Learner Agency in Adult Foundation-Level Education

Exploring adults' lifelong-learning capacity through the integration of learner agency, language, literacy and numeracy

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Nā āheitanga ā-mātauranga, ko angitū ā-ākonga
Building educational capability for learner success

Ako Aotearoa

This resource is part of a wider Adult Literacy, Numeracy and Cultural Capability (ALNACC) package that includes the following:

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- Capability Building Model
- PLD Modules
- ALN Effective Practice Model
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Foreword

Hāpaitia te ara tika pūmau ai te r angatiratanga mo ngā uri whakatipu Foster the pathway of knowledge and strength, independence and growth for the future generations

Never has the call for the people of Aotearoa to see clearly the pathways to knowledge, strength, independence, and growth been more urgent than today. The recent events surrounding the Covid-19 crisis have reaffirmed the need for our people to have strong lifelong- learning skills, effective language, literacy and numeracy skills, and high levels of agency.

The current situation has highlighted the challenges facing people of all ages, such as the need to adapt to changing social and economic situations, the need to retrain for new jobs or careers, the need to master online learning, the necessity to comprehend and interpret more information than any time in history, and the ability to make sense of, and evaluate, the deluge of numerical information used to describe ongoing events and situations.

Ako Aotearoa's Adult Literacy, Numeracy and Cultural Capability (ALNACC) team seeks to address these challenges. We are advancing our commitment to provide the very best language, literacy, numeracy and cultural competency professional development to the tertiary foundation education workforce. We are doing this by integrating research and experience with fresh thinking, building improvements into our provision, and seeking new ways to meet our stated goals, with a view to develop sector capability and establish parity of achievement for Māori and Pacific peoples.

This thinkpiece comprises one component of Ako Aotearoa's work to improve language, literacy and numeracy provision through our contract with the Tertiary Education Commission to build sector educational capability. It explores integrating learner agency with language, literacy and numeracy provision in order to equip the tertiary sector, organisations, practitioners and learners, for the challenges on the road ahead. By being prepared, we will not only survive, but thrive in changing times.

We acknowledge Dr Damon Whitten for producing this resource. Damon is a specialist provider of professional development to the tertiary sector, focusing on adult literacy and numeracy. He focuses on generating and connecting research to real-world contexts and using the results to develop effective teaching and learning approaches. His goal is to be at the forefront of adult education with the purpose of empowering and reengaging adult learners with their dreams, passions and potentials through numeracy and literacy education.

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Abstract

Preparing adults to be lifelong learners is a key educational priority in many countries as they attempt to meet the demands of radically changing national and global economic, technological, and health environments. Readiness for lifelong learning requires adults to be agentic learners, equipped to enact proactive strategies in the pursuit of self-directed learning goals, self-managing their learning process and using, evaluating and modifying learning strategies.

A review of the research finds that lower-skilled adults, while motivated to succeed, enact little agentic learning behaviours; that foundation-level tertiary organisations do not intentionally develop learner agency; and that traditional New Zealand language, literacy and numeracy (LLN) lessons *may* cultivate non-agentic behaviours. Therefore, there is great potential to improve the outcomes of current LLN provision, increase learner uptake and use of existing resources, and to equip adults with the skills needed to engage in ongoing lifelong learning.

This review of evidence identifies and prioritises key aspects of learner agency that can be integrated into LLN provision and prepares the foundation for a culturally responsive professional learning and development package designed to increase learner agency through three impact areas: the development of learner skills, knowledge and beliefs; the structure and design of organisational support; and the development of educator knowledge, skills and use of resources.

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Introduction: Language, literacy and numeracy, and lifelong learning for all

The 'Learner Agency' project is part of a broader Ako Aotearoa strategy designed to ensure all New Zealand adults have the skills to engage successfully in 'lifelong learning' (Ako Aotearoa, 2019). The strategy is aligned with New Zealand's commitment to the United Nations' fourth Sustainable Development Goal (SDG), 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' (World Education Forum [WEF], 2016, p. 7). Specifically, it supports subgoal 4.6 which emphasises the essential, transformative role of literacy and numeracy in ensuring lifelong learning for all. The goal is ambitious: 'By 2030 all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy' (p. 46).

Despite difficulties defining what 'achieving literacy and numeracy' means, in the New Zealand context this goal relates to all adults having the LLN skills needed to fully participate in, and benefit from, our growing knowledge-based economy (OECD, 2019a). Given this goal, New Zealand's recent results from the Programme for the International Assessment of Adult Competencies (PIAAC) survey indicate an *urgent* need to address LLN, as anywhere from 40% to 50% of the adult population present at levels one and two on a five-level framework (Ministry of Education and Ministry of Business, Innovation and Employment [MoE & MBIE], 2016). These results indicate that substantial numbers of the New Zealand population are unprepared to meet existing and upcoming societal learning demands driven by health crises, and rapid technological, economic and social changes. Furthermore, those presenting at these levels are already at significant risk of lower life outcomes, and there is international consensus that LLN skills are increasingly indispensable for lifelong learning in the modern era (OECD, 2016). Low LLN skills are a real threat to the SDG goals of emancipation, democracy and social cohesion and have a real-life negative impact on individuals and their families (Bynner & Parsons, 2006; Grotlüschen, Mallows, Reder, & Sabatini, 2016), and New Zealand is no exception (MoE & MBIE, 2016a). The need for strong LLN skills has never been more urgent, and the stakes for the future wellbeing of New Zealand have never been higher.

Ako Aotearoa is addressing this issue within its role as a primary New Zealand provider of LLN professional development by enhancing its current provision in order to equip practitioners with the skills needed to meet the changing demands of the 21st century (for example see, Technological Change and the Future of Work, New Zealand Productivity

Commission, 2020). As the environment adults with low LLN skills live and work in changes, LLN provision needs to change also, in terms of developing content, improving how it is delivered, identifying new skill demands, and prioritising valuable skills. We have known for some time that a sole focus on LLN knowledge acquisition and static skill sets is insufficient to equip adults for the modern environment (PIAAC Expert Group in Problem Solving in Technology-Rich Environments, 2009). A growing body of research shows more clearly the skills that future workers will require (Confederation of British Industry [CBI], 2015; Expert Group on Future Skills Needs [EGFSN], 2015; New Zealand Productivity Commission, 2020). These skills include the requirement to *constantly* learn new skills, systems and content, and the ability to solve unique and novel problems never encountered before. This suggests an amalgam of skills: advanced LLN skills, knowing *how to learn*, and knowing *how to solve* novel and challenging problems.

A strong positive factor is that LLN provision overlaps almost perfectly with the goal of developing learning skills and problem-solving skills and there are aspects that can be easily incorporated into existing content that will improve outcomes for adult learners. To give one example, some established LLN activities lead to better outcomes than others. Some literacy activities develop valuable transferable skills, others develop only localised skills, and there are also activities that prepare learners to be more independent. Supporting educators to make these distinctions and to prioritise higher-value learning activities is one way to improve our current LLN provision.

This thinkpiece presents a rationale for the initial phase of an updated, comprehensive, research-informed, LLN professional learning and development package that addresses the concerns raised above. These are the necessary tools to support temporarily low-skilled adults to become lifelong learners and enter into new and exciting life opportunities.

What is lifelong learning?

The lifelong learning perspective recognises that *change* is a defining characteristic of modern society, impacting people's lives, their workplaces and their communities. Rapid and constant changes in technology, demographics, economics and commerce require adults to *continually* learn new skills to remain competitive in the workplace and fully participate in society (Ehlers & Kellermann, 2019; New Zealand Productivity Commission, 2020; UNESCO, 2016). The lifelong learning paradigm does not advance a deficit model of LLN, but rather presents a positive view about how LLN skills contribute to people's voluntary engagement in formal and/or non-formal training, their self-learning and

problem-solving skills, and the positive impact these have on their quality of life, social inclusion, active citizenship and personal development (Commission of the European Communities, 2006).

The ability to engage in continual learning enables individuals to remain highly employable *and* to take advantage of the opportunities to expand human flourishing. On the other hand, individuals who have difficulties continuing to learn, either through lack of access to educational opportunities, low LLN skills, poor self-efficacy or enabling beliefs, or neurodiversity challenges, such as dyslexia, are at an increased likelihood of social, health, economic and participatory inequalities (Hanemann, 2019; OECD, 2015).

The lifelong learning perspective presents a slight step change to the Tertiary Education Commission's approach to LLN provision, which has been primarily concerned with ensuring adults have sufficient LLN skills to complete entry-level qualifications and enter the workforce (Tertiary Education Commission [TEC], 2015). The requirement for adults to *continually* upskill challenges the notion that competencies can be developed at a single point in time because "competency levels acquired at a given moment will become outdated or insufficient" (Hanemann, 2019, p. 259). Raising adults' LLN skills to meet the demands of a qualification and the workplace, although necessary, is no longer sufficient. In addition to developing the LLN skills needed for a specific purpose, the lifelong learning perspective posits that adults must have the skills, knowledge and enabling beliefs to be self-motivated, to voluntarily pursue ongoing knowledge for either personal or professional reasons, and be able to successfully manage their learning (World Education Forum [WEF], 2016). Therefore, adults must have high LLN skills *and* be highly agentic, equipped to pursue, engage, and succeed in new learning over the entire course of their lifespan. Developing lower-skilled adults' LLN skills in conjunction with personal agency is pivotal to preparing adults for the modern environment.

What is agency?

Tangata whenua legends, such as those about Māui, provide rich metaphors to describe individual and collaborative agency in the face of constraining situations or environments. For example, the story of Māui and the sun (Tama-nui-te-rā) begins with a world in which the length of each day is simply too short to complete the work required. Rather than accept this situation as fixed and unchangeable Māui and his brothers make a plan, creatively construct a net using available resources, trap the sun, and negotiate a successful agreement with te rā to move through the sky slower (Wiremu, 2016). An agentic

approach is presented: A problem existed, there was a belief that it could be changed, a plan was made, resources drawn upon, and adaptions made when necessary. This is the essence of human agency.

As seen in the example above, the concept of human agency rests on the foundation that people are able to intentionally influence their own behaviours, which in turn influence outcomes (Bandura, 2006). People are not viewed as *wholly* shaped by their environments, societies, situations or circumstances but are able to comprehend, predict and modify their actions to alter the course of events, override environmental factors, and purposely shape their life outcomes for the better. The realist perspective of agency does not deny or downplay the influence of environmental or historical factors, but views these and personal influence as part of a reciprocal causal structure (Bandura, 2006; Sealey & Carter, 2004). An agentic person, although influenced, and perhaps constrained, by environmental and societal structures still recognises options for actions and has the will and capacity to act in some way (Gao, 2010).

A body of philosophic work describes human agency as an outcome of human consciousness, functionalised by our ability to visualise future states and then construct, evaluate and modify courses of action to achieve desired outcomes (Bandura, 2006; Hempel-Jorgensen, 2015). This process is widely considered to comprise four properties:

1. intentionality (choosing to act)
2. forethought (visualising a desired future and planning)
3. self-reactiveness (managing the process)
4. self-reflection (reflecting and making changes as necessary).

In a LLN learning context, a learner who desires to improve their LLN skills in order to enter a vocation might begin by purposely developing goals, employing proactive learning strategies to achieve their goals, draw on resources, check constantly whether they are making adequate progress and make changes if necessary, and persist through difficulties and set-backs. They will also be more likely to seek support from others if they recognise they are not making sufficient progress. However, many lower-skilled adults still tend not to take advantage of institutional supports when aware of difficulties (Whitten, 2018).

The development of learner agency has a long history in Aotearoa. Agency has a strong connection to Te Tiriti principles, and strong links with the principle of *Rangatiratanga,* the

right to self-determination, autonomy, self-management and sovereignty. This view of agency is reflected in the orange corner of Ako Aotearoa's *Koronga Rautaki Mahitahi Shared Strategic Agenda* (see Figure 1), which seeks to empower individuals and communities, and to improve social, economic, cultural and environmental outcomes, particularly for Māori and Pacific peoples (Ako Aotearoa, 2020). Elements of agency are also consistent with the value of *Whakamanatanga*, empowering others to improve their own world and the world of others for the betterment of all. This emphasis on empowering lower-skilled adult learners is part of a countermeasure to the limited life choices, actions and outcomes many lower-skilled adults experience (Grotlüschen, Buddeberg, Redmer, Ansen, & Dannath, 2019). It is no surprise then that agency also features heavily in the 'socially just' and lifelong learning pedagogical literature, as it works toward equal access for disadvantaged learners so they too can benefit socially and economically from education, and have access to the pleasure and enjoyment of learning, in coming to understand that something is difficult yet worthwhile (Griffiths, 2012; Hempel-Jorgensen, 2015).

Figure 1: The orange corner of the Ako Aotearoa *Koronga Rautaki Mahitahi -Shared Strategic Agenda 2019-2023*

What does agentic learning look like?

The following discussion presents a review of learner agency, what it is, what it is not, and draws out key content areas and lessons that can be used to inform the development of LLN professional development content. These will be collated at the end of the section.

The combined weight of research suggests that agentic learners can do two things. First, they can self-manage their own learning, and second, they can autonomously engage in, and solve, challenging problems. Numerous studies have researched agency in respect to learners' autonomous self-regulated behaviour (Bandura, 2006; Hempel-Jorgensen, 2015; Klemenčič, 2015). The findings indicate that when agentic learners choose to learn, they demonstrate a higher capacity to initiate and regulate their behaviour across several phases of the learning process. They are able to set their own goals, have clear criteria for success, create and self-initiate action plans, select learning strategies, identify and draw on a range of resources (including people), manage their motivation, evaluate their progress, make changes when necessary, and are active participants in their own learning (Ranellucci, Muis, Wang, Duffy, & Franco, 2013; Schunk, 2005).

Agentic learners also demonstrate greater engagement in problem solving. This is important because the future environment will present individuals and communities with an increasing array of novel and unpredictable problems and situations (PIAAC Expert Group in Problem Solving in Technology Rich Environments [PEPSTRE], 2009). The problem-solving research is quick to point out that pre-loading individuals with content knowledge is not sufficient to prepare them for unknowable problems and situations with which they will be faced (Goldin, 2014; Schoenfeld, 2011). While content knowledge is essential, what is also required is enabling beliefs, dispositions, heuristics, skills, and knowledge to tackle novel situations (PIAAC Numeracy Expert Group, 2009; Schoenfeld, 2011). Despite the need for problem-solving skills, a surface review of the foundation-level adult education literature undertaken for this report suggests that problem solving has typically been recommended only as a pedagogical approach within the delivery of adult numeracy provision, not a directly taught skill. Yet, the skill sets and dispositions that make one an agentic learner are analogous to those that make one an agentic problem solver.

Fortunately, the processes of agentic learning, such as setting goals, and planning and monitoring, are very similar to problem-solving approaches. For example, the PIAAC

conceptual framework for problem solving "… specifically assesses goal setting, monitoring, and planning in technology-rich environments" (PEPSTRE, 2009, p. 14). The key difference between self-learning management skills and problem-solving skills appears to lie in the time scope of the problem. Regarding learning, the problem is to identify learning needs, collect resources, plan and implement a structured approach. Regarding problem solving, the problem tends to be narrower in scope, yet still requires the identification of goals and subgoals, the development of a plan and the monitoring of progress. Both require similar configurations of the affective domain, a key element in the foundation-level domain. The overlap between the skill set and dispositional requirements for both learning and problem solving provides an opportunity to synergise a professional development package.

In addition to possessing the skills and knowledge to both manage learning *and* solve problems, agentic learners hold 'enabling belief systems', that is, they believe that they can be successful, that their actions will have an effect on outcomes, and that they can respond proactively to difficulties (Gao, 2010; Safford–Ramus, Misra, & Maguire, 2016). The need for enabling beliefs in the foundation-level domain is heightened because many learners have developed maladaptive beliefs during compulsory education (Hannula et al., 2016; Whitten, 2012, 2018). Whitten (2018) found that New Zealand foundation-level learners' beliefs are typically non-availing and orient learners toward avoiding shame rather than seeking understanding. Finally, agentic learners are more likely to use *active learning strategies* before, during, and after learning events to facilitate learning goals (Schellings, 2011; Van Hout-Wolters, Simons, & Volet, 2000). It is worth noting that developing learners' enabling beliefs, self-management skills, and the use of learning strategies constitute a key performance indicator and expectation within the New Zealand compulsory system (Education Review Office [ERO], 2016). Each of these is reviewed below in the context of foundation-level education.

Students are given explicit instruction in learning strategies (such as goal setting, self-monitoring and deliberate practice) that enable them to take control of their learning, develop meta-cognitive skills, self-regulate, and develop self-efficacy and agency (ERO, 2016, p.33)

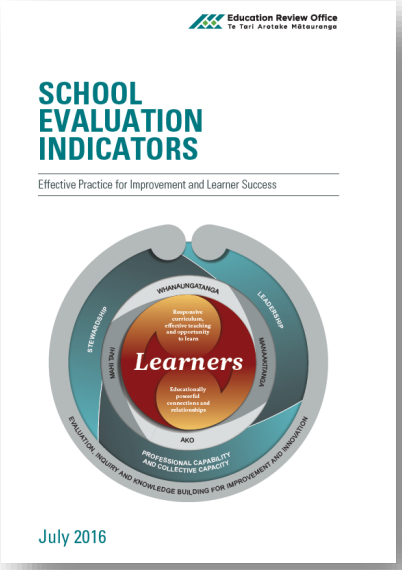

Figure 2: ERO expectations for NZ schools

Enabling beliefs and motivation

A body of research has explored the relationship between learners' beliefs and their behaviours, performance and achievement in educational settings (See Hannula, et al., 2016, for a review). An enduring concept related to agency is self-efficacy, defined by Bandura as "beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments (2006, p.3). Studies demonstrate that learners are more motivated to take action when they have greater self-efficacy beliefs; they demonstrate more persistence, utilise more self-regulation strategies, apply more effort, and are more successful in achieving their goals (Bandura, 2012; Hannula et al., 2016). The causal relationship between self-efficacy beliefs and these factors is not clear. However, most researchers posit a reciprocal relationship between beliefs and performance (Dahl, Bals & Turi, 2005): Positive beliefs increase positive actions, which increase the likelihood of success, and the ensuing achievement enhances self-efficacy beliefs. It is well established that previous academic success develops context-specific self-efficacy while previous failure undermines it (Davis-Kean et al., 2008; Hannula et al., 2016; Klassen & Usher, 2010). In short, to be agentic learners, learners need to *believe* that they can learn, that they can overcome difficulties, and that *their actions* are the primary contributor to success (Hempel-Jorgensen, 2015; Mercer, 2011; Skaalvik & Federici, 2016).

There is also a body of research regarding theories of mind, such as attribution theory, innate and/or growth theory (Dweck, 2016; Weiner, 2010), and epistemological beliefs (Muis, Chevrier, & Singh, 2018). Research indicates important variations in learner behaviour based on the attributions they make about their academic outcomes. Studies

have found that some learners attribute success or failure to factors either within or outside of their control, or to factors that are either fixed or changeable (Chan & Moore, 2006; Weiner, 2010). Non-agentic learners tend to attribute success to external factors, such as good teachers, easy material, or luck, which interfere with the development of positive self-efficacy beliefs. Even more concerning is that non-agentic learners may attribute failure to a personal lack of capability which they believe is innate and unmalleable, and therefore out of their control (Chan & Moore, 2006). This belief pattern has been connected to the onset of learned helplessness in which learners completely abdicate responsibility for learning to others (Allsopp, Kyger, & Lovin, 2007; Hekimoglu & Kittrell, 2010). By contrast, more agentic learners tend to attribute their success to their efforts and their use of strategies, as well as good teachers and resources (Dweck, 2016; Weiner, 2010). Finally, epistemic beliefs about the structure, source and stability of knowledge, how long it takes to learn and whether ability is innate, were found to relate to learners' strategy use, time spent on tasks, academic achievement and motivation (Liu, 2010; Op't Eynde, Corte, & Verschaffel, 2006). A learner's beliefs about what it means to 'learn', be it memorising, applying, or elaborating, also has ramifications for how they approach learning, adopting either a mastery or performance approach (Muis & Duffy, 2013). A useful term for a collection of such negative beliefs is 'non-availing beliefs' (Muis, 2004).

A further factor relating to learner agency is *learner identity* which a range of studies suggests has ramifications for the development of agency, participation and motivation, and emotional responses (Black, Mendick, & Solomon, 2009; Brown, Brown, & Bibby, 2008; Evans, 2000; Grootenboer & Jorgensen, 2009). Social constructivist paradigms posit learning as a process of actualising one's identity through participation (Hannula et al., 2016). However, if a learner has developed a non-learning identity in a specific context (e.g., numeracy) they are likely to adopt passive, non-agentic roles, rather than developing positive patterns of participation within a learning community (Hempel-Jorgensen, 2015; Whitten, 2018). Developing positive learning identities is of greater importance in foundation-level education given that many learners often have poor histories of learning that have shaped their learning identities (Whitten, 2012, 2018). Ensuring LLN instruction cultivates enabling beliefs and proactive identities is essential to developing agentic learners.

Metacognition

Metacognition is a person's own awareness and consideration of his or her thinking processes and strategies, often referred to as 'thinking about thinking' (Flavell, 1979; Perry, Lundie & Golder, 2019). The practice of metacognition by a learner in the context of education includes a range of self-management skills such as setting goals, designing plans, selecting and applying effective learning strategies, monitoring and evaluating progress, and initiating contingency plans if needed. Thus, the competencies associated with metacognition have strong overlaps with similar terms such as 'self-regulated learning', 'learning to learn', 'thinking skills' and even 'twenty-first century skills' (Voogt & Roblin, 2012). For example, Perry et al. (2019) describe metacognition as an overarching term for such competencies and readily admit this makes the term 'fuzzy'. Despite the fuzzy nature of the term, there is strong evidence that when metacognition skills are directly taught to students there is a very positive effect on outcomes (Dignath, Buettner, & Langfeldt, 2008; Hattie, 2009; Perry et al, 2019).

The research domains of both metacognition and agency converge on the importance of learners setting clear learning goals, and position goal setting as a key variable of learner success (Perry et al., 2019). For example, goal setting and planning were found to be the strongest predictors of academic success (Laird, Shoup, Kuh, & Schwarz, 2008). There also seems to be a strong relationship between lower-achieving learners who hold non-availing beliefs and a lack of goal setting. Several studies have found a relationship between negative beliefs and learners' lack of goal setting, leaving learners to simply attempt to meet the demands of the immediate situation (Hadar, 2011; Schommer-Aikins et al., 2005; Whitten, 2018). In such cases, learners were found to adopt a minimal compliance orientation to classroom activities, in which they focused on completing immediate teacher-assigned tasks to the letter, and participating minimally, rather than focusing on learning (Hadar, 2011; Whitten, 2018). Similarly, Schommer-Aikins and Duell (2013) found that lower-skilled students felt that learning was out of their control. Learners reported using disorganised study methods and behaving somewhat aimlessly in their study habits.

A body of research has explored approaches to improve metacognitive function, often within the domain of control or organising strategies, and self-regulation (Duncan & McKaechie, 2005; Neroni et al., 2019). These are typically activities built into online programmes, direct teaching sessions, or structural supports such as issuing learners with

guided workbooks. These have also included activities that facilitate task motivation, online systems to help learners self-monitor their own learning, and processes designed to encourage time management and self-management (Janakiraman, Watson, & Watson, 2018). Other interventions have explored supporting learners to routinely talk with others engaged in the same or higher study (peer learning, contact with others and academic thinking); supporting learners to identify the need for help and then seek help; and direct teaching of learning strategies (discussed below).

There is some research to show that some adult learners have either learned or chosen to cede responsibility for metacognitive processing to educational structures or authorities such as teachers, study planners, or other learners (Whitten, 2018). For example, many non-agentic learners in mathematical contexts expect teachers to provide *all* the structure, including the learning goals, the learning activities, and even prefer the tutor to manage their own classroom behaviour such as talking (Allsopp, Kyger, & Lovin, 2007; Whitten, 2018). By contrast, agentic learners take responsibility for these aspects themselves and demonstrate greater metacognitive awareness (De Corte, Mason, Depaepe, & Verschaffel, 2011). While these learners may use a teacher's knowledge to achieve their goals, they do not cede complete authority to the teacher. The analogy of a 'dance of agency' has been used to describe how a learner may 'dance' between exercising their own agency, and choosing to follow the agency of the teacher or discipline to meet their goals (Grootenboer & Jorgenson, 2009; Pickering, 1995). Whitten (2018), exploring New Zealand foundation-level adult classrooms, unfortunately saw little evidence of agentic learning behaviours, but rather what he coined as a 'dance of dysfunction' in which learners 'danced' between exploiting classroom routines to avoid engagement with content and using other learners to obscure their lack of engagement.

Pickering (1985) describes the interplay of personal agency with the agency of a subject as the 'mangle of practice', a messy but essential practice.

Learning strategies

From a cognitive theory of learning perspective, learning strategies are strategies used to actively process information, link new information to existing knowledge, extend and organise existing memory structures and facilitate storage in long-term memory (Bortoletto & Boruchovitch, 2013). Their use is considered a component of metacognition, under the direction of a goal-oriented learner (Perry et al., 2019). Some learning strategies are considered less effective because they facilitate 'shallow processing' while others, such as elaboration strategies, facilitate deep processing (Hadar, 2011; Muis & Duffy, 2013). Social constructivist views also acknowledge and value the role of personal learning strategies. They view learning strategies that involve social interaction as highly effective learning activities, particularly with a more knowledgeable other, but also view individual learning strategies as techniques that facilitate internal dialogue, leading to 'higher mental functioning' (Dignath et al., 2008; Vygotsky, 1978). Drawing on both traditions, the Adult Learning Progressions (TEC, 2008) promote the use of learning strategies for literacy and numeracy. For example, an overview of reading comprehension strategies (a subset of learning strategies) is available in the Learning Progressions Background Information book and recommended to be used with adult learners (TEC, 2008b, p. 26).

Learning strategies have been broadly categorised as rehearsal, elaboration or control strategies (Ranellucci et al. 2013). Rehearsal strategies are behaviours adopted by learners to help them memorise information for rapid recall at a later point. For example, the practice of learning multiplication facts by repeating them daily or learning to spell words by writing them multiple times. Unfortunately, the use of memorisation strategies is associated with poor performance in mathematics, reading, and science (Chiu, Chow, & Mcbride-Chang, 2007). In fact, in one international numeracy study learners who reported using memorisation strategies to learn mathematics were found to perform *worse* than those who reported using no strategies (OECD, 2016). A commonly cited reason for the poor outcomes of memorisation strategies is that they result in shallow cognitive processing, leading to a lack of transfer, and removing the bootstrapping effect of deep learning. In other words, rote learning "eight sevens are fifty-six" does not help you learn '6 x 8', neither does it facilitate a self-learning cycle (Skemp, 1978). An OECD international study revealed that the promotion of memorisation strategies by New Zealand mathematics teachers was among the highest in the world (OECD, 2016). Given this, it may not be surprising to find that adults who left school early tend to adopt memorisation strategies as their primary learning strategy.

There is little research on foundation-level learners' use of learning strategies. What does exist suggests such learners use no strategies other than those dictated by educators within lessons, and drill memorisation strategies when they engage in private study (Coben et al., 2007; Whitten, 2018). Whitten directly asked learners what strategies they used to learn and what they did when experiencing difficulty. The majority of learners reported using no learning strategies at all in their own study and the few that did used only memorisation strategies, such as the 'copy, cover, check' approach for mathematical formulae. Interestingly, some learners equated 'learning' with writing mathematical formulae into their books, despite not being able to use the formulae without the book, suggesting a limited, and possibly unhealthy, view of learning. Unfortunately, the study suggested that the learners who were highly motivated to study in their own time, tended to use the most ineffective strategies to study. The concern expressed was that these motivated learners may become unmotivated in the face of poor learning outcomes from their extra efforts.

Elaboration strategies are activities that demand more cognitive processing than memorisation, being designed to actively integrate new learning with prior knowledge (Muis & Duffy, 2013). These strategies can be implemented before, during or after exposure with content. For example, before learners engage with content, they can spend time determining what they want to learn and why, mobilise prior knowledge and skills, select learning strategies, and set learning goals. While engaged with the content they can find connections between what they know and the new information, evaluate and mark key information, practise and apply, purposely verbalise conclusions, annotate, or diagram. Afterwards, learners can paraphrase their reading materials into their own words, (in contrast to memorising key points or words from the text), compare and contrast with other content, apply problem-solving approaches to non-routine mathematical problems, summarise or purposely think about transfer possibilities (See van Hout-Wolters et al., 2000 for a comprehensive review). Learners adopting such strategies demonstrate better recall and transfer of their skills to new problems, perform better at problem solving, and enjoy learning more than those who do not use such strategies (Geitz, Joosten-ten Brinke, & Kirschner, 2016; Ranellucci et al., 2013).

In addition to memorisation and elaboration strategies, control strategies are a third category of strategy that heavily impact learner performance (Artelt, Baumert, Julius-McElvany & Peschar, 2003). Control strategies are strategies learners use to orient themselves towards desired learning domains, effective learning materials or events, and

to monitor their learning progress (Magen-Nagar, 2016; Schoenfeld, 2011). For example, learners exercising control strategies are more likely to think about what they need to learn and set goals, self-clarify the content and skills they need to learn, self-check whether they have adequately learned or misunderstood required content, and select and/or modify learning strategies when required.

Problem-solving skills

A further key component of learner agency is the capability to solve novel problems in a variety of contexts. There is a strong critique of algorithmic approaches to problem-solving in which learners are expected to memorise and then mimic taught solution strategies to various problem types (Schoenfeld, 2011). One primary reason for the critique is that future problems will be characterised by 'novelty'. That is, they will not lend themselves to *taught* solution strategies but rather require 'creative problem-solving (PIAAC Expert Group in Problem Solving in Technology Rich Environments [PEGPSTRE], 2009). The PEGPSTRE raises the prospect that the current population will experience a rapid increase in both the frequency and complexity of such problems and yet are largely unprepared to cope with them. The skills required to cope with novel problems are complex and difficult to develop (Ashcraft, 2002). Consequently, there is a general consensus among educators that the purposeful development of problem-solving skills be integrated into all content, be it numeracy (Swain, Baker, Holder, Newmarch & Coben, 2005), literacy or computer skills (Lazonder & Rouet, 2008). Furthermore, it is highly recommended that problem-solving skills be *explicitly* taught for the skills to transfer to a range of contexts (PEGPSTRE, 2009).

During the 20th century there was much attention on the limits and capabilities of human problem solving (Newell & Simon, 1972). The result of various research waves revealed that adults have difficulties solving novel problems due to a predictable matrix of reasons, including functional fixedness, mental sets, and/or the suspension of sense-making (Ashcraft, 2002). These issues are largely due to the influence of prior knowledge, expectations about how problems ought to be solved, and a tendency to avoid novel solution approaches. There is evidence that non-routine problem-solving skills decrease with age (Frey, Mata, & Hertwig, 2015) and New Zealand PIAAC data reveal a sharp decline in technological problem-solving as adults age (MoE & MBIE, 2016c). This is a concern, given New Zealand's aging workforce and increase in technologically driven novel problems (PEGPSTRE, 2009). There are also issues of equity, adults with low or no qualifications

perform significantly less well than those with qualifications, and problem-solving skill differences persist between ethnicities (MOE & MBIE, 2016, 2018).

Although there are frequent calls to develop adults' problem-solving skills the literature shows that few adults are directly taught what to do when they *don't know how* to solve a problem (Burton, 2004; Lakatos, 1976; PEGPSTRE, 2009). This may be partly due to an instructional bias by adult educators toward a transmissional pedagogical approach in which learners are informed how to solve a known problem prior to being presented with it, rather than being presented with a novel problem, being taught a heuristic, and developing their own strategic approaches (Coben et al., 2007; Swan, 2006). There is evidence that a transmissional pedagogical approach permeates the foundation-level education (Benseman, Lander, & Sutton, 2005; Coben et al., 2008; Whitten, 2018). Adults (even teachers) struggle to know what to do when faced with problems that cannot be solved in a routine manner or with an algorithm (Schoenfeld, 2011; Stylianides & Stylianides, 2014). Furthermore, lower-skilled adults may have even greater difficulties due to non-availing or negative beliefs that orient toward avoidance rather than engagement. For example, Whitten's (2018) research found that foundation-level adults responded passively when faced with problems. Rather than engaging with new ideas or ambiguous strategic approaches, the overwhelming majority evaded participation in problem-solving through a number of covert or overt strategies. These behaviours appeared to perpetuate non-agentic approaches and increased the learners' dependence on others.

Learner agency in adult foundation-level education

The section above has set out some key elements of learner agency: metacognitive skills, strategy use, evaluation and contingency planning, and problem-solving skills, each underpinned by enabling beliefs that orient the learner toward action. This section reviews what we know about the agentic or non-agentic behaviours learners enact in adult education settings. Although little direct research exists on adult learner agency, the scant research available indicates three findings. First, that lower-skilled adults utilise less agentic learning behaviours than higher-skilled adults (Grotlüschen et al., 2016; MoE & MBIE, 2017, 2018a, 2018b; Whitten, 2018). Second, agentic learning dispositions are not purposely developed in most adult learning contexts (Coben et al., 2007; Mesa, 2010; Tennant, 2012; Weaver & Qi, 2005; Whitten, 2018). Third, many adult learning environments foster non-agentic learning behaviours (Swain & Swan, 2007; Whitten, 2018).

Evidence that lower-skilled adult learners exercise less agentic learning behaviour is found in the recent Programme of International Assessment of Adult Competencies (PIAAC) data. An international review of the PIAAC data revealed that low-proficiency adults enacted less agentic learning behaviours than those with higher proficiency (Grotlüschen et al., 2016). In New Zealand the Youth, Māori and Pacific PIAAC reports published by the Ministry of Education (2017, 2018a, 2018b, respectively) showed that Māori, Pacific and youth learners (Note: significant proportion of youth are Māori and Pacific) self-reported lower engagement with learning strategies and slightly less self-directed management of learning than higher performing groups. For example, high proportions reported that they were less likely to purposely relate new learning to real-life situations, less likely to relate new learning to things they already know, and expressed less enjoyment getting to the bottom of difficult things. These factors are examples of passive learning, a key characteristic of struggling learners of mathematics in the Universal Features Model (Allsopp, Kyger, & Lovin, 2007), characterised by a non-agentic orientation. Interestingly, both Māori and Pacific learners report *liking* learning more than the non-Māori or non-Pacific population, and Pacific adults reported higher aspirations for participating in learning activities than the non-Pacific population. Furthermore, when Māori and Pacific adults did not understand something, they reported higher rates of looking for additional information. These positive responses suggest that these learners are highly motivated and may simply be unaware of the learning potential of relating new knowledge to situations and existing knowledge, or the learning benefits of persisting through difficult learning experiences.

Secondly, most observational studies of entry-level adult lessons find that the lessons do not cultivate agentic participatory roles (and thus positive learner identity) or foster learner-centered discourse that might promote agency. For example, classroom-based studies reveal an unequal distribution of interaction between the learners themselves, and between the learners and the educator (Bibby, 2002; Howard & Baird, 2000; Howard, James & Taylor, 2002; Mesa, 2010; Tennant, 2012; Weaver & Qi, 2005; Whitten, 2018). The discourse in adult classrooms is almost always initiated and maintained by the tutor, and the majority of interactions that do occur between learners are dominated by a few vocal members in the class (Benseman, Lander, & Sutton, 2005; Howard, James & Taylor, 2002; Scogins & Knell, 2001; Whitten, 2018). Several studies specifically report that adult classrooms lack sustained discussion or debate (Benseman et al., 2005; Mesa, 2010; Ofsted, 2011; Weaver & Qi, 2005). Lesson discourse was found to typically lack complexity, and despite the prolific use of questions by educators, learners' answers to questions were

of a few words or less (Benseman et al. 2005; Whitten, 2018). Typically, adult learners were observed to sit, listen, and follow detailed instructions, never deviating from taught methods (Whitten, 2018).

A lack of agency is also evident from observations of adult group work that occurs within lessons. While tutors frequently initiate group work, the discourse that occurs *between* learners during group work also indicates a lack of learner agency. A number of studies found that despite learners being asked to work collaboratively and sit at the same table, they generally did not do so, preferring to remain silent and let a 'smarter' learner contribute (Swain & Swan, 2007; Whitten, 2018). In many cases a single learner dominated and told the others how to think. Coben et al. (2007) observed that despite ample opportunities for learners to engage with each other there were few examples of learners actually learning from each other. Whitten (2018) noted that learners appeared to cede agentic roles to others to avoid being held responsible for incorrect answers, choosing distinctly non-agentic roles to avoid potentially shameful episodes.

The lack of agentic behaviours by learners within lessons is often levelled at educators' pedagogical approaches, yet several studies find that learners take non-agentic roles themselves, *despite* the efforts of tutors. For example, Coben et al. (2007) found that some tutors worked hard to cultivate interactive learner-to-learner discussions, but reported that the learners continued to work independently and adopt passive roles. These tutors resigned themselves to providing individual work and using transmissional approaches.

Thirdly, there is research to indicate that adult lessons promote and perpetuate non-agentic behaviours by reinforcing the behaviours through feedback loops. Whitten's (2018) observational study of foundation-level embedded LLN lessons revealed that lesson structures provided features for learners to experience pseudo-success. That is, learners were able to complete class tasks without actually learning. The study revealed that learners' framework of success was oriented toward meeting the demands of the class, typically answering questions correctly and avoiding shameful episodes. Learners were able to do both by using the façade of collaborative group work to shield the need to engage and yet also partake in group success. Learners did this by adopting various roles/tasks within groups, such as using the calculator (others dictated the input), reading the problems aloud to the group, or writing answers onto worksheets, but did not engage in solving any problems, leaving this to other 'smarter' group members. By doing so,

learners were able to contribute to group success but showed no signs of the cognitive engagement with content required for learning. The conclusion was that for many learners, foundation-level lessons reinforced and perpetuated the use of strategies designed to avoid and shift the responsibility for completing tasks to others, the very antithesis of LLN instruction designed to support individuals to engage successfully with real-world tasks.

Potential reasons for low learner agency

Several reasons are postulated for why lower-skilled adult learners incline toward non-agentic approaches to learning. The first is that low-skilled learners hold beliefs about how learning occurs, and what a 'good student' is, that leads them to act in non-agentic ways (Whitten, 2012, 2018). Many believe that listening, staying quiet and drilling are positive learning behaviours, while talking, debating, making conjectures and engaging in open-ended problem solving are not conducive to learning (Johnson et al., 2009; Whitten, 2018). They may hold authoritarian epistemological views of learning, that teachers are experts, and therefore receiving information from them is the best way to learn (Hannula et al., 2016).

Another reason why lower-skilled learners are less agentic may be that they simply do not possess the knowledge required to be an agentic learner. For example, the longer a learner is in education the greater their agency (Ministry of Education, 2016b). Learners who are disengaged or have left education early are less likely to have acquired the higher study skills of more advanced learners. Johnson et al. (2009) noted that the reason for poor interaction between adult learners in groups is that the learners *themselves* are resistant to group work, that learners simply see little learning advantage from such activities. The lack of learner engagement in classrooms is not only due to poorly organised activities or tutoring practice, but a consequence of learners' beliefs and subsequent choices about how they engage. The findings also indicate that neither educators nor learners are aware of what constitutes agentic learning (Mercer, 2011, 2012; Whitten, 2018).

Future steps

The above literature review highlights some key areas to address to improve foundation-level learners' agency. Recommendations are made first regarding professional development content and delivery, followed by directions for further research.

Professional development and delivery

The literature review indicates that three domains of educational input are likely to improve foundation-level learners' agency, at least initially.

1. The first is improving learners' affective factors by addressing non-availing beliefs, shame avoidance, and anxiety, as these lead to non-productive learning and problem-solving approaches.
2. The second is to develop learners' understanding of and skill in how to organise and self-manage their own learning process.
3. The third is to provide learners with the tools, skills and experience to unpack and solve problems they have not experienced before.

These three domains are all interconnected and their relationship is reciprocal in nature. A training solution must, at least initially, address these three domains within the context of LLN provision.

1. Develop enabling beliefs and affective responses

Given that a body of research finds that lower-skilled adult learners have developed poor self-concept and negative beliefs about their ability to learn and how learning occurs, and that these beliefs have substantial impacts on achievement, LLN practitioners must be equipped with practical methods of addressing and developing positive beliefs.

The development of a practical guide and clear actions for educators ought to be developed based on relevant research (see Appendix 1). This content should:

- have a remediation orientation (rather than preventative)
- be able to be contextualised to vocational areas
- include initial content such as lesson plans
- include practical approaches that can be integrated into practice across course timelines
- include easy-to-use resources for educators to adapt and apply.

Additionally, content ought to include preparing learners for the learning difficulties they may experience. This content will include an initial session that describes how learning occurs, how negative beliefs and affective responses prevent learning, and equips learners with tools, options, and resources to use when learning difficulties occur. Preparing

learners in advance for any learning difficulties is likely to change how they interpret the experience. Furthermore, providing them with clear actions to take when learning difficulties occur is likely to reduce withdrawal and eventual drop-out.

Note: Content has been developed and integrated into Ako Aotearoa professional learning and development. Additionally, lesson plans and tools, such as learner self-evaluation surveys, have been developed by Ako Aotearoa (See Appendix 2 for an example of a learner self-evaluation tool).

2. Develop self-learning skills

Developing self-learning skills in the context of foundation-level learning means that the development of these skills extends beyond isolated skill development and is instead a process. This means that while the practice of some skills can be embedded into lessons and activities, learners would benefit more from instruction and practice of the entire process. This process includes effective goal setting, planning and resource collection, selection and application of effective strategies, evaluating personal progress, and contingency planning.

Where possible, self-learning practices ought to be embedded into LLN practices. This may include such practices as:

- supporting learners to develop their own learning goals at the beginning of programmes, modules and lessons
- purposely teaching learners how to apply learning strategies and activities, and asking them to select those that most effectively move them towards their goals.
- developing learners' self-evaluation skills, such as "how do you know you are learning what you should?" This might be developed into a self-evaluation that supports learners to ask and answer evaluative questions, such as "how will you know if the activity you used helped you learn?"

Note: The above learning outcomes have been developed into a series of resources that can be used with educators and learners. For example, a draft resource to be included in the teaching resource can be found in Appendix 3.

Additionally, the following learner agency resources are recommended for development to better support the foundation education sector:

- Guidelines for LLN practitioners
- Guidelines for organisations to develop programme infrastructure and resources to develop self-learning skills in conjunction with programme goals
- Guidelines for how digital learning platforms can be designed to encourage self-learning skills.

Note: Guidelines for digital learning platforms have been developed. These are to be written into a handbook and made available online at: https://ako.ac.nz/our-community/ako-aotearoa-news/project-update-exploring-and-developing-adults-lifelong-learning-capacity-through-the-integration-of-agency-literacy-and-numeracy/

3. *Developing problem-solving skills for novel problems*

Given that the future workplace will present workers with new, and, at this time, unpredictable situations and problems, adults need to be able to have the confidence and skills to engage with problems that they have no previous experience with, nor any ready way to solve the problem, and no immediate prospect of success. Thus, the problem-solving approach ought to differ from general problem-solving approaches by not focusing on teaching learners how to solve known problems, such as might occur in a traditional numeracy setting. Rather, it ought to prepare learners with methods to attack new and unknown problem situations, problems for which they do not know the solution strategy. That is, the learner must be prepared to solve problems they have no idea how to solve. The required skill might be best expressed as 'Knowing what to do when you don't know what to do'.

There is a large body of research and prior practice to draw on. One particularly fruitful domain is the mathematical problem-solving literature because it directly addresses preparing learners to attack problems that they have no knowledge of how to solve, no method, algorithm, or technique. A useful approach is the use of a heuristic, or a method of discovering or learning something when no known solution or method is available. Pólya (1954) formalised a time-tested heuristic designed to support mathematics students when no algorithm was available. Drawing on the idea of a problem as a 'task where the solution or goal is not immediately attainable and there is no obvious algorithm for the student to use' (p. 135), Pólya posited four phases of investigation: Coming to understand the problem, developing a plan, enacting the plan, and verifying. This is consistent with a pedagogical approach that treats learners as researchers or explorers, rather than reproducers of

knowledge (Burton, 2004), and is also consistent with adult learning principles (Knowles, Holton & Swanson, 2015).

It is recommended that a heuristic approach be incorporated into LLN provision. The objective is for LLN educators to equip learners with the affective and behavioural skills needed to respond proactively to novel and complex problems, have a clear understanding of how to proceed, overcome inhibiting emotional reactions, and ideally, solve the problems.

Note: The problem-solving approach has been integrated into Ako Aotearoa numeracy professional learning and development and is also available as a stand-alone course (see Appendix 4 for course descriptor). This course was developed and trialled in 2019.

Research recommendations

Given the link between affective factors, lifelong-learning skills, learner agency and problem-solving skills, it is recommended, firstly, that further research is undertaken to explore learners' affective make-up and responses, their knowledge of learning strategies, and the type of strategies learners use when actively learning content.

- Do learners believe they can be agentic?
- Do they report using no learning strategies, as Whitten (2018) found, or report only memorisation strategies?
- Do they attempt to integrate new ideas into their prior knowledge, through elaboration strategies?
- Which learners do apply these strategies, which do not, and how might they be supported to adopt better strategies into their learning repertoires?
- What role might cultural aspects, frameworks and/or practices have in helping learners enhance their agency?

Secondly, it would be beneficial to understand LLN practitioners' beliefs about their learners' potential agentic efficacy, whether they believe learners are capable of being agentic, how these beliefs do, or do not impact their pedagogical approach to developing agency, and their knowledge and promotion of learning strategies.

Thirdly, understanding the options for the exercise of agency within learning events would be beneficial. For example, what type of options for personal variation exist within the lesson activities and educator instructions, and what learning strategies, behaviours and practices are promoted by educators in foundation-level education?

Effective research into the tertiary sector's current development of learner agency needs to take account of several domains and the outcomes of their reciprocal interaction:

- Educator and learner beliefs, skills, and knowledge

- The educational environment, systems, and structure
- Educator and learner behaviours
- Considerations of cultural capital that might be used to develop agency, such as Māori and Pacific peoples' practices.

A research framework that takes account of educators' and learners' personal factors, their behaviours, and environmental factors would provide a lens to view each of these important domains, and clarify how they interact. This would provide valuable insights into distinct aspects of foundation-level education such as how organisations might structure broader systems to promote learner agency, how classroom and lesson structure might enhance or mitigate learner agency, and what skills, knowledge and practices are effective for adult learners to succeed in their current and future training.

Note: A recommended methodology will be available at this link:

https://ako.ac.nz/our-community/ako-aotearoa-news/project-update-exploring-and-developing-adults-lifelong-learning-capacity-through-the-integration-of-agency-literacy-and-numeracy/

A sample of the proposed methodology can also be found in Appendix 5.

Initial professional development packages have been developed by Ako Aotearoa based on the review and recommendations discussed above. These have been trialled and will be integrated into Ako Aotearoa professional development provision and refined. Further documents will be released including instructional video clips, resource books, guidelines, and professional development programmes.

It is Ako Aotearoa's ambition to equip LLN practitioners with the knowledge and skills needed to deliver the highest-quality education to foundation-level learners for the benefit of the people of Aotearoa New Zealand. Integrating strategies for developing and enhancing learner agency in professional development will help achieve this ambition.

References

Ako Aotearoa. (2019). *Koronga Rautaki Mahitahi Shared Strategic Agenda 2019-2023*. Retrieved from https://ako.ac.nz/assets/reports/1e4392c6d9/Ako-Aotearoa-Shared-strategic-agenda.pdf

Ako Aotearoa. (2020). *Our values*. Retrieved from: https://ako.ac.nz/about-us/our-values/

Allsopp, D. H., Kyger, M. M., & Lovin, L. H. (2007). *Teaching mathematics meaningfully: Solutions for reaching struggling learners*. Baltimore, MD: Paul H. Brookes Publishing.

Artelt, C., Baumert, J., Julius-McElvany, N., & Peschar, J. (2003). *Learners for life: Student approaches to learning*. Paris, France: OECD Publishing.

Ashcraft, M. H. (2002). Cognition (3rd ed). New Jersey, NJ. Prentice-Hall Inc.

Ashcraft, M., & Moore, A. (2009). Mathematics anxiety and the affective drop in performance. *Journal of Psychoeducational Assessment, 27*, 197–205.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1*, 164–180.

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited, Editorial. *Journal of Management, 38*, 9-44.

Benseman, J., Lander, J., & Sutton, A. (2005). *Pedagogy in practice: An observational study of literacy, numeracy and language teachers*. Auckland, New Zealand: The University of Auckland & UniServices Ltd.

Bibby, T. (2002). Shame: An emotional response to doing mathematics as an adult and a teacher. *British Educational Research Journal, 28*, 705–721.

Black, L., Mendick, H., & Solomon, Y. (2009). Introduction. In L. Black, H. Mendick, & Y. Solomon, (Eds.), *Mathematical relationships in education: Identities and participation* (pp. 1–4). New York, NY: Taylor & Francis.

Bortoletto, D., & Boruchovitch, E. (2013). Learning strategies and emotional regulation of pedagogy students. *Paidéia (Ribeirão Preto), 23*(55), 235-242.

Brown, M., Brown, P., & Bibby, T. (2008). 'I would rather die': Reasons given by 16–year–olds for not continuing their study of mathematics. *Research in Mathematics Education, 10*, 3–18.

Burton, L. L. (2004). *Mathematicians as enquirers: Learning about learning mathematics*. Dordrecht, The Netherlands: Kluwer Academic Publishers.

Bynner, J., & Parsons, S. (2006) *New light on literacy and numeracy: Results of the literacy and numeracy assessment in the age 34 follow–up of the 1970 British*

Cohort Study (BCS70). London, United Kingdom: National Research and Development Centre for Adult Literacy and Numeracy.

Chan, L. K. S., & Moore, P. J. (2006). Development of Attributional Beliefs and Strategic Knowledge in Years 5–9: A longitudinal analysis. *Educational Psychology, 26*, 161-185.

Chiu, M., Chow, B., & Mcbride-Chang, C. (2007). Universals and specifics in learning strategies: Explaining adolescent mathematics, science, and reading achievement across 34 countries. *Learning and Individual Differences, 17*, 344-365.

Coben, D., Brown, M., Rhodes, V., Swain, J., Ananiadou, K., Brown, P., ... Storey, V. (2007). *Effective teaching and learning: Numeracy*. London: National Research and Development Centre for Adult Literacy and Numeracy.

Commission of the European Communities (2006). *Adult learning: It is never too late to learn*. COM 614 final. Brussels, Author.

Confederation of British Industry. (2015). *Inspiring growth: CBI/Pearson Education and skills survey*. London, United Kingdom: Pearson.

Dahl, T., Bals, M., & Turi, A.L. (2005). Are students' beliefs about knowledge and learning associated with their reported use of learning strategies? *British Journal of Educational Psychology, 75*, 257–273.

Davis-Kean, P., Huesmann, R., Jager, J., Collins, A., Bates, J., & Lansford, J. (2008). Changes in the relation of self-efficacy beliefs and behaviors across development. *Child Development*, 79, 1257–1269.

De Corte, E., Depaepe, F., Op't Eynde, P., & Verschaffel, L. (2011). Students' self-regulation of emotions in mathematics: an analysis of meta-emotional knowledge and skills. *ZDM, 43*, 483.

Dignath, C., Buettner, G., & Langfeldt, H. (2008). How Can Primary School Students Learn Self-Regulated Learning Strategies Most Effectively? *Educational Research Review 3*(2), 101–129.

Duncan, T., & McKeachie, W. (2005). The making of the motivated strategies for learning questionnaire. *Educational Psychologist, 40*, 117-128.

Dweck, C. S. (2016). The remarkable reach of growth mind-sets. *Scientific American Mind, 27*, 36-41.

Echazarra, A., Salinas, D., Méndez, I., Denis, V., Rech., G. (2016). *How teachers teach and students learn: Successful strategies for school*. OECD Education Working Papers, No. 130. Paris: OECD Publishing.

Education Review Office. (2016) *School evaluation indicators: Effective practice for improvement and learner success*. Author.

Ehlers, Ulf. -D., Kellermann, S. (2019). *Future Skills: The future of learning and higher education*. Results of the International Future Skills Delphi Survey. Karlsruhe.

Evans, J. (2000). *Adults' mathematical thinking and emotions: A study of numerate practices*. London, United Kingdom: Routledge/Falmer.

Expert Group on Future Skills Needs. (2015). *The Expert Group on Future Skills Needs Statement of Activity 2014*. Dublin, Ireland: Expert Group on Future Skills Needs, Department of Jobs, Enterprise and Innovation.

Flavell, J. (1979) Metacognition and cognitive monitoring: A new area of cognitive developmental enquiry. *American Psychologist, 34*, 906-911.

Frey, R., Mata, R., & Hertwig, R. (2015). The role of cognitive abilities in decisions from experience: Age differences emerge as a function of choice set size. *Cognition*, *142*, 60-80.

Gao, X. (2010). *Strategic language learning: The roles of agency and context*. Multilingual Matters. Bristol.

Geitz, G., Joosten-ten Brinke, D., & Kirschner, P. (2016). Changing learning behaviour: Self-efficacy and goal orientation in PBL groups in higher education. *International Journal of Educational Research, 75*, 146-158.

Goldin, G. A. (2014). Perspectives on emotion in mathematical engagement, learning, and problem solving. In R. Pekrun & L. Linnenbrink–Garcia (Eds.), *Handbook of emotions in education* (pp. 391–414). New York, NY: Taylor & Francis.

Griffiths, M. (2012). Why Joy in education is an issue for socially just policies. *Journal of Education Policy 27*, 655–670.

Grootenboer, P., & Jorgensen, R. (2009). Towards a theory of identity and agency in coming to learn mathematics. *Eurasia Journal of Mathematics, Science and Technology Education, 5,* 255–266.

Grotlüschen, A., Mallows, D., Reder, S., & Sabatini, J. (2016). Adults with low proficiency in literacy or numeracy. *OECD Education Working Papers, No. 131*. Paris, France: OECD Publishing.

Grotlüschen, A., Buddeberg, K., Redmer, A., Ansen, H., & Dannath, J. (2019). Vulnerable subgroups and numeracy practices: How poverty, debt, and unemployment relate to everyday numeracy practices. *Adult Education Quarterly, 69*, 251-270.

Hadar, L. (2011). Adopting a "satisficing" model for school performance in students' views of learning. *Educational Research and Evaluation, 17*, 193–214.

Hanemann, U. (2019). Examining the application of the lifelong learning principle to the literacy target in the fourth Sustainable Development Goal (SDG 4). *International Review of Education, 65*, 251-275.

Hannula, M., Di Martino, P., Pantziara, M., Zhang, Q., Morselli, F., Heyd-Metzuyanim, E., … Goldin, G. (2016). *Attitudes, beliefs and identity in mathematics education: An overview of the field and future directions*. Cham (ZG), Switzerland: Springer International Publishing.

Hattie, J. (2009). *Visible Learning*. New York, NY. Routledge.

Hekimoglu, S., & Kittrell, E. (2010). Challenging students' beliefs about mathematics: The use of documentary to alter perceptions of efficacy. *PRIMUS, 20*, 299–331.

Hempel-Jorgensen, A. (2015). Learner agency and social justice: what can creative pedagogy contribute to socially just pedagogies? *Pedagogy, Culture & Society, 23*, 531–554.

Howard, J. R., & Baird, R. (2000). The consolidation of responsibility and students' definitions of situation in the mixed-age college classroom. *Journal of Higher Education, 71*, 700–721.

Howard, J.R., James, G.H., & Taylor, D. (2002). The consolidation of responsibility in the mixed-age college classroom. *Teaching Sociology, 30*, 214–234.

Johnson, A., Kimball, R., Melendez, B., Myers, L., Rhea, K., & Travis, B. (2009). Breaking with tradition: Preparing faculty to teach in a student-centered or problem-solving environment. *PRIMUS, 19*, 146–160.

Klassen, R., & Usher, E. (2010). Self-efficacy in educational settings: Resent research and emerging directions. In T. Urdan & S. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 1–34). Bingley, UK: Emerald Group Publishing Limited.

Klemenčič, M. (2015). What is student agency? An ontological exploration in the context of research on student engagement. In M. Klemencic, S. Bergan, & R. Primozic, (Eds.), *Student engagement in Europe: society, higher education and student governance (pp.11-29)*. Council of Europe Higher Education Series No. 20. Strasbourg: Council of Europe Publishing.

Laird, N., Shoup, R., Kuh, G., & Schwarz, M. (2008). The Effects of Discipline on Deep Approaches to Student Learning and College Outcomes. *Research in Higher Education, 49*, 469–494.

Lakatos, I. (1976). *Proofs and refutations: The logic of mathematical discovery*. Cambridge, United Kingdom: Cambridge University Press.

Lazonder, A., & Rouet, J. (2008). Information problem solving instruction: Some cognitive and metacognitive issues. *Computers in Human Behavior, 24*, 753-765.

Liu, P. H. (2010). Are beliefs believable? An investigation of college students' epistemological beliefs and behaviour in mathematics. *Journal of Mathematical Behavior, 29*, 86–98.

New Zealand Productivity Commission. (2019). *New Zealand, technology and productivity. Technological change and the future of work, Draft report 1.* Retrieved: https://www.productivity.govt.nz/assets/Documents/740ce1e715/Draft-report-1_NZ-technology-and-productivity-v4.pdf

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner* (8th ed.). Oxford, U.K.: Elsevier.

Magen-Nagar, N. (2016). The effects of learning strategies on mathematical literacy: A comparison between lower and higher achieving countries. *International Journal of Research in Education and Science,* 2, 306-321.

Ministry of Education. (2017). *Youth skills: Survey of adult skills (PIAAC).* Wellington, New Zealand: Author.

Ministry of Education. (2018a). *Survey of Adult Skills: Māori adults' literacy, numeracy and problem solving skills*. Wellington, New Zealand. Author.

Ministry of Education. (2018b). *Survey of Adult Skills: Pacific adults' literacy, numeracy and problem solving skills*. Wellington, New Zealand. Author.

Ministry of Education and Ministry of Business, Innovation and Employment. (2016a). *Skills at work: Survey of adult skills*. Author.

Ministry of Education and Ministry of Business, Innovation and Employment. (2016b). *Skills and Education: Survey of adult skills*. Wellington, New Zealand: Author.

Ministry of Education and Ministry of Business, Innovation and Employment. (2016c). *Skills in New Zealand and around the world: Survey of adult skills*. Wellington, New Zealand: Author.

Mercer, S. (2011). Understanding learner agency as a complex dynamic system. *System, 39*, 427-436.

Mercer, S. (2012). The complexity of learner agency. *Journal of Applied Language Studies 6*(2), 41-59.

Mesa, V. (2010). Student participation in mathematics lessons taught by seven successful community college instructors. *Adults Learning Mathematics: An International Journal, 5,* 64–88.

Muis, K. R. (2004). Personal epistemologies and mathematics: A critical review and synthesis of research. *Review of Educational Research, 74*, 317–377.

Muis, K., Chevrier, M., & Singh, C. (2018). The role of epistemic emotions in personal epistemology and self-regulated learning. *Educational Psychologist, 53*(3), 165-184.

Muis, K., & Duffy, M. (2013). Epistemic Climate and Epistemic Change: Instruction Designed to Change Students' Beliefs and Learning Strategies and Improve Achievement. *Journal of Educational Psychology, 105*, 213–225.

Neroni, J., Meijs, C., Gijselaers, H., Kirschner,. & de Groot, R. (2019). Learning strategies and academic performance in distance education. *Learning and Individual Differences 73*, 1-7.

Newell, A. & Simon, H.A. (1972). *Human Problem Solving*. Englewood Cliffs, NJ. Prentice Hall.

New Zealand Productivity Commission. (2020). *Technological change and the future of work: Final report*. Available at www.productivity.govt.nz

OECD. (2015). *Education for All 2000-2015: achievements and challenges; EFA global monitoring report, 2015*. UNESCO Publishing, Paris.

OECD. (2016). *Skills Matter: Further Results from the Survey of Adult Skills*. OECD Skills Studies. Paris, France: OECD Publishing.

OECD (2019). Executive Summary in Skills Matter: Additional Results from the Survey of Adult Skills. Paris, France: OECD Publishing.

Office for Standards in Education. (2011). *Tackling the challenge of low numeracy skills in young people and adults* (Reference no. 100225). Manchester, United Kingdom: Author.

Op't Eynde, P., Corte, E. D., & Verschaffel, L. (2006). Accepting emotional complexity: A socio-constructivist perspective on the role of emotions in the mathematics classroom. *Educational Studies in Mathematics, 63*, 193-207.

Pajares, F., & Usher, E. (2008). Self-efficacy, motivation, and achievement in school from the perspective of reciprocal determinism. In M. L. Maehr, S. A. Karabenick & T. C. Urdan (Eds.), *Advances in motivation and achievement: Social psychological perspectives*. (Vol 15, pp. 391- 423). Bingley, United Kingdom: Emerald.

PIAAC Numeracy Expert Group. (2009). *PIAAC numeracy: A conceptual framework. OECD Education Working Papers, No. 35*. Paris, France: OECD Publishing.

PIAAC Expert Group in Problem Solving in Technology-Rich Environments. (2009). *PIAAC Problem Solving in Technology-Rich Environments: A Conceptual Framework*. OECD Education Working Papers, No. 36. Paris, France: OECD Publishing.

Pickering, A. (1995). *The mangle of practice: Time, agency and science*. Chicago, IL: The University of Chicago.

Pólya, G. (1954). *Induction and analogy in mathematics*. Princeton, NJ: Princeton University Press.

Ranellucci, J., Muis, K. R., Wang, X., Duffy, M., & Franco, G. M. (2013). To master or perform? Exploring relations between achievement goals and conceptual change learning. *British Journal of Educational Psychology, 83*, 431-451.

Reusser, K. (2000). Success and failure in school mathematics: Effects of instruction and school environment. *European Child and Adolescent Psychiatry, 9*, 17–26.

Safford-Ramus, K., Misra, P. K., & Maguire, T. (2016). *The troika of adult learners, lifelong learning, and mathematics: Learning from research, current paradoxes, tensions and promotional strategies*. Cham (ZG), Switzerland: Springer International Publishing.

Schellings, G. L. M. (2011). Applying learning strategies questionnaires: Problems and possibilities. *Metacognition and Learning, 6*, 91–109.

Schoenfeld, A. H. (1985). *Mathematical problem solving*. New York, NY: Academic Press.

Schoenfeld, A. H. (2011). *How we think: A theory of goal-oriented decision making and its educational applications*. New York, NY: Routledge.

Schommer-Aikins, M., & Duell, O. K. (2013). Domain specific and general epistemological beliefs and their effects on mathematics. *Revista de Investigación Educativa, 31*, 317–330.

Schunk, D. H. (2005). Self-regulated learning: The educational legacy of Paul R. Pintrich. *Educational Psychologist, 40*(2), 85–94.

Scogins, J., & Knell, S. (2001). *Observations in adult education classrooms: What is really going on?* Champaign, IL: Illinois Literacy Resource Development Centre.

Sealey, A., & Carter, B. (2004). *Applied Linguistics as Social Science*. Continuum, London.

Skaalvik, E., & Federici, R. (2016). Relations between classroom goal structures and students' goal orientations in mathematics classes: When is a mastery goal structure adaptive? *Social Psychology of Education, 19*, 135-150.

Skemp, R. R. (1978). Relational understanding and instrumental understanding. *Arithmetic Teacher 26*(3), 9–15.

Stylianides, A. J., & Stylianides, G. J. (2014). Impacting positively on students' mathematical problem-solving beliefs: An instructional intervention of short duration. *Journal of Mathematical Behavior 33*, 8–29.

Swain, J., Baker, E., Holder, D., Newmarch, B. & Coben, D. (2005). *'Beyond the daily application': Making numeracy teaching meaningful to adult learners*. London, United Kingdom: National Research and Development Centre for Adult Literacy and Numeracy.

Swain, J., & Swan, M. (2007). *Thinking through mathematics: Research report*. London, United Kingdom: National Research and Development Centre for Adult Literacy and Numeracy.

Swan, M. (2006). Designing and using research instruments to describe the beliefs and practices of mathematics teachers. *Research in Education, 75*, 58-70.

Tennant, A. (2012). Adult students' learning behaviours in the college mathematics classroom. *Adults Learning Mathematics: An International Journal, 7*, 23–38.

Tertiary Education Commission. (2008). *Learning progressions for adult literacy*. Wellington, New Zealand: Author.

Tertiary Education Commission. (2008b). *Learning progressions for adult literacy and numeracy: Background information*. Wellington, New Zealand: Author.

Tertiary Education Commission. (2014). *Tertiary education strategy 2014–2019*. Wellington, New Zealand: Ministry of Education and MBIE.

Tertiary Education Commission. (2015*). Literacy and numeracy implementation strategy 2015 - 2019*. Wellington: Author.

UNESCO. (2016). *Education for people and planet: creating sustainable futures for all, Global education monitoring report, 2016*. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000245752

van Hout-Wolters, B., Simons, R., & Volet, S. (2000). Active learning: Self-directed learning and independent work. In P.R.J. Simons, J.L. van der Linden and T. Duffy (Eds.). (2000). *New Learning*. Dordrecht: Kluwer Academic Publishers (p. 21-37).

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st centruy competencies: Implications for national curriculum policies. *Journal of Curriculum Studies 44,* 299–321.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Weaver, R. R., & Qi, J. (2005). Classroom organization and participation: College students' perceptions. *Journal of Higher Education, 76*, 570–601.

Weiner, B. (2010). The development of an attribution-based theory of motivation: A history of ideas. *Educational Psychologist, 45*, 28-36.

Wiremu, G. (2016). *Māui and the giant fish*. Te Kete Ipurangi. Te Tāhuhu o te Mātauranga. Retrieved from http://eng.mataurangamaori.tki.org.nz/Support-materials/Te-Reo-Maori/Maori-Myths-Legends-and-Contemporary-Stories/Maui-and-the-giant-fish

Whitten, D. R. (2012). Divergent learner pathways: Exploring the mathematical beliefs of young adult learners. In A. Hector-Mason & D. Coben., (Eds.), *Synergy: Working together to achieve more than the sum of the parts*. Proceedings of the 19th International Conference of Adults learning Mathematics – A Research Forum (pp.209 - 219). Auckland, New Zealand. The National Centre of Literacy and Numeracy for Adults.

Whitten, D. R. (2018). *Understanding the beliefs and behaviours of low-skilled adults as they re-engage with mathematics*. Doctoral dissertation, The University of Waikato. Hamilton, New Zealand.

World Education Forum. (2016). *Incheon declaration and Framework for action for the implementation of Sustainable Development Goal 4. Towards inclusive and equitable quality education and lifelong learning opportunities for all. Education 2030*. Paris: UNESCO. Retrieved from http://unesd oc.unesco.org/image s/0024/00245 6/24565 6e.pdf.

Appendix 1: Sample of draft curriculum for professional development session with tutors

This is a sample draft document designed to initiate feedback and undergo multiple iterations. Primary objectives are to 'embed' the promotion of agentic learning skills into organisational structures, educator practice, and learner behaviour. The five sessions could be delivered in a blended format.

Session 1	Understand the rationale for emphasising lifelong learning skills • The changing nature of work • Requirement to continually learn • Requirement to engage with, and solve novel problems • Learner agency as a response to learning to learn and problem solving • Discussion – ramifications for your own organisation
Session 2	Understand the connection between language, literacy and numeracy, agency, and lifelong learning • Recognise the overlap between elaboration strategies and literacy and numeracy strategies • Recognise linked nature of reading comprehension strategies and learning strategies • Link between acting like a mathematician (solving novel problems) and learning numeracy – working with the unknown • Discussion – ramifications for your own organisation
Session 3	Goal setting and evaluation • Understand why learners must set goals • Identify the differences between mastery and performance goals • Mastery-oriented standards for success • Writing good learning goals • Review organisational approaches to learner goal setting • Incorporate learner-supported goal setting into programme
Session 4	Integrate modelling of LLN strategies into practice • Discuss the idea of learners as explorers • How adult learners come to learn and use strategies (modelling, implementation, evaluation and refinement) • Prioritising transferable strategies (i.e., how to use text rather than questions based on text) • Model and teach reading strategies • Model and teach problem-solving Note: reading strategies include before, during and after strategies
Session 5	Numeracy development: "Knowing what to do when you don't know what to do" • Strategies to develop a deep understanding of the problem • How to develop a planned strategy • Enacting the plan • Evaluating, checking and reworking

Appendix 2: Problem-solving self-evaluation chart

This form is designed to be used by learners following a problem-solving session. Learners complete multiple forms over time and become conscious of behaviours due to recording them. Changes may fluctuate in the short term, but over time positive progress becomes clear. A full rationale and instructions can be found in Ako Aotearoa numeracy and agency workshops.

Problem-solving self-evaluation progress chart

Problem number one

Name of problem:	Low High
How much effort did I put into understanding the problem?	1 2 3 4 5 6 7 8 9 10
How far did my understanding of the problem grow while I was working on it?	1 2 3 4 5 6 7 8 9 10
How fully did I share my thinking with other people?	1 2 3 4 5 6 7 8 9 10
Did I have a moment when I suddenly understood something?	1 2 3 4 5 6 7 8 9 10
How useful were my drawings?	1 2 3 4 5 6 7 8 9 10
How well did I manage negative thoughts, such as, 'I can't solve this'?	1 2 3 4 5 6 7 8 9 10
How long did I keep going before I gave up?	1 2 3 4 5 6 7 8 9 10
Total score	

Appendix 3: Characteristics of agentic learners

Appendix 4: Agency and problem-solving professional development package

Sharpening the mind: Integrating problem-solving with literacy and numeracy

Developing strong literacy and numeracy skills remains the best way to prepare adults for the changing demands of the workplace. However, recent research suggests that problem-solving skills should also be integrated into LLN provision. Rapid economic, technological and demographic changes are presenting modern workers with new sets of problems and situations they have never seen before. Traditional LLN provision prepares learners to address 'known' problems, but struggles to prepare learners to solve problems they will be completely unfamiliar with. The question is 'how do we support learners to know what to do, when they don't know what to do?'

This workshop shows how problem-solving approaches can be integrated into LLN provision to prepare adults to fully use their LLN skills to solve problems. It is a fun way to develop your design and delivery of problem-solving provision in the context of LLN.

Workshop content includes:

- understanding and addressing learner anxiety and non-engagement
- implementing a problem-solving model
- using literacy and numeracy as thinking tools
- tools, tricks, hints and ideas for spicing up your practice.

Video clip: https://www.youtube.com/watch?v=K5__hrHH82M

Appendix 5: Sample component of proposed methodology

Effective research into the tertiary sector's current development of learner agency needs to take account of several domains and the outcomes of their reciprocal interaction:

- Educator and learner beliefs, skills, and knowledge
- The educational environment, systems and structure
- Educator and learner behaviours.

The triadic reciprocal determinism model (TRD) describes human functioning as a product of continuous reciprocal interaction between intrapersonal, behavioural and environmental determinants. The model will be used as an organising framework to explore agency across the interacting domains: personal, behavioural, and environmental (see Figure 3). Factors that constrain or enhance learner agency can be identified in the first instance and the reciprocal interaction between them analysed in the second. Initiatives to enhance learner agency can then be designed in accordance with each domain cognisant of their reciprocal impact.

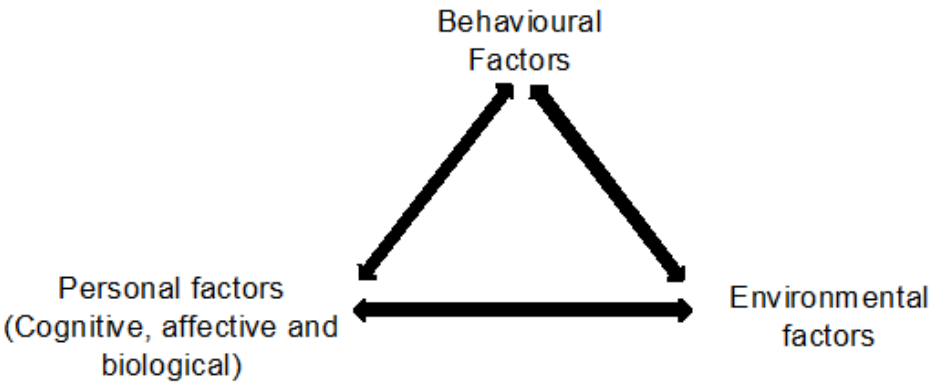

Figure 3: Triadic reciprocal determinism model

Personal factors

Personal factors include biological, cognitive and affective factors. Cognitive aspects include knowledge of goal setting, standards for success, learning strategies for various learning domains, resources, and contingencies when learning is not occurring.

Affective aspects include beliefs about self-efficacy and the relationship with aspirations and achievement, anticipated outcomes of various behaviours, self-appraisal of capability, resilience to difficulties and other affective responses such as anxiety (Bandura, 2006;

Pajares & Usher, 2008). There is substantial research support that beliefs influence the meanings ascribed to events and environments and the affective responses to events; desired outcomes, goals, and actions; anticipated outcomes of various behaviours; how outcome states are internally represented or visualised; and how information is organised for future use (Bandura, 2006, 2012; Pajares & Usher, 2008). Biological factors relate to physical characteristics such as height, strength, and the senses.

Therefore, initial phases of the study will explore what knowledge learner and educators possess about agentic learning behaviours, the learning benefits, and specifically, what is their knowledge of metacognitive, cognitive and regulatory behaviours?

What are learners' expectancy beliefs, and self-efficacy beliefs for agentic learning behaviours?

- What do tutors believe about the value of cultivating agentic learning behaviour?
- What do tutors know about the benefits of agentic learning for learners?
- What do tutors believe are useful ways to cultivate agentic behaviours?
- How do these findings relate to and interact with behavioural and environmental factors?

Behavioural factors include self-regulating strategies, class participation, and discourse patterns. How learners use learning strategies, organisational and personal resources, other people, how they monitor progress, and the actions they take to make changes.

Environmental factors include cultural, contextual, social and physical features. A broad range of factors are influential, for example, cultural practices, programme curriculum, lesson structures, classroom grouping practices, and how learning environments are physically arranged. Other people involved in interpersonal transactions are also considered part of the environment. These individuals, (co-learners and educators) bring with them their own unique personal factors, beliefs, agentic dispositions and behavioural tendencies which exert influence on others. The interactions and relationships between people may settle into specific roles, identities they adopt in specific environments. The social systems generated from social transactions organise, guide, and regulate societal prescriptions and sanctions, which in turn influence further behaviour. Despite social prescriptions and sanctions there is considerable personal variation in how individuals interpret and respond to social rules (Bandura, 2006).

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