities online
9/12	*"Yes, I am in a Facebook group in my region, in fact I am in many different Facebook groups to prepare for the public exam".* (Emily)
Self-directed and interest driven inquiry outside of course requirements
9/12	*"I would say that I do spend time on YouTube. I'll look up YouTube video lessons for various guitar songs and guitar techniques. I'll check out various websites and check out YouTube as well for online lessons and I think that ties in (to formal study) because I'm always finding ideas for presentation I'm always thinking about blogging".* (John)
Connecting interest driven media engagement into academic or professional practice
8/12	*"I probably listen to around 10 hours of podcasts per week".* (Michael)
Engaging in interest driven new media production (audio/video production, blogging)
5/12	*"I started a podcast outside work because I heard someone on a podcast say it was quite easy, and I looked up what's the best microphone and how to you get good sound, how do you edit it. So I was always quite self-directed if I'm interested in learning something".* (Michael)

strategy in online higher education?

PEER COLLABORATION AS A CO-REGULATED LEARNING STRATEGY: BENEFITS AND LIMITATIONS

Student-directed community building emerged as a significant co-regulated learning strategy. Results reveal that postgraduate learning communities can be shaped by two broad processes. The first is a process of intentionally designed group and collaborative tasks and projects directly linked to the program assessment structure. Guided tasks rely on using a variety of communication and knowledge exchange platforms (LMS, email, WhatsApp, Hangouts, Messenger, Google Drive, Office 365 etc.) where students interact through prescribed feedback, dialogue and evaluative judgement, including self and peer-assessment, while producing learning artefacts. The second process of course community building occurs through student initiated informal study groups, side chats, and text groups (i.e., Facebook groups or WhatsApp) where doubts are cast and resolved, learners seek help and social support from peers, often discussing difficulties they are facing in meeting the course requirements, sharing work informally in order to give or receive feedback or simply to learn from peers or provide moral support. Students reported both positive and negative experiences with peer collaboration and

social support. Table 4 presents a range of themes related to positive experiences that were reported.

Table 5 presents negative conceptions of learning through peer collaboration. Participants

Building informal side-chats and study groups to support learning activity and course assignments
11/12	*"We'll share assignments. Generally speaking, not everyone feels comfortable with it, and I don't think everyone feels comfortable doing it, but I come from a journalism background, and I have the belief that nothing is ever not going to be improved by having someone else look at it. And to have them give you ideas, so I always share my assignments". (Michael)*

Finding motivation and accountability in program peer group
10/12	*"I think, inherently that (forming social relationships) increases accountability. And I think when you have that increased accountability, that helps the external motivation. I think that's such an important piece of learning is being part of a community that's learning together. I think that that's everything. That's almost what you're paying for". (Matt)*

Connecting with 'like-minded' colleagues through common research and personal interests
9/12	*"Using WhatsApp, we have a lot of groups, by class, and for the master as a whole. We've also been helping each other, resolving doubts or problems. Helping those out who you shared more 'feeling' with, exchanging works in order to see where you are at in comparison". (Lydia)*

Engaging in peer mentoring supports learning and builds sense of community
8/12	*"We all talked about becoming mentors. We all decided that we want to start a mentor program as doctoral students to pass down what we know within the system, and also start creating more video tutorials and more written works that are comprehensive about how to use the CG scholar". (John)*

reported unequal workload between participants, a desire or need for more social collaboration, a lack of continuity in forum participation, as well as being demotivated by lack of peer response to works and critical engagement in forum contributions as factors which negatively impacted co-regulated learning strategies.

Disparity between contribution of participants
7/12	*"Some students are more engaged than others. Some students are more committed, I guess, to the work than others, you can tell". (Rebecca)*

Sense of isolation
6/12	*"Because you feel kind of alone. You're not only physically detached, being among students. But also you feel socially detached because you don't touch it, don't see, you don't meet and this creates a sort of anxiety or hopelessness". (Oliver)*

Online social/academic engagement is linked to assessment structure
5/12	*"I'll be honest, we are just all focused on what we need to get done. And so even though we're collaborating in quotes, by commenting on people's stuff, we are really not collaborating. Again, it's a checkmark situation, and people are just trying to get through things". (Olivia)*

Demotivated by lack of peer response to work
4/12	*"Every student puts an update into the scholar environment, and I feel more motivated when people respond to my updates, so when people don't respond to my updates, then I start to question, hum, is my update not interesting, are people not interested in the same things that I am interested in. I start to reflect on why people aren't responding to this particular update". (Matt)*

Needing more 'expert' and 'impactful' feedback on academic work beyond peer-feedback
4/12	*"I know that the professors have this idea that you don't need an expert to provide feedback. I think that's true, mostly. I think you need a certain level of expertise in order to give meaningful feedback that's going to deepen the learner's learning experience, if someone doesn't know anything about the topic, than there's really not a whole lot that they can give you". (Matt)*

DISCUSSION

This study examined student experiences of lifelong learning in online postgraduate education across contexts, aiming to identify and expose factors which support striking a balance between self-regulated and co-regulated learning and guided instruction. The results reveal learning strategies and practices used to support learning across different contexts, moving between academic and non-academic contexts and self-regulated and co-regulated learning, to provide more nuanced insights into the factors that support or hinder efforts to foster lifelong, self-regulated learning. Three key areas of interest are emphasized to further the dialogue on how to best support lifelong learning in online HE and promote changes in our understanding of self-regulated learning.

SELF-REGULATED LEARNING: LINKING ACADEMIC AND NON-ACADEMIC OUTCOMES

In relation to RQ1, online learning strategies and practices were identified across academic and non-academic contexts. The influence of guided instruction is evident on student activity and learning outcomes when learners respond to explicit tasks linked to assessment. Identified strategies relate to the literature, such as Zimmerman's (2000) model of self-regulation, where results were linked with the forethought phase involving task analysis including identifying goals/objectives and strategic planning (i.e., linking micro-scale with macro-scale tasks) as well as self-motivation, which involves intrinsic interest (Panadero et al. 2019). Other identified strategies in this study related to Winne's (1996) metacognitive view of self-regulated learning, where certain activity designs fostered metacognitive processes and learner autonomy where students are *"spending a lot of time, thinking about my thinking"*. In contrast, those strategies identified with more of an informal focus are characterized as interest driven, and likely part of everyday practices and self-directed routines and lifewide learning (Jackson 2016). Certain strategies identified were connected to lifewide learning contexts, such as professional contexts or networked communities and interest groups, representing features of a connected curriculum (Fung 2017) where student learning in OHE can be brought into a closer, more symbiotic relationship with workplace learning.

EVALUATIVE JUDGEMENT AND COREGULATION

In relation to RQ2, students reported both positive and negative experiences with peer collaboration and social support strategies, which are a central feature of postgraduate education in fully online environments (Adams-Becker et al. 2017; Ellis & Goodyear 2013). There was a clear distinction between strategies used for completing guided, formal tasks which were directly associated with assessment, and those used to foster course community and informal interactions, some of which could be associated with non-academic outcomes (Anthonysamy, Koo & Hew 2020) such as engagement and satisfaction. Peer collaboration in postgraduate contexts often involves evaluative judgements through peer assessment and feedback. Peer assessment, as was revealed in the current study, can have limitations if not structured properly, including a sense of isolation, demotivation and lack of engagement. In order to effectively develop the potential of co-regulation using evaluative judgement, Panadero et al. (2019) highlight the importance of (a) the quality (b) the explicitness and (c) the level of interaction of the feedback information. Moreover, Tai et al. (2017) offer a range of considerations for developing evaluative judgement among students in higher education, including the use of self-assessment, peer assessment, feedback, rubrics and exemplars. These pedagogical processes should continue to be a focus of research attention in OHE to foster self-regulation through peer-collaboration and social support, and could be explicitly communicated as a central value and purpose of OHE in the EdTech field.

BUILDING A CONNECTED CURRICULUM USING AN ENTANGLED PEDAGOGY

Unsurprisingly, the findings revealed that the formal curriculum has a significant influence on students' experiences of self-regulated and co-regulated learning across contexts. As corroborated by claims in the literature; assessment acts to co-regulate learners (Allal 2016; Andrade & Brookhart 2016); all classroom learning is co-regulated, aided by the asynchronicity of virtual classroom, learning management systems and instant messaging, which characterize online postgraduate education; and self-regulatory processes are the core mechanism of learning (Allal 2016).

As was reported, the boundary between self-regulated and co-regulated learning is difficult to discern, and delineating these learning strategies is a challenge for researchers. However a promising approach for fostering a balance between these strategies could be adopting an entangled pedagogy (Fawns 2022). Such an aspirational view emphasizes purpose, context and values over teaching methods and technologies while embracing uncertainty, imperfection, honesty and openness (Fawns 2022), all traits inherent to open educational practices. Making educational purposes explicit, for example, allows learners to know both *what they will do*, and *why*. Clarifying educational values in online learning design can communicate what matters within learning and teaching, including the intrinsic worth of fostering self-regulated and co-regulated learning strategies. As Biesta (2009) articulates, good education has three purposes

or functions, which can often be in tension with each other. Qualification is the first function, preparing students to contribute to economic growth and citizenship through knowledge and skill development; socialization, is a second function of education which prepares students for becoming "members of and part of particular social, cultural and political 'orders'"(p.40); and finally, there is a subjectification function which is in contrast to socialization and prepares students to be autonomous and independent critical thinkers. In the context of postgraduate OHE, acknowledging and making these functions explicit can be productive strategies for fostering self-regulated and co-regulated learning.

Considerations can be made to foster a balance between self-regulated and co-regulated learning in online postgraduate education through intentional connected curriculum designs (Fung 2017) using outward-looking curriculum tasks such as (a) assessments designed with purpose to produce outputs directed at an audience, (b) students connecting with researchers and institutional research, (c) students connecting with each other and others across cohorts, including alumni, (d) students connecting academic learning with professional learning in the workplace. Such connected curriculum designs emphasize context, another feature of an entangled pedagogy, including the personal contexts of learners, their professional and academic trajectories, intentions, studying conditions and so on. Context also acknowledges the broader context of the university, including institutional research and teaching contexts and connections to broader education systems or industry.

Rigorous research on the balance between self-regulated and co-regulated learning across contexts in OHE has been limited. The current study proposes examining and shaping the balance between such processes of learning as a promising focus for program development, including through connected curriculum designs and an entangled view of pedagogy. Although research on self-regulated learning is a considerable area of interest in educational research, interesting new ideas, including theoretical and methodological approaches that are emerging outside the usual purview of 'educational psychology' can drive research in order to offer fresh perspectives, insight and promote changes in our understanding of SRL, including ecological, connected and entangled perspectives on lifelong learning from the fields of EdTech and educational theory.

A pedagogical implication of the study is that learners should be encouraged to develop evaluative judgement as a core purpose and value of online postgraduate education. Through the paradigm of lifelong learning, we know that the joint influences on student learning in this mode of HE vary incredibly, depending on contextual factors such as individual levels of readiness, interest and capabilities as well as the idiosyncrasies of each individual's learning trajectory. Developing and encouraging connected forms of learning, where the sources of regulation come from beyond the traditional boundaries of a university classroom, such as through networked academic activities, communities of practice or by connecting academic learning with workplace learning, could be a productive approach for balancing self-regulated and co-regulated learning, fostering student development and achievement.

It must be acknowledged that every study is limited in some way and therefore limitations need to be recognized here. In terms of methodological limitations, the most obvious is the use of a multiple case study design, noted for its lack of representativeness which may influence issues of reliability, validity and generalizability. Following an exploratory and interpretive paradigm, the research results should not be considered as exhaustive or universally applicable. The population under study refers to graduate students with a broad variation of academic and professional trajectories and may not be generalizable to younger students at the undergraduate level or across disciplinary boundaries.

CONCLUSIONS

As the fields of EdTech and online postgraduate education continue to grow in scale, reach, and significance in the post pandemic 2020's, finding a balance between guidance and self-regulated learning is essential. Efforts in this regard can help advance our understanding of how best to support lifelong learners and their career trajectories across contexts. As a result of this study we have been able to emphasize areas of interest for how to find the balance between guidance and self-regulated learning in online higher education from the

students' perspectives, especially valuable in post-COVID19 settings, such as (a) emphasizing how learners strategically link guided learning strategies with informal strategies achieving both academic and non-academic outcomes, (b) the role of evaluative judgement in peer collaboration as a co-regulation strategy; and (c) the role of an outward-facing connected curriculum in supporting lifelong self-regulated learning across contexts.

Supporting lifelong self-regulated learning has many potential applications in HE research and development. Future research could be conducted across distinct disciplines which emphasize connected curriculums, with a focus on the relationship between academic and non-academic outcomes. Future research could also continue to focus on understanding how a balance between self-regulated, co-regulated and guided learning can be shaped through a connected perspective in online education across disciplinary boundaries from the social sciences, to applied fields in the health sciences or natural sciences.

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The authors have no competing interests to declare.

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