INSTITUTE FOR ADULT LEARNING SINGAPORE

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Understanding Adult Learners' Sense-making to Inform Pedagogical Innovations in Blended Learning (BL)

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Executive Summary

Sense-making, understood as meaning-making or giving meaning to experience, is an integral part of everyday life and work. It is a process critical in enabling people to recognise how and when to respond to situations appropriately so that they can resolve problems effectively (Weick, Sutcliffe & Obstfeld, 2005). Understanding how learners sense-make can contribute to better learning design and support in and across different learning environments that will likely contribute to individual 'mastery' of professional expertise. Our interest in sense-making in blended learning (BL) (i.e. learning that takes place across multiple settings including classroom, tech-enabled and workplace (IAL, 2016)) is about how learners experience learning that is intended to increase their capability to act differently in their environment, be it in educational, technology-enabled and/or work settings, as well as how they translate their learning in and across different environments and what the pedagogical implications for such learning are.

This research study captures in ethnographic detail the experiences of learners and educators as they experience, design and facilitate BL in the context of Continuing Education and Training (CET) in Singapore. As with any sector, the CET sector, constituting accreditation bodies, training providers, Institutes for Higher Learning (IHLs), educators and support staff, and most importantly their learners, is riddled with historical artefacts, discourses and (mis)understandings that mediate practices and thus learners' experience of learning as they go through the courses. However, it is not clear to us how these different stakeholders in the system of BL design and delivery are related to and affect one another and impact the quality of adult learners' sense-making experience in BL.

The findings from the comparison of six case studies of BL in this study suggest that to enable seamless and highest quality of sense-making in BL, strong partnerships between the government, training providers and industry partners are necessary in the curriculum development and pedagogical approaches adopted in BL. In this study, delivering BL that include workplace learning, the collaboration between training providers and industry partners, adult educators, curriculum designers and workplace supervisors, emerges as a crucial factor to provide higher quality of sense-making for the adult learners. The key findings are as follows:

1. Learners' sense-making is enhanced when curriculum design and enactment relies on authentic tasks and experiences, providing holistic, systemic understanding of professional/vocational knowledge and practices;

2. Sandwiching practicums, placements, work experience, etc. (i.e. work-based learning) ideally in multiple layers not only enhances sense-making, but also provides a seamless learning journey across different learning environments;

3. Perceptions of system requirements lead training providers (curriculum designers) to continue to use curriculum based on outdated competencies, despite their educators having currency in industry practices;

4. Training providers may not be ready for tech-enabled learning in terms of their technology infrastructure and expertise. Additionally, minimal attention is paid to addressing learners' digital literacy; and

5. There needs to be established and trust-based relations between adult educators and workplace supervisors to enhance feedback to each other on the progress of learners in order to better facilitate their transition across different learning settings.

All these factors are important in contributing to learners making a seamless translation of learning in and across BL environments. The following are some key suggestions to help stakeholders leverage the findings of the research to improve adult learners' sense-making experience:

1. Training providers may need to rethink the purpose of BL. Through working with industry partners and holding ongoing and continuous conversations, training providers may strengthen the design of authentic learning tasks in BL to prepare the learners for the constantly changing needs of industries, and to help them gain a holistic, systemic understanding of professional/vocational knowledge and practices to enable a smooth transition for them from classrooms to workplaces. To make it happen, a few steps may need to be taken:

    a. Curriculum designers may need to design BL by sandwiching authentic learning tasks into the curriculum so that learners' sense-making can be more seamless in and across different BL environments;

    Training providers may need to assess learners' digital literacy and build in the development of digital literacy capabilities; and

    b. Adult educators and workplace supervisors may need to work together closely to follow up on learners' progress or learning challenges to offer timely guidance and facilitation in both classrooms and workplaces.

2. Employers, the demand side of adult learners, play a crucial role in identifying training for these learners in order to meet the constantly changing needs of the industry sector. For the design of authentic tasks, the employers may consider playing a more active role in working with training providers to provide the most

authentic workplace settings and workplace guidance and support to enable seamless sense-making for adult learners;

3. Accreditation bodies of BL courses play an important role in ensuring the quality of BL. Quality assurance processes should include attention to the partnership between training providers and employers; specifically, how they work together to enhance the authenticity and relevance of BL to workplace practices; and

4. All players in the Training and Adult Education (TAE) system have a responsibility to ensure their course content and practices are up-to-date and prepare learners for the future. Flexibility is required to provide space for adjustments to the curriculum to ensure currency.

1. Introduction

Sense-making is a process critical in enabling people to recognise how and when to respond to situations appropriately so that they can resolve problems effectively (Weick, Sutcliffe & Obstfeld, 2005). As such, sense-making is an essential part of work and a critical part of learning because problem solving is ubiquitous in work and learning. Blended learning, particularly with the component of workplace learning, aims to strengthen learners' capability of practical problem solving in a wide variety of settings, ranging from classrooms to workplaces. Thus, the understanding of adult learners' sense-making in BL emerges as an important topic worthy of investigation. Our interest in sense-making in BL (classroom, tech-enabled and work settings, IAL, 2016) is about how such BL, which is intended to raise learners' capability and work performance, is experienced by learners, how these learners translate their learning in and across different environments that enable them to better perform, and what the pedagogical implications are.

Drawing on adult learners' sense-making experiences in different BL courses, this study not only contributes to improving the design of learning in blended environments through hearing learners' voices from four different industry sectors (ICT, healthcare, WSH and HR management), but also importantly, highlights the practice implications for different stakeholders. Through ethnographic detail, this study captures the different kinds of quality of sense-making experiences of learners. These findings can inform stakeholders (training providers, industry partners, adult educators and curriculum designers of BL courses) how they can collaborate to design and facilitate BL in the context of Continuing Education and Training (CET) in Singapore, to enable the high quality of sense-making for adult learners, in order to transit across different learning settings to make the most relevant application.

1.1 Why a study on sense-making in blended learning?

Sense-making enables learners to take action appropriate for their settings. As Engeström notes, we need to learn for what has not yet been created and for what is being created: "In important transformations of our personal lives and organisational practices, we must learn new forms of activity which are not yet there. They are literally learned as they are being created" (Engeström, 2001, p. 138). Sense-making in these circumstances happens naturally. The better we understand how learners sense-make in their preparation and further development for, in and through work, the better their future work and life can be supported. Understanding how learners sense-make can contribute to better learning design and support in and across the different learning environments, which will likely contribute to individual "mastery" of professional expertise.

In the Singapore context, this study is timely, given the policy agenda to move workforce development out of what has historically been a predominantly classroom-based delivery (Bound & Lin, 2011) to recognising and valuing workplace learning and using technology as an enabler for learning in and across classroom and work environments, or what is also referred to in the literature as "spaces" (Bound, Chia & Lee, 2018; Evans & Kersch, 2016). In Singapore, BL is identified as a forward-looking driver to meet the needs of CET (IAL, 2016). This initiative emphasises the importance of promoting BL to CET learners and buyers

(iN.LEARN 2020[1], 2019) as a way to enhance their access to learning and meet their dynamic learning needs.

Another reason for undertaking this study is that the plethora of literature on sense-making offers little insight into learners' sense-making in and across BL environments. Other relevant literature informs us how adults learn at and through work (Billett, 2001a; Boud & Molloy, 2013b; Bound, 2010; Bound & Lin, 2011; Fenwick, 2008a; Lantolf & Beckett, 2009; Nicolini, 2012; Wells, 2000). For example, observation, asking questions, talking about and solving problems with others, feedback, dialogue, inquiry and being reflexive are commonly used learning strategies. In online learning environments, we know that the opportunities the technology offers for collaborative sharing of documents, building communities of practice, co-construction of knowledge, practising skills, and so on, offer potentially rich learning opportunities. What we know considerably less about is how learners make sense of and translate their learning in and across these different settings.

In summary, undertaking a study on learners' sense-making in BL environments contributes to our understanding of how pedagogical practices are mediated in situated settings and discourses, in which adult educators and training providers develop and deliver their learning programmes. These insights will contribute to improving design and delivery of learning in and across blended environments and inform policies that seek to ensure quality learning outcomes.

Specifically, this study will investigate the following three research questions:

RQ1: How do adult learners make sense of and translate their learning across different blended environments and apply to their work?

RQ2: How do adult learners experience learning in and across different blended environments?

RQ3: What are the implications of the findings from RQ1 and RQ2 for pedagogical innovations in BL?

1.2 Definitions

As indicated above, BL in this study is more than classroom and online learning; it also includes learning in work settings. The authors take their definition of BL from the IAL publication *Blending Classroom with Work and Technology: How to Design a Blended Curriculum* (2016). Blended learning is any combination of the following:

- Classroom learning: face-to-face learning that takes place in a protected space and time;
- Work-based learning: learning that is driven by an educational institution (e.g. internship) or Workforce Skills Qualification (WSQ) CET centres towards the attainment of a qualification that is work/occupation-centric;

[1] http://www.skillsfuture.sg/inlearn

- Workplace learning: learning that is driven by an organisation (e.g. workplace supervisors) or individuals, and that is embedded in daily work practices in work settings; and
- Technology-enabled learning: learning that uses technology to support the learning process (IAL, 2016, p. 10).

1.3 Methodology and data sampling

This study has drawn on different qualitative approaches to study adult learners' sense-making experiences in BL environments; namely, phenomenology and semi-ethnography. A phenomenological approach provides rich descriptive data capturing the phenomena of learners' sense-making experiences. A semi-ethnographic approach provides an interpretive lens moving beyond the rich description and themes identified from the phenomenological data collection and analysis, allowing an analysis of enablers and constraints on learners' sense-making.

The unit of analysis is learners' sense-making experiences in and across BL environments. The researchers worked with six training providers delivering BL programme(s) to identify six BL courses that met the sampling criteria, across four industry sectors (ICT, healthcare, WSH and HR management). The training providers from these industry sectors include both educational institutions and companies that provide in-house training for their own workers. The different types of training providers in the present study are able to provide us a rich picture of how different mediators in BL influence adult learners' collective sense-making experiences, which an ethnographic study aims to capture. Therefore, this study is not going to focus on individuals' sense-making from a cognitive or biographical perspective but their collective sense-making in the different learning environments, e.g. classrooms, online spaces and workplaces. The data collected includes both observations and narratives from different people in this process (learners, adult educators and workplace supervisors) to triangulate with one another on the different sense-making experiences of these learners.

The integral role these industry sectors play in supporting the economic and social well-being for Singaporeans can be observed in many ways. For example, the Information and Communications Technology (ICT) industry in Singapore is one which is key to Singapore's economic progress and well-being. Singapore is considered the digital capital of Asia and is the preferred base for ICT firms. It offers world-class infrastructure, talent and a vibrant ecosystem of partners to develop cutting-edge technologies and solutions to support Singapore's Smart Nation vision. Singapore's maritime industry is another key part of the nation's economy, contributing 7% to Singapore's Gross Domestic Product (GDP) and employing over 170 000 people. Maritime Singapore represents the entire ecosystem of the maritime industry and is home to more than 5 000 maritime organisations and businesses. Besides these industries, one other crucial industry sector in Singapore is the healthcare industry. The country continues to face an ageing population, rising chronic disease prevalence, escalating healthcare costs and increasing complexity of care needs, resulting in a rapidly changing healthcare landscape. These trends call for an ever increasing high-quality care sector and strengthening of the nation's overall healthcare ecosystem. It is also noted that BL in the training of these industry sectors has a long tradition. Therefore, it is important to understand how effectively BL in these industry sectors helps the workforce develop the required expertise.

Blended learning courses were identified in each industry sector using the following criteria:

- A mix of WSQ and non-WSQ courses
- A mix of different types of BL courses across industry sectors.

Within each identified course, three to four individual learners and their learning in and across the blended environments were the focus of data collection. While we sought to ensure a range of age, background and gender, this was not always possible to achieve, as we were reliant on consent from participants. Semi-ethnographic approaches – semi-structured interviews, observations, asking participants to take photographs, and analysis of relevant documents (e.g. curriculum and learning materials) – were used to capture rich data to understand learners' sense-making. Semi-structured interviews (each learner was interviewed at least twice, at the beginning and the end of the course) focused on seeking to understand how different spaces, tools and artefacts mediate the activity of learning and sense-making as they progressed through their learning journey. To triangulate the data, adult educators, curriculum designers and, where possible, workplace supervisors were also interviewed on their views of learners' experience, as well as curriculum design, delivery and support provided. In the case of the educators, this additionally involved informal discussions following observations of sessions. A summary of the data collected is provided in Table 1 below.

Table 1: Summary of the data collection

Industries/ Courses		Learners	Adult Educators	Curriculum Designers	Workplace Supervisors	Inter-views	Participant Observation
Healthcare	1	4	4	1	0	17	8
	1	4	2	2	3	18	8
WSH	1	4	2	2	0	11	5
	1	4	1	1	N.A.	5	2
ICT	1	3	1	1	N.A.	10	4
HR Management	1	4	3	3	N.A.	7	3
Total	6	23	13	10	3	68	30
Total Duration (minutes)		N.A.	N.A.	N.A.	N.A.	5 440	7 200

The analysis of the interviews and observations was conducted by applying Braun and Clarke's (2006) six phases of thematic analysis. The themes for sense-making and influencing factors identified as shown in Chapters Three and Four were established after an initial familiarisation process with the interview transcripts where patterned and significant responses were highlighted and noted down. The initial themes in this case are defined as the most basic forms of data categorisation (Braun & Clark, 2006) and were extracted from the transcribed interview data based on their relevance and significance to the research topic. These codes of themes were then collated and analysed to identify differences and

commonalities between them. From this, through a reduction process, coherent and relevant themes representative of the codes and data sets were established. A theme in this analysis is referred to as a collection of “patterned responses”, which captures something relevant and important in relation to the research question (Braun & Clarke, 2006, p. 19).

In addition to this process, we constantly returned to the data in its original form as questions and contradictions became evident. For example, in conceptualising sense-making, we found that our understanding from the review of the literature was somewhat different from the themes we developed from our data. We looked for further quotes that may have been missed in our original coding frame against sense-making nodes and interrogated this data in further detail, constantly asking what is happening for learners in each instance. The thematic analysis in relation to the mediation of sense-making was important in contributing to the conceptualisation of this process, as discussed in Chapter Four.

1.4 Structure of the report

Following the introduction of this research study in Chapter One, Chapter Two will present the literature review for the project from different theoretical perspectives of sense-making. The literature review establishes that both cognitive and sociocultural theory should be adopted to understand adult learners’ sense-making in BL in the project. Chapter Three will unpack how adult learners make sense of their learning from different cases studies of BL. Following the unpacking of their sense-making process, Chapter Four will discuss how industry context, TAE context, and curriculum design and pedagogical practices are influencing learners’ sense-making process individually and collectively. Drawing on the findings from Chapter Three and Chapter Four, Chapter Five will present some recommendations for TAE practitioners on how to design and implement BL more effectively to facilitate learners’ sense-making and translation of learning. In addition, it will propose some recommendations for accreditation bodies on how to assess the quality of BL courses on the market.

2. Literature Review

2.1 What is sense-making?

There is a considerable body of literature that informs us how adults learn at and through classroom, online teaching or work (Billett, 2001a; Boud & Molloy, 2013a, 2013b; Bound, 2010; Bound & Lin, 2011; Fenwick, 2008a, 2008b; Nicolini, 2012; Wells, 2000). However, we know considerably less about how learners make sense of their learning in and across these different settings.

Sense-making usually occurs when people encounter something that is abstract, confusing, uncertain or new (Malitis & Christianson, 2014; Weick et al., 2005). The process is described as ongoing; there is no stop and start point. The absence of a beginning (or end) in sense-making means that people may not always consciously make sense of things – they just do so, as events unfold within their experience (Weick et al., 2005). Dialogue and interaction are integral to collective sense-making (Maskiewicz & Winters, 2012; Weick,et al., 2005) and serve as a springboard to action (Albolino, Cook & O'Connor, 2007).

Weick et al. (2005) identify features of sense-making as noticing difference (resulting from, for example, feelings of uncertainty that something is new, abstract or not quite right), followed by attempts at categorising and then labelling (naming) what is happening. The environment where sense-making takes place influences such processes, e.g. previous actions of self and others, protocols that "need" to be followed, and the culture of the organisation. Thus, sense-making is distributed across the organisation systemically. The next question asked in the process of sense-making is "what do I/we do now?" This is the action part of sense-making, which is important in organisational sense-making; it involves talking with others; thus, communication is central to sense-making as a social process. In summary, sense-making:

1. starts with organising chaos, noticing and bracketing;
2. is about labelling and categorising to stabilise the stream of experiences;
3. is retrospective;
4. connects abstract knowledge with the concrete instances;
5. is social and systemic;
6. is about organising through communication; and
7. is about what actions to take. (Weick et al., 2005)

Turning to another body of literature related to learning, Vygotsky's work provides a useful linking, but somewhat different perspective, from the work of Weick and others. Vygotsky's work was aimed at "generating an account of learning in which mind is making sense and externalising understandings by acting on the world using the tools available to change it for the better" (Edwards, 2010, p. 6). Action is mediated by the cultural resources in our environments (contexts). Language – and thus communication – and action find some

common ground with Weick et al.'s (2005) account of sense-making. Lave (1988) notes that cognition in everyday practices is distributed over mind, body and settings. Researchers, such as Lave and Edwards, highlight the mediation of cognitive processes. Weick et al.'s (2005) references to noticing, categorising, retrospectivity and so on prompt questions such as "can cognitive theories provide further insights into sense-making?"

Kolb's classical experiential learning theory (1984) comprises four elements: experience, reflection, conceptualisation and experimentation, where "engagement may move back and forth between processes, such as reflection and experience (or any other parts of the experiential cycle)". There is considerable connection between the four elements and the processes of sense-making as listed from Weick et al.'s (2005) work. Ambiguity, confusion or uncertainty is a result of experience; reflection and conceptualisation are where individuals and collectives look back, recall and make comparisons to begin the process of naming, categorising and linking to what is known from their own experiences and from theory; and active experimentation is putting that meaning-making into action. It seems that Kolb's elements of experiential learning theory can be readily linked to sense-making processes as outlined by Weick et al. (2005). Kolb's elements provide additional insights into the processes of sense-making listed above.

But there is more to sense-making that needs to be understood. As Edwards (2010) and Lave (1998) highlight, cognition is a sociocultural process. Weick et al. (2005) identify culture and rules of an organisation in which sense-making occurs, naming this process as social and systemic, suggesting that sense-making is not just influenced by context, but also mediated. Within any given context, the cultural, social and material both influence individual and collective sense-making, including actions that in turn influence the context/environment. In such ways is change affected in everyday activity.

In summary, sense-making is an integral part of learning, particularly from the organisational perspective. It is more than a cognitive process of individuals, but more important, a sociocultural process which is interacted, influenced and mediated by various contextual factors.

The different features of sense-making described by Weick et al. (2005) reflect the mix of different theoretical perspectives. The first four features of sense-making (1, 2, 3 and 4) tend to speak to a cognitive perspective of sense-making. Kolb & Kolb (2005; 2008) describe that when sense-making is a cognitive process, learners tend to conceptualise their experience and work at resolving any conflict or disagreement arising from their own beliefs with the new experience. Learners will also attempt to cognitively reconstruct their experiences as they learn to adapt to change. The cognitive aspect of sense-making provides information about how learners make sense when learning about their environment. The processes, such as interpreting, evaluating, critiquing, sharing, summarising and synthesising information, take place while individuals or collectives construct an understanding about situations, concepts or phenomena, or attempt to solve problems (van Aalst, 2009). Hence, the role of cognition in the sense-making of one's environment is to help in assimilating new knowledge and in restructuring existing knowledge (van Aalst, 2009) into something meaningful for the individual.

The last three features of sense-making[2] tend to represent a sociocultural perspective of sense-making. The sociocultural perspective focuses on engaging in a communicative process with others to arrive at a shared understanding and is premised on the understanding of learning as a social process, taking place and mediated by specific contexts. The sociocultural perspective of sense-making recognises learning as a social and communicative process. This perspective captures the participatory nature of learning not only in the verbal processing and exchange of cognitive information, but also through the communication and understanding of one another's cultural backgrounds and practices (Paavola & Hakkarainen, 2005), as well as interactions with artefacts (Fenwick, 2008a ; Nicolini, 2012). With such interactions, higher forms of thinking come into existence. The process through which higher forms of thinking come to be is called internalisation. In this collective process, each member plays a role in contributing to the knowing of others, as people attempt to collaborate with one another, negotiate and clarify the meaning of their experiences with other people so as to build knowledge and understanding, that will enable collective action (van Aalst, 2009; Paavola & Hakkarainen, 2005; Wells, 2002).

Sense-making through interactions also enables the development of new knowledge and generation of ideas among communities, not just adding to and complementing one another's knowledge (van Aalst, 2009; Engestrom, 2001; as cited in Chun, 1998; Paavola & Hakkarainen, 2005). In addition, sense-making does not just occur with social interactions, but with material interactions as well (Mau & Ambrosio, 2003; Naykki & Jarvela, 2008; Paavola & Hakkarainen, 2005; So, Seow & Looi, 2009). After all, humans live in an environment surrounded by objects, tools and technology; our learning activities are therefore entwined with the use of such resources (Fenwick, Jensen & Nerland, 2012). The sociocultural perspective includes others as well as the tools, cultures and other features of the environment in the learning, exchanging and construction of knowledge, and acknowledges that people learn not only by knowing but also by doing.

The discussion of the theoretical underpinnings of the current understanding of sense-making points out that sense-making includes both cognitive and sociocultural perspectives of human development. Drawing on the mix of these theoretical perspectives, Section 2.2 below will review some empirical studies on learners' sense-making experiences, which are mediated by different factors.

2.2 Factors mediating sense-making

In this section, different factors that have been identified as promoting or inhibiting the effective sense-making process of learners are related to the use of pedagogical strategies to convey concepts and capability development, the design of the BL curriculum, as well as the guidance and support from workplaces. The following subsections will elaborate on how these different factors affect learners' sense-making in BL environments. However, the BL in most of the studies we found in our review of the literature comprised mainly classroom and tech-

[2] 5. is social and systemic;
6. is about organising through communication;
7. is about what actions to take.

enabled learning. Few studies have included workplace learning as part of BL, which the present study aims to fill.

2.2.1 Pedagogical strategies of blended learning and sense-making

Pedagogical strategies are methods used by educators to help their learners achieve their learning objectives and meet the intended learning outcomes of intentional learning. This subsection reviews some studies on how different pedagogical strategies affect adult learners' sense-making in BL. The review of these different pedagogical strategies illustrates that their effectiveness for learners' sense-making experience does not take place automatically; the scaffolding from the teachers or facilitators who use such pedagogical strategies plays a crucial role.

Learners' reflective practices (Koh, Shibani, Tan & Hong, 2016; Shorey, Siew & Ang, 2018) help them engage in the sense-making process in BL contexts. Facilitators need to ensure that learners have a clear idea of what is expected of the reflective activity and provide necessary scaffolding. For example, in Shorey et al.'s study (2018), weekly online reflections were done by nursing students who took a redesigned communication module that included classroom learning via regular face-to-face tutorials and technology-enabled learning via online videos, forums, quizzes, assignments and reflections to be completed or viewed by the students. These were analysed by the teacher and shared with the students to help them cultivate a habit of reflecting frequently as well as keep track of their learning progress. The result of the study revealed that such reflections helped the learners engage better in the process of consolidating and reviewing the content they had learned weekly and being able to form connections between old and new content, which is one of the primary features of effective sense-making.

Another commonly used pedagogical strategy is the flipped-class approach, which was found to benefit (Strayer, Hart & Bleiler, 2015) or inhibit (Chen, Ramos, Phua & Cheng, 2019) both learners and educators, as the flipped-class strategy was used differently by the facilitators. In the study by Strayer et al. (2015), the flipped-class approach allowed facilitators to curate in-class sessions and activities that helped the students overcome their challenges encountered during online learning. For example, in one of the cases where learners were learning mathematical concepts based on online tasks and from what the students submitted, facilitators could identify areas that required deeper understanding and start discussions on such areas. This pushed learners' instrumental understanding (i.e. knowing how without knowing why) to a relational understanding (i.e. knowing reasons behind actions) in mathematical concepts. Such a facilitation helped students get a systemic and holistic understanding of the mathematical concepts learned, thus improving their sense-making. However, in another study by Chen et al. (2019), the flipped-class strategy used in Singapore classrooms does not bring about the same effect as the above study, as flipped-class is just used as a means for learners to "download" the content, but are left alone to explore the content with insufficient facilitation or support from the educators. The study revealed that most of the time, the adult educators did not manage to build up the link between online and classroom learning due to time constraint or lack of experiences. With such missing facilitation from adult educators to link online and classroom learning, learners may face some challenges in making differentiation, categorisation and connection of the concepts in different learning

environments, resulting in inappropriate actions in making use of these concepts, which are critical to sense-making in BL.

In summary, while the studies above show how different pedagogical strategies could be useful in learners' sense-making, they may overlook the roles that the curriculum design of BL play, particularly in the authenticity of the learning offered in the curriculum. The studies on the curriculum design of BL will be reviewed in Section 2.2.2 below.

2.2.2 Curriculum design of blended learning and sense-making

Curriculum design in BL can influence sense-making both positively and negatively. The benefits of curriculum design and technology use on sense-making can be seen from the study by Gleadow, Macfarlan and Honeydew (2015), which examined the influence of implementing a BL (classroom + tech-enabled learning) curriculum in a university course. This BL enhances learners' sense-making by facilitating learners' conceptualisation and developing learners' active thinking. Initially, lecture attendance usually dipped below 20% by the end of the semester, with a survey on graduates finding that only 20% of students would have taken the subject if it had not been compulsory. With the introduction of a BL curriculum, the designers made improvements to the e-learning platform, such as changing the website's aesthetic design to be more open and descriptive, and making obvious the actions learners needed to take to reach certain learning objectives. The learning pathway was modified to present clear themes and topics that helped learners understand the progressive and cumulative knowledge building they were going through, and to aid the synthesis and application of key concepts. Learning activities were improved, with the writing revised to help learners identify the purpose and make more sense of the activities. The improvements enabled by these implementations could be seen from students' feedback, where 80.5% agreed the site was logical and information was easily accessible, while 55.2% strongly agreed that information about the assignments was easily locatable. By contextualising lectures and including them in online learning, more students were found to be better engaged intellectually, instead of passively receiving information. With the enhanced design of online learning, it was found that the learners in this course were empowered with active planning of their learning, which involves the easy identification of the key concepts, and synthesis and connection of these key concepts, and where to apply these concepts, which are all important features of high quality of sense-making as discussed in Section 2.1.

In contrast, when the design of BL does not make learners' needs a focus, but instead focuses on the technology, learners may suffer in their sense-making process. The study by Ahmad and Orion (2010) on the technology use in IBM shows how poor use of technology at the workplace can be ineffective and a waste of resources, while good application can have vastly different results. In their study, they observed how IBM initially considered using smartphones to deliver their employee development mini-courses. This was expected to assist learners by allowing them to access these courses anytime and anywhere. However, it was found that employees from most units did not use their phones to study online courseware but for in-field performance support instead. On realising this, IBM has since adjusted the technology use to help employees better solve immediate challenges at work. By doing this, the employees can receive appropriate assistance exactly when needed, demonstrating that the importance of being clear about the purpose in the use of a technology is to facilitate the employees to learn effectively at the workplace. The findings show the importance of

customising BL according to learners' real needs in their sense-making process. This study reveals that merely including technology use to convert the traditional course into BL without considering the real needs of the learners in such design may cause failure in their learning. Again, we can conclude from such studies that learners' sense-making at workplaces is likely to be enhanced when technological applications and learners' real work needs are integrated. Such integration would enable learners to apply what they have learned in online mini-courses to solve or tackle their immediate work challenges, instead of just accumulating knowledge from the easy access to such online mini-courses.

While both of the studies illustrate how tech-enabled learning can function differently in adult learners' sense-making, without authentic workplace learning, the advantage of BL may be limited as learners were not provided with opportunities to apply what they have learned in authentic settings. This speaks most to the action aspect of sense-making. Furthermore, authenticity is more than "real work setting and work/profession practice. These include the mutually constitutive and dialogic nature of knowledge (Wells, 1999), the collaborative aspect of work and the holistic or 'authentic wholeness' (Ross, 1999, p. 154)". For example, Bound, Chia & Karmel (2016) found how important authentic workplace learning is for cooks in their ethnographic case study. In the real workplace, cooks are able to learn about the nuances of the workplace tasks. The study showed that by involving workplace learning, the cooks realise that "professional cooking is much more than these step-by-step tasks; it also involves deep interaction and cooperation with colleagues in the kitchen, and relies on close coaching/mentoring by chefs" (p. 52). In a rota commander course, Bound et al. (2016) found that officer cadets/learners are assessed based on a checklist of tasks and scored along a five-point scale during the final exercise. However, during the final exercise, the learners were taught the finer points of command and control through assessor-led demonstration and questioning, which illustrated the instructional sequence to "authentic learning" where there is some variation of "modelling, coaching and fading" (Brown et al., in Ross, 1999, p. 154). This case illustrates how authenticity occurs "not in the learner, the task, or the environment, but in the dynamic interactions among these various components … authenticity is manifest in the flow itself, and is not an objective feature of any one component in isolation" (Barb, Squire & Dueber, 2000, in Herrington et al., 2002, p. 2). As revealed in the reviewed studies, the authenticity in environments, in tasks, and even in interactions in the design of BL play a crucial role for learners' sense-making because such authenticity may strengthen the application aspect of sense-making for learners to take appropriate actions in their workplace practices.

The review of these studies on curriculum design of BL shows the importance of quality in design in terms of how different components are integrated together, together with the focus on the learners and inclusion of authenticity in the design, for adult learners' sense-making in BL. Furthermore, beyond "real work setting and work/profession practice", authenticity in sense-making should be holistic, interactive and collaborative. Section 2.2.3 will discuss what affordances in work environments can enable more authentic, mutually interactive and collaborative sense-making in BL.

2.2.3 Affordances of work environments in blended learning and sense-making

The above discussion shows that most of the earlier studies on BL tend to overlook the importance of action aspect of sense-making, which could offer opportunities for the application of theory into practice. Including workplace learning in BL is one way but not a final and automatic step to help learners enhance the action aspect of their sense-making. The action aspect of sense-making in workplace learning does not take place automatically. It can also be influenced by other contextual factors, such as affordances at work environments. According to Billet (2001c), work environments that provide opportunities for learning could come from both direct and indirect support. The quality of sense-making in workplace settings is influenced by the different affordances that either encourage or discourage learners' sense-making.

The case studies reviewed here bring out the importance of peer and supervisor support in helping learners' sense-making effectively, since being able to utilise and translate training (taking appropriate actions) is a good indicator of sense-making from one's training. Unfortunately, despite some findings that showed the benefits of peer and supervisor support, the lack of peer and supervisor support has been found across various workplaces, which reduces the opportunities for workers to learn new tasks and/or improve existing skills, thus hindering their sense-making process at work.

Peer and supervisor support is an example of an affordance for learners' sense-making at the work environment, which can enhance learning, or hinder a learner's growth in the long run when absent (Billett, 2004). Cromwell and Kolb (2004) examined the influence of organisational support, supervisor support, peer support, and peer support networks on workplace application of skills acquired from a training programme. They found that all four forms of support were positively correlated with the application of knowledge and skills. The study showed that positive application of training was only found a year after training. While trainees were encouraged to promote participatory management and empowerment techniques, their supervisors who did not undergo the same training were more used to autocratic methods. For their supervisors to change from an autocratic style towards more empowering approaches required a cultural change, and this took time, which could have contributed to the delayed application of training by trainees. This finding is supported by Brinkerhoff and Montesino's (1995) study, which found that trainees receiving management support displayed significantly higher application of what they learned, and they had a more positive perception of the forces within the work environment that encouraged application of what was learned in training.

In contrast, some studies (Bernhardt, 1999; Lave & Wenger, 1991) found that lack of support from workplaces may inhibit the learners' application of what they have learned. These studies also explored the reasons for the lack of support at workplaces. As Bernhardt (1999) found, full-time pharmacy chain store retail workers intentionally limited the work of part-timers and afforded less support to retain their own position at work. These results were replicated similarly in other occupations, like how coal miners were found to provide co-workers varying degrees of support depending on their connections within the industry and seniority (Billet, 2001b). This could be caused by competition in the workplace between new workers and long-time workers. While new workers might try to participate more at work, long-time workers who

fear losing their position might withhold access to tasks or guidance (Lave & Wenger, 1991), in an attempt to secure valuable opportunities for advancement or remuneration (Billett, 2004).

In summary, the workplace is a place full of authenticity and opportunities for trainees or new workers to take appropriate actions and make application of their knowledge gained from training. However, whether such an important feature of sense-making could be manifested is highly affected by whether workers are given the support and encouragement from the work environment to do so. Therefore, as claimed at the beginning of this section, inclusion of workplace learning does not guarantee the action aspect of sense-making by workers; rather, other affordances, such as organisational cultures, supervisor support and peer support, may need to be considered as well in order to support sense-making.

This section discusses the studies on how workplace affordances can promote or impede learners' sense-making, particularly the role of peer and workplace supervisor support in workplaces. Merely including workplace learning in BL may not contribute to learners' high quality of sense-making without corresponding opportunities for them to take actions to make application from training to work.

2.3. Conclusion

This chapter firstly introduces the concept of sense-making and its theoretical underpinnings. Drawing on the current understanding of sense-making, this chapter also reviews some empirical studies on how pedagogy, curriculum design and workplace affordances can exert influences on learners' sense-making effort. The review of the empirical studies confirms the theoretical underpinnings of sense-making, which is not only a cognitive process, but also a sociocultural process for the learners. Every minute part of BL may play a critical role in the sense-making experience. Design and delivery of BL requires a lot of attention in order to ensure a high quality of sense-making experiences for adult learners.

Chapter Three and Four will present the main findings of the case studies on the quality of the learners' sense-making experience in this research study and how different contextual factors working together influence their sense-making experiences in BL.

3. Unpacking Adult Learners' Sense-making

In this chapter, we will analyse the data across the six ethnographic case studies to reveal a deepened understanding of sense-making than currently exists in the literature. In summary, we found that sense-making in this research study unfolds as an iterative process. In this process, people engage with the developing circumstances from which they observe differences and extract cues to make sense retrospectively, while attempting to make sense of the fresh circumstances they are experiencing. Based on our analysis of the data collected, we found the seven features of sense-making identified by Weick (1995) to be more nuanced than indicated in previous studies. The definitions of each of the seven features, as we define them, are in Table 2.

Table 2: Definitions of sense-making features

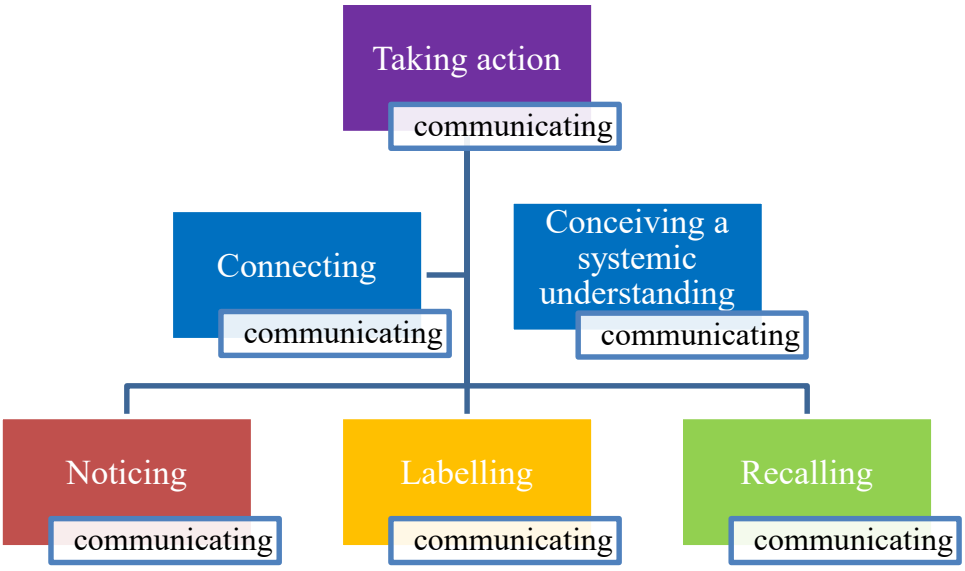
S/N	Sense-making features	Definitions
1.	Noticing	A process of observing, identifying and experiencing similarities and differences across various situations, conditions and contexts
2.	Recalling	A process of recollecting, reconsidering and deliberating on past experiences
3.	Labelling	A process of grouping, comparing, naming and evaluating observed similarities and differences and their extent in knowledge learnt, conditions and contexts
4.	Connecting	A process of making efforts to link the theoretical and practical knowledge, individually and collectively
5.	Conceiving a systemic understanding	Development of a way of thinking to deepen understanding of all aspects of professional knowledge or practice within a wider context, to enable learners to better position themselves in the profession
6.	Communicating	Social and interpersonal processes to further understand what is learnt, e.g., asking questions, posing considerations, predicting, seeking clarifications
7.	Taking action	Reflection on the outcomes that comes from translating or applying the learning

There is no specific sequence or order in which any of the features of sense-making occurs. In different sense-making occurrences, some features may be interrelated while some may occur more frequently than the rest. For example, communicating is a relatively prevalent feature in the sense-making process, and it tends to be interrelated with the rest of the features in the sense-making process. That means that learners in this study attempt to make sense of their learning not only in a cognitive way, but also in a social and interactive way by interacting with different stakeholders in

their learning journey. All these different interrelations will be elaborated in the different case studies in the following sections.

In addition, the present study has also found that there is a hierarchy within the different features in terms of creating different depths and kinds of quality of sense-making in BL, as shown in Figure 1 below.

Figure 1: The hierarchy of sense-making features in blended learning



The three bottom features of sense-making in Figure 1 – noticing, labelling and recalling – are the fundamental features of sense-making. However, a predominance of these features in sense-making denies learners of the full potential of sense-making, limiting the impact sense-making could make to learning outcomes. If the features – connecting and conceiving – are more evident and frequent, the quality of the learners' sense-making tends to be better as learners would be better able to apply their learning across different learning environments. If the top feature – taking action – is more evident in learners' sense-making process, their sense-making attains the highest level as learners seize opportunities and actually apply their learning across different learning environments.

In summary, the present study has found that the sense-making process of adult learning in BL tend to be ongoing without a specific sequence of these different features. However, the different uses of these features and their frequency shaped the depth and quality of an individual's sense-making process, indicating that the frequency of these features across case studies may bring about different sense-making experiences for the learners. The following sections of this chapter will unpack the findings of adult learners' sense-making process, so as to show the varied depth and quality of sense-making across these case studies.

In categorising the nature and quality of learners' sense-making of each of our six case studies into limited, strong, deep and the deepest sense-making, we used the following process:

1. Coding the data against each of the features of sense-making separately for each BL course by three different researchers, checking the inter-rater reliability of the coding across the researchers and refining the definitions of the features to make sure all the researchers reach a consistent understanding;
2. Drawing on the refined definitions as shown in Figure 1, recode the data by each researcher to make sure that the inter-rater reliability can reach 85%, then quantifying this data by counting the instances of each feature;
3. Grouping the courses based on the different patterns of the features present in the data analysis;
4. Categorising the different groups of courses together where there were similarities in terms of the patterns of different sense-making features and recoding and recounting;
5. Generating the pie charts shown in the following sections, which show the distribution of each feature and the interrelationships between the features of sense-making. The interrelationship was established when different sense-making features were found in the same coding.

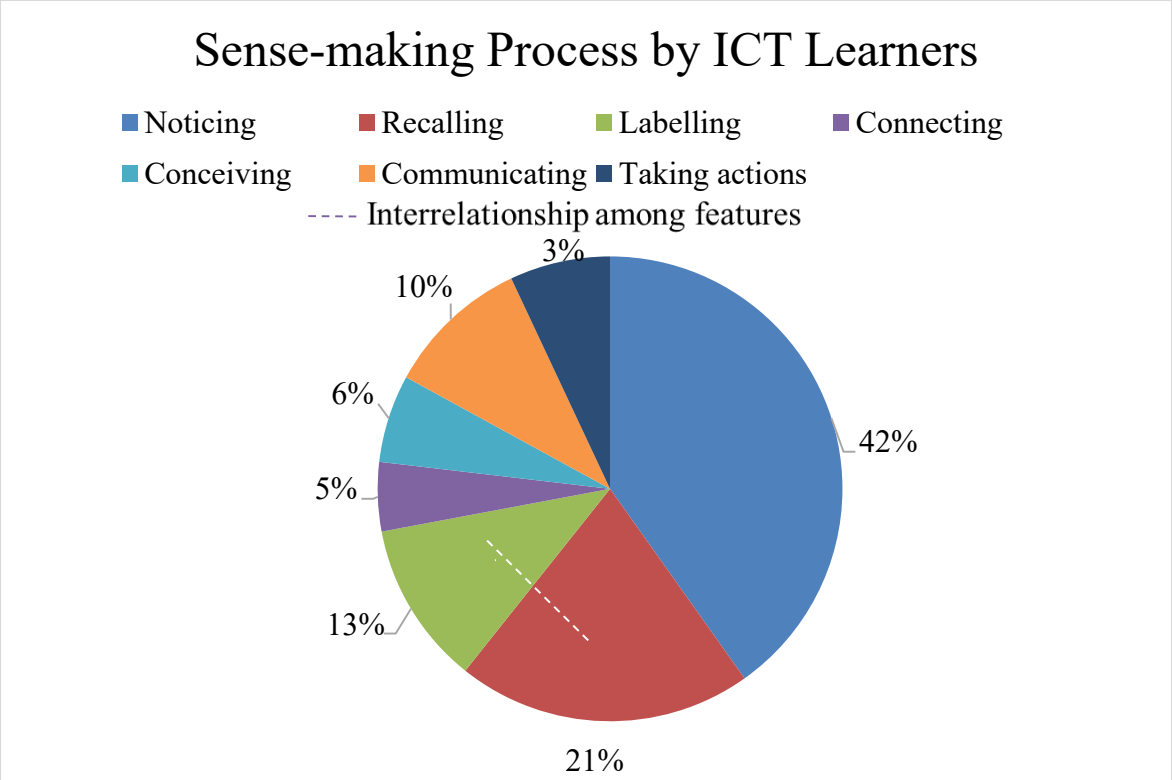
3.1 Limited sense-making process

Limited sense-making mainly comprises the three features – noticing, recalling and labelling, while the rest of the features are not so frequently present in the sense-making process. The prime example of this in the study is the ICT course, a six-module Professional Diploma that can be taken full-time, over three months, or part-time, over six months. In this course, the training provider claims that the learner will gain in-depth knowledge of how System, Application, Products (SAP) Enterprise Resource Planning (ERP) systems support business operations within specific functional or technical domains in an enterprise, e.g. Finance (FI), Human Capital Management (HCM), Sales and Distribution (SD), Materials Management (MM) and Advanced Business Applications Programming (ABAP). With the certificate gained on completion of this course, learners are expected to be able to work as a SAP consultant whose job scope is to maintain the components and functionalities of SAP applications to fulfil customer's demand and to customise SAP applications, as well as to find and fix issues and recover the original functionality of these applications. The course is structured so that learners are engaged in e-learning (80%), and they have 24/7 access to e-contents for each module for one month. Learners who need help can approach tutors during tutorial sessions, where they are provided with one-to-one support regarding the course materials or technical matters. The remaining course (20%) was conducted via face-to-face flipped class lectures aimed at providing guidance to make sure that the learners are learning the correct skills by themselves in e-learning.

However, at the end of the course, the learners shared that they still lacked the competence and confidence to apply for relevant jobs mainly because they were not provided with opportunities to apply what they have learned nor did they experience any application in

authentic workplaces. Their sense-making process, as represented in Figure 2, explains why learners in this course experienced limited sense-making. Figure 2 is drawn according to the distributions of the different sense-making features in ICT learners' sense-making processes. Besides the distribution of these features, the interrelationship among the features is also marked by the dotted line. The interrelationship among the features means that different features may occur together in their sense-making, rather than independently all the time. Please refer to the legend in the figure below.

Figure 2: Sense-making process by ICT learners



From Figure 2 above, the adult learners in this ICT course spent most of their time noticing differences (42%), recalling past experience (21%) and making comparisons (13%). They seldom connected theory with practice (5%), or conceived a systemic understanding of the SAP programme in relation to their organisation(s) or the context of their industry (6%). Another less evident feature in the data was taking actions to apply what they learned (3%). All of the learners in this course spent much time recalling their past experience of using accounting systems and trying to identify the differences between the old and new systems, as well as identifying the discrepancies between the actual learning in the course and their expectations based on the enrolment information. The dotted line indicates that the sense-making features connected by the dotted line take place concurrently. In this instance, recall and categorisation. This suggests that their sense-making processes are not well linked with different features, and thus, they are limited.

Apple (one of the learners) recalled that when they were enrolled in this course, the training provider promised the learners that the licenses for the e-learning materials had been obtained. However, during her use of the e-learning materials, she realised that she could not download the e-book, their main e-learning material. She can only snap the pictures of the

screen to print. Such a frustrating user experience made her irritated because of the inflexible presentation of the materials.

Besides such discrepancies, Apple also commented that there was a mismatch between the learning outcomes as claimed by the training provider and what was experienced by herself.

> Their (school) aim is to equip the student to be an SAP consultant. **I can tell you that it's really really not up to the standard.** Not just fall short, they are not… If let's say you really want to have an all-rounded SAP. Unless you say that this consultant only focuses on FI and only doing the, like I said, asking question and translating the question to the SAP consultant, if possible. However, even so, we can only do the FI[3] part, not the MM[4] or SD[5] part. Just one part, so is it enough? Obviously if let's say like I said, unless you label this consultant will only do FI, only do a certain part. Yes, it's possible. **Otherwise, if you just put SAP consultant, I think, cannot. You don't even know the MM or SD**. (Apple, Learner from ICT course)

In the above sharing by Apple, she made it very explicit that there is a mismatch between the promise and the actual outcome of the learning. Another learner, Sunny, had the same experience, stating that he did not feel qualified as a SAP consultant after the course, even though the training provider would certify them as a SAP consultant.

> Yes, user wise, there is enough experience for me. Now I can do post journal, everything that's basically what you need to be an accountant, as a user. **They are teaching more as a user, than to be a consultant, but I don't think they have reached that level yet. Only classroom consultant, yes, but workplace consultant, I don't think so…**But you are certified as a consultant, you understand?... Yeah. **Unless you have workplace exposure, experience, how the system works in the workplace, then you can be straightaway a consultant, junior consultant.** But my company doesn't even use this system, I only have classroom experience...And if I go to the company and say that I am an expert at this, it is ridiculous. I am only a classroom expert. (Sunny, Learner from ICT course)

In addition to the insufficient content coverage, Sunny also commented that such a mismatch may also be due to the lack of workplace exposure or experience of using the SAP ERP system. Such a comment echoed the low frequency of the feature of "connecting" in ICT learners' sense-making. As shown in Figure 2, "connecting" appeared far less frequently in the features discussed above. This was mainly due to use of classroom and e-learning spaces, with no workplace learning or real case scenarios involved. The exercises the learners completed on the e-learning platform were not authentic and versatile enough for them to feel confident that they can become a SAP consultant in a company, as shown in the sharing of another learner (Berry).

> They are using the e-books provided by SAP, so the requirement by the SAP is that is a very good yardstick, not third party one, so you really have to make sure you know

[3] FI: Finance
[4] MM: Materials Management
[5] SD: Sales and Distribution

all these things so it's good; another one is the, for us, practical session one, that is SAP assessed, okay, for us to assume this is a SAP software when you go to a company, this is for you to do data entry, which is good, **but we need someone to tell us in real life this can be done in this way but you can also, you have to apply this book's knowledge and to the real case job scenario. You mention that hospitals, that type of practical session so it's…Here, we don't have; that is the gap.** (Berry, Learner from ICT course)

Without the workplace application of a SAP ERP system, Berry further shared that she was not confident to apply for a relevant job with the certificate obtained from this course. The lack of such a component in this BL course may also be reflected by the low frequency of connecting theoretical knowledge and workplace practices by these learners. For example, all the exercises in the e-learning platform for learners to practise on strictly followed the exercises in the textbook, which all the learners in this course felt were inadequate, when a lot of customisation were required for specific workplaces.

Learners' experience of BL in this course was one of frustration, as there was a huge gap between the promised outcomes and the reality of the course not equipping them to become SAP consultants as promised in the course materials. Basic flaws, such as systems failures, not enabling learners to download materials readily, the reliance on workbooks, and the requirement that learners had to complete modules in a short time frame, were all common complaints contributing to a focus on the lower quality of sense-making. Such complaints indicate disrupted and fragmented experiences hindering these learners from making a conceptualisation of a systemic understanding of how the SAP ERP system may apply to their specific workplaces. Their learning experience was relegated to a kind of rote learning to ensure the right buttons in the SAP ERP system were clicked. Learners' comments that there was no opportunity to apply theory to practice suggests this is a missing element in the course design. What influences curriculum design will be discussed further in Chapter Four.

3.2 Strong sense-making process

Strong sense-making involves the different features of sense-making in a more balanced way. This is illustrated in the healthcare courses in the present study.

The two healthcare courses are on Therapy Support and Optometry. Learners' sense-making processes in these two courses showed similar patterns, as illustrated in Figure 3. Both courses offered BL with classroom and workplace components. The course for Therapy Support was a 3.5-month full-time course, delivered through classroom lessons, skills laboratory training and clinical attachment in a healthcare organisation. Clinical attachment occurred at the end of the course. The completion of this course enables the applicant to work as a therapy assistant in a hospital, nursing home, day rehabilitation centre or senior care centre.

For opticians, the recognised qualifications include Advanced Certificate of Performance in Ophthalmic Dispensing. This course was a 240-hour (10-month) course delivered part-time with on-the-job training. The course was specifically designed to train new entry opticians in the technical skills and professional knowledge required in the optician field. It included modules such as physiological optics, ocular anatomy and ocular physiology, geometrical and physical optics, business principles for optician practice, optics and the eye, ophthalmic optics,

legislation and ethics, and ophthalmic dispensing. Successful completion of this course would enable the applicant to register as an optician with provisional[6] license in dispensing with the Optometrists & Opticians Board (OOB). The following graph represents the learners' sense-making in these two healthcare courses.

Figure 3: Sense-making process by healthcare learners

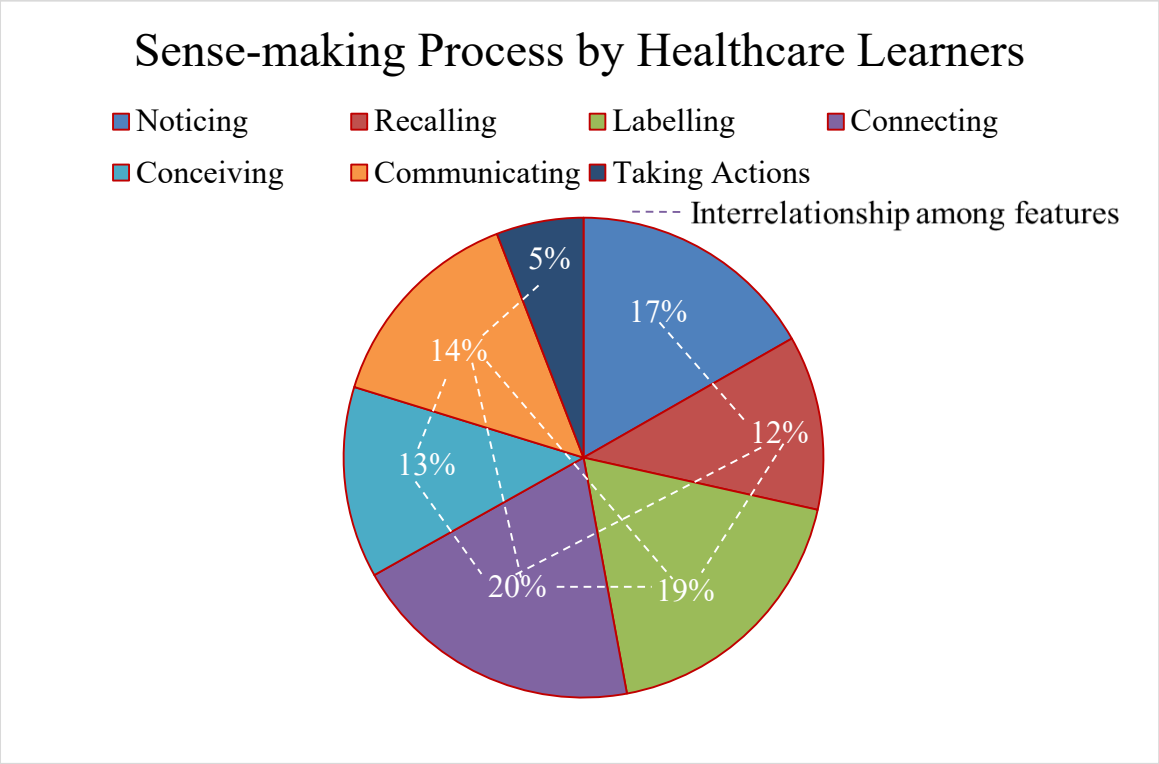


Figure 3 shows that adult learners in these healthcare courses were provided with more opportunities to make connections between theory and practice (20%) as compared with the ICT course, in addition to noticing (17%), recalling (12%) and labelling (19%). They were also able to conceive a more systemic understanding of the industry practice throughout the entire learning process (13%). In between these sense-making features, communicating with other stakeholders (14%) was more apparent than in the ICT course. The dotted lines indicate features of sense-making that were happening simultaneously. For example, communicating does not appear with noticing or recalling. Learners were not required or given opportunity to share, or voice what they noticed, e.g. differences and similarities, which can enable connecting. The links between communicating, labelling and connecting were most powerful in the example of learners' sharing fried chicken over lunch, noticing the bones, labelling the different kinds of bones and fitting them together (connecting).

The following examples will elaborate on the above findings. In Henny's clinical attachment, she was assigned a workplace mentor/supervisor to supervise her throughout her

[6] Registrants would need to fulfil all the conditions under Supervisory Framework to be eligible for full licence.

attachment as part of the therapy assistant course, but she only followed the workplace mentor occasionally.

> Yah, we don't really follow her. Yah, maybe only once when she goes up to ... she assesses a new resident maybe. There was once a new resident came in, so she called me up, then we told her the case notes together, then she explained the, like, terminologies, so, okay, maybe they just had a fall, so that's why she's like, maybe weaker on this side. Then she tells me all the diagnosis, and **then she tells me to try to predict what caused her fall. Yah, so she makes me think through**, so she give me the, all her underlying conditions already, and stuff like that. And then, **when assessing the patient also, she, like, I just observe, because she's a therapist, then she, like, tests the resistance** to see how strong the resident is, so only that once I followed her. (Henny, Learner from Therapy Support course)

By communicating with her workplace supervisor on the spot about taking care of the patients in a nursing home, Henny was able to link what she had learned in the classroom to the real situation more effectively. Following her workplace mentors' instruction and demonstration on the spot enabled Henny to make observations of the difference between classroom learning and workplace practices, She then took notes and labelled these differences in order for her to do real and accurate diagnosis of the patients regarding their situations and then make appropriate decisions and actions on how to carry out the therapy for the patients. Such a linking process is embedded in the communications with others during the sense-making process. The limitation was that this experience appeared to be a one-off.

Tony's experience in the classroom enabled him to gradually shift his understanding from a layman to a professional through noticing differences between his own past observation and his current observation, for example, how to use the first aid. In addition, in making sense of the theoretical knowledge in classrooms, Tony gained a more holistic understanding of a patient's typical symptoms which need the therapy treatment. Such a sense-making process could prepare Tony for the upcoming clinical attachment to serve the patients better.

> **A lot of new things that we encounter,** Uh, things like, for example, uh, using, using first aids. So, when you are using those first aids right, normally people will hold the first aid on the injured leg. But now they are telling us that we are supposed to hold the first aid on our good leg……. So, now over here, we knew, I mean we learn things that, uh, we don't do it like a layman. …… **I think we understand, uh, we begin to understand** patients better……When we look at patients, what kind of symptoms that they are having? What kind of, uh, signs and symptoms that they are having? **We tend to have understanding.** (Tony, Learner from Therapy Support course).

However, when Tony started his clinical attachment, there was still a "culture shock" between the expected practices and the reality of practices in the workplace. He noticed big differences between what he learned in classroom and what he needed to do at workplaces, for example, the number of patients in clinical attachment was much more than what he expected. That means he had a heavy workload which the classroom learning did not seem to prepare him for.

> Yeah, quite shocked. **There is actually a culture shock.** Because we went into the ward and then suddenly we see rows of wheelchairs with patients sitting on them and

they were conducting exercise. So to us it's like "wow, how come so many people and then only one person conducting?" So it was quite a shock to us. We thought was just go there maybe one-to-one or one-to-two person, but this is really 40–50 people ah. Waiting for you to conduct lessons. Conduct exercise. So that one to me was like a culture shock. I didn't expect so many people to be there. **So after first week I think we got used to it because we got to listen to their life story. Yeah. So a lot of them are from various kinds of background. Then we begin to understand how they ended up here**. I think most of them are either dementia or Parkinson's disease or they have a stroke. Some are mentally not really sound. But they sometimes talk sense, and other times when you ask them, they talk things that are not relevant. So we begin to understand how they feel. (Tony, Learner from Therapy Support Course)

The culture shock indicated a disruption of expectations, different from what they learned in class. Tony indicated it took about one week to make sense of what was going on by making observations and comparisons of the differences; communicating with patients to understand their life stories and backgrounds was a key part in this process to help him better get used to this totally new scenario. Tony also showed strong personal agentic will to seek a systemic understanding of the job role as a therapy assistant as it intersects with other professionals to shape his professional identity as shown in the below excerpt. His agentic will helped him gain a more holistic and systemic understanding of the role of therapy assistant in relation to other roles in the same setting.

I think I have to read up more on this. **I'm actually looking for some textbooks to read up more not only on therapy assistant. But I wanted to know more about my, the other colleague, nursing side, what they actually do. So when I talk to them, I will be able to understand what task they are doing, what kind of difficulties they are facing. So at least if I understand them more,** then I can mix with them to do my job better…I mean you may know your therapy assistant job well **but you still need to know what the rest of your colleagues do. So in that way, you can understand them,** I mean, if they suddenly become very angry or what., maybe you are doing something that's not right, so I think that it is very important to know what your other colleague is doing also. (Tony, Learner from Therapy Support course)

In another BL healthcare course, which is on Optometry, learners experienced a similar sense-making process as the learners in Therapy Support course. One of the learners from the course shared about the importance of linking theory with practices and working with teams through constructive communication.

You have no right to touch anyone. Let's say I want to measure your pupil distance I need to touch you. I need to come close to you. **So this kind of right, you don't experience every day. Maybe you can practise with your family, but you don't know if you are right or wrong. So you need a group, you need a partner, you need to practice on them. And then you practise on each other and then there is a tutor who comes and mentors you and says ok this is right, this is wrong.** So absolutely necessary otherwise this course is useless la…**So let's say the exercise, we practice the exercise first and then we share knowledge with each other of what we know which we are clueless whether it is right or wrong. And the tutor**

> **comes and sees our works in writings and papers and then ask us to perform it in front of her and him. So there are two tutors as of now for the practicals. So when we are performing they will assess your performance la. So they guide you which is right and wrong.** (Andy, Learner from Optometry course)

In his sharing, Andy highlighted the importance of guided practical sessions in enabling him to nuance his practices and better understand the boundaries in a task that involves careful judgement about personal space. Beside this, he also emphasised that feedback from the partners and tutors on the spot is crucial to his understanding of the practices and linking between theory and practice. All this sharing highlights the importance of constructive communication with others in his sense-making process.

However, as Andy described, lecturers in classroom and the tutors in practical sessions made little linkage between the practical and theory sessions due to lack of communication.

> So it's a totally different subject, so each of them takes care of their own subject. **They don't discuss what happened during the practical. I think it's also not required or necessary because it's a totally different thing that each of them is teaching. So though they know, I mean the tutor teaching me in my normal classes might know what's going on in the practical but it is useless for him to discuss about it because his motto is totally different.** He tutors us on some other topics. (Andy, Learner from Optometry course)

The sharing above reveals that there was weak structural relationship between theory and practice built into the design of the course. In addition, the observation made by the researcher during the classroom and practical session affirmed the above sharing. The lectures in classroom were teaching theories with some examples from their past industry experience. While the tutors in practical sessions were current industry practitioners who were running a spectacle shop at the moment, their teaching during practical sessions was purely based on their current industry experience with little theoretical knowledge mentioned. The days on which the practical sessions were scheduled were different from those scheduled for the classroom sessions. It was not common for lecturers and tutors to share with one another what they will teach the learners. Therefore, rather than leaving learners alone to link the different parts, some intentional facilitation between theoretical and practical sessions by adult educators may be more helpful in their sense-making. The disconnect between theory and practice was also evident in relations between the educational institution and the work sites. Learners took a checklist, prepared by the school, to fill in at the workplace. The role of the workplace supervisor was to check if the learner ticked the right items. In addition, during the single visit of the adult educator to the learners' workplace, only limited communication between workplace supervisors and adult educators was initiated for the progress and performance of the learners in either educational institution.

As discussed above, despite the strong sense-making evident in these two courses due to the inclusion of more constructive communications with peers, tutors or workplace supervisors, authentic practical sessions and workplace experience, there are still plenty of potentials to deepen their sense-making opportunities. The two courses have similar components of BL, classroom teaching, practical sessions in lab settings, and workplace learning. However, the limited communication and partnership across these different learning

environments, for example, the limited conversation between lecturers and workplace supervisors, and between lecturers and lab tutors contributes to difficulties for the learners' sense-making. This was particularly noticeable in relation to the action aspect of sense-making, impacting learners' opportunities to deepen their sense-making. As the learners shared in the above excerpts, classroom lecturers and lab tutors or workplace supervisors did not really discuss what was taught in different settings, resulting in learners themselves taking initiatives to explore and take actions, such as searching online and other resources to gain a better understanding. However, such self-exploration may not be holistic and systemic enough. Without intentional guidance and linkage from lecturers, tutors or workplace supervisors, the learners may face more challenges in gaining a fuller picture and taking appropriate actions to make application. The specific reasons for such sense-making processes will be elaborated in Chapter Four.

3.3 Deep sense-making process

Deep sense-making comprises connecting and conceiving features of sense-making more frequently than the rest of the features. That means learners tend to be more involved in making connections between theory and practice, and between different aspects of professional concepts and practices in order to better develop their professional identity and position themselves for the specific job role. In this case study, the learners from Workplace Safety and Health (WSH) BL course experienced such a deep sense-making process.

The course for WSH industry is a 26-month Maritime course provided by an educational institution in collaboration with government authorities and companies. The learners were recruited by both companies and the educational institution jointly for this course. At the same time, the selected candidates were offered job opportunities with the recruiting companies. The educational institution developed the curriculum and conducted the assessment in close collaboration with government authorities to ensure the currency of the course. This course blended classroom teaching, simulator learning and workplace learning. The workplace learning was sandwiched between different episodes of classroom learning rather than at the very end of the course, which lasted for one year. The completion of the course leads an individual to become a qualified deck officer. Though our researchers only managed to enter during the last five months of the course, from the adult educator's and learners' sharing, they were able to piece together a picture of the course.

Figure 4: Sense-making process by WSH learners

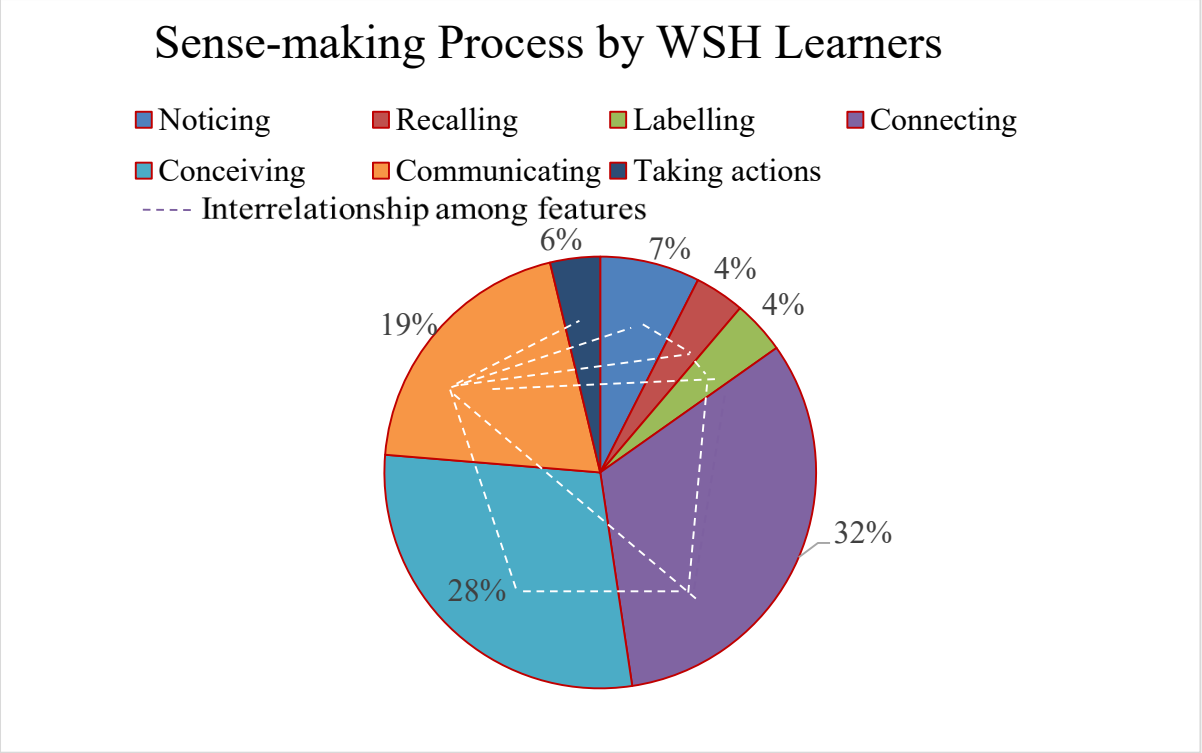


Figure 4 shows that in the WSH course, learners received more opportunities to make connections between theory and practice (32%) and conceive a more systemic understanding of the industry practice and job roles (28%) throughout the entire learning process in terms of the distribution of the features, as compared with ICT and healthcare learners. Comparatively, the rest of the features of sense-making were not so apparent in their sense-making process. In between these sense-making features, communicating with others was apparent too (19%). As indicated by the dotted lines, communicating (19%) is not only more frequent, compared to the healthcare course (14%), but also more widely distributed among the different sense-making features. This suggests that learners experienced different kinds of opportunities for sense-making than their counterparts in the healthcare course.

The following excerpts from the transcripts of these courses are presented to show how the learners were making sense of the course, as described in Figure 4.

> It's very… beneficial, because, during every simulator **I will try to test the… my manoeuvring skill, because that's the only place you can play around with your telegraph, and your steering, your communication-wise, you also can order them**. Because in simula… I mean, in real life, as a master, you have to order them to do the steering, and also to do the telegraph. I mean telegraph is like a throttle. So, as a master, you just oversee everything, you just give them commands, let's say, if you want to kick your, because we have to twin screw engine, port and starboard, starboard is right, port is left, and the propeller. So we just give commands, let's say, 'Starboard engine, dead slow ahead', so, we just command, and they do…… They will, I mean, the deck hand, the [AVs] will do the telegraph and the steering, so in communication-wise, we also can train during a simulator programme, so we can test the telegraph, so we know the characteristic of this propeller, the function of the propeller, the steering-wise, and you also can know how it responds. Because you rarely can do that during outside, **because, because it's a job…Yes, they did. It develop me, I think**

I'm much more competent…The simulator sessions. (Aify, Learner from Maritime Course)

Aify is not the only learner from the Maritime course to share with us the benefits of the simulator session for navigating the vessels. The sharing above reveals that Aify was provided the opportunities to try the steering, telegraph and communication among crew members during simulator sessions. Such experiences reminded him of the real workplace practices as a master on board a vessel. The vessel masters' role was to give commands to the cabin crew to do steering and telegraph, who usually do not have the chance to operate everything during navigation. With these practices of different roles and functions in operating a vessel, the simulator session not only helped these learners link theory and practice, but also deepened their understanding by developing a more holistic and systemic knowledge (and understanding) of the whole operating system. Aify commented that after the simulator session, he was much more competent in navigating the vessels. Another learner from the course shared that the simulator session prepared him well for the different scenarios in real workplace settings.

> Because, you will be onboard the ship every day, every day you'll be like, so-called, this, **control the vessel, bring up the vessel, so having this simulator, is another advantage for me, because you…experiential… experience, and you can like, justify yourself like, how do you encounter this kind of situation when you are onboard the ship…..So after the simulation, can you expect what will be like in your real workplace in navigating this vessel? Have you thought about it, like, if it's in the real scenario setting?**....Before, I mean before I get onto this simulator, I, previously when I was onboard the ship, I also did experience some of this so-called accident, but …, it's not a major accident, just a minor, where my vessel, there's a difficulty of coming onboard from another vessel due to the [weather], so I did experience. (Fonzy, Learner from Maritime Course)

For Fonzy, the authentic simulation session affirmed his past experiences that on board the vessel based on his observation, there could be many possibilities of unexpected scenarios. The authentic simulator session prepared him well to be ready for these possible unexpected scenarios. Therefore, he commented that the simulator session was quite an "advantage" for him. Besides experiencing simulated scenarios and practising their skills in the process, learners were also brought to a real port to gain some hands-on experiences in using emergency equipment. Such experience also helped learners make better links between theory and practice (connecting) as shared by Fonzy below.

> For Poly Marina usually is hands-on because of the lifeboats, the life vest, everything the distress signals, emergency signal you can't find that in the school. **Of course we have on board the ships, but we don't really use this on board the ship. Because usually this thing is for emergency use, in case of fires. But for this Poly Marina, they so-called helped us, I mean, they introduced to us how this thing works, so at least we know, oh let's say if anything happens in the future on board the ship, we know oh this thing functions like this, like this.** So that is one of the best, one of the good things about Poly Marina. (Fonzy, Learner from Maritime course)

Fonzy was able to link what he knew of his workplace practices and equipment with potential future unknown emergency challenges. He implied that understanding how rarely used equipment, such as emergency signals, contributes to their use in appropriate situations.

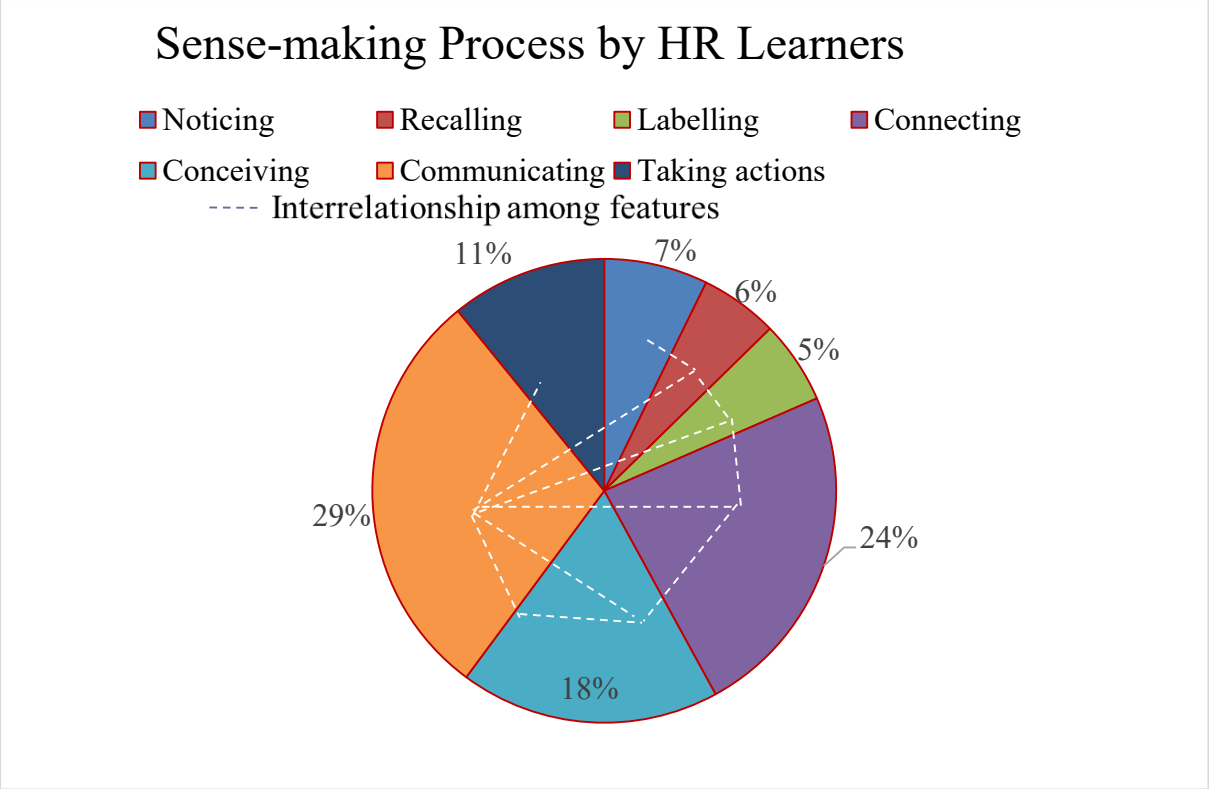
As revealed from the above discussion, sense-making in the WSH course is much deeper than the previous cases as it took place at the higher level with more occurrence of the higher level features, e.g. connecting and conceiving intertwined with communications between learners with various stakeholders in the courses. The reasons for such a deep sense-making process will be explored in Chapter Four.

3.4 The deepest sense-making process

The deepest sense-making, similar to deep sense-making process, comprises connecting and conceiving features of sense-making more frequently than the rest of the features. More importantly, the learners in this process receive more opportunities to take actions to apply their classroom learning to workplaces with constructive guidance, drawing on the close partnership between training providers and employers. In this section, the learners from the Human Resource (HR) course experienced the deepest sense-making process.

The HR course was mainly for the HR professionals in public service with at least five years of working experience. This course had three components of BL: classroom, tech-enabled learning and workplace application to solve authentic HR issues at learners' own workplaces. The course lasted about two weeks with a final check-in for the sharing of their final project on authentic work-related issues four months after classroom teaching. The following graph represents the learners' deepest sense-making process in the HR course.

Figure 5: Sense-making process by HR learners



Similar to WSH learners, Figure 5 shows that in the HR course, learners received more opportunities to make connections between theory and practice (24%) and conceive a more systemic understanding of the industry practice and job roles (18%) throughout the entire learning process, as compared with ICT and healthcare learners. Comparatively, the rest of the features of sense-making were not so apparent in their learning process. In between these sense-making features, communicating with others was apparent too (29%). Most importantly, HR learners were given opportunities to take actions to apply what they have learned into their workplace practices (11%), as compared with healthcare (5%) and WSH learners (6%), unlike the other courses covered in this study.

The following excerpts from the learner transcripts of the HR course are presented to show how the HR learners were making sense of the course in the deepest way, as described in Figure 5. In the HR management course, learners experienced the highest level of sense-making.

> During the course, we had quite a lot of speakers from the public service division, so they came to share on different things, **like the chief HRO shared on how the landscape is changing**, and then as a HR practitioner, how our roles are changing. Traditionally, people look at HR more of an administrative, support function, but going forward, **the trend that has been happening is, they are looking at HR as a change agent, as a business partner at the same time, as a strategic partner at the same time.** So there are a lot of roles that HR is expected to play, to take on in the future, which was actually quite nicely shared with us and help us in a sense to prepare for that thinking. Then, with the new different technologies like automation and all these, so what is the role that HR is supposed to play. Then if you are talking about all these technologies that organisations are pushing out, the fourth industrial revolution, how can HR bring value to this wave of change? So we must be at the frontier of it, that

means to do so, we must be the ones who are able to embrace this change, and probably pilot some of these changes at our own offices before we can ask the rest of the organisations to adopt this change. (Wilkie, Learner from HR course)

The sharing by Wilkie above revealed that he gained a holistic and systemic understanding of the future expectations and roles of HR professionals. By attending the sharing sessions conducted by industry experts from public sectors, he realised that a HR professional's future role was beyond just doing administrative work; rather, it involved many different roles in order to adapt to the future trend of work. Specifically, HR may need to assume a frontier role to initiate the changes in the future of work. Such a trend was inevitable for future HR professionals, going beyond common HR practices in certain companies. Guest speakers contributed to Wilkie's ability to develop a more systemic understanding of the HR role. Wilkie also valued the dialogic approach used in this course, as shown in the excerpt below.

> **Mainly for this course, I realised that the learning is in a sense two-way. The lecturer, actually I wouldn't call them lecturers. They were more like facilitators. So they facilitate the discussion.** It comes with their experience, what they have learned before, and what are the work experiences that they can share with us… **certain perspectives, and then from our perspective, we are able to contribute. And then bounce off the sharing from there. It is actually quite useful because the perspective that we have may be very different, and then a lot of us come from different government agencies, so the backgrounds that we have are also quite different and the cases that we manage are also quite useful.** So that has been very helpful. (Wilkie, Learner from HR course)

Dialogic interactions were not only between the facilitators and the learners, but also between the learners as peers. All the learners in this course were from different government agencies with different working backgrounds within their own agencies. By interacting with facilitators and peers, Wilkie realised that such communication or conversations turned out to be very helpful in terms of sharing the different perspectives on HR practices. Such communication gave him a more holistic view towards HR roles by enriching and broadening his understanding of standard HR practices in different government agencies. Pedagogical practices and learner agency to initiate such communication in the learning process was quite crucial. The above example revealed clearly that the adult educator in this course assumed a role more like a facilitator, rather than an authoritative lecturer dominating the classroom interaction with predetermined answers. At the same time, learners themselves also needed to take the initiative (and feel they have the power and opportunities to do so) for the sharing of different HR practices in order to reach a broader and more holistic understanding.

In addition to the above features of sense-making process (connecting, conceiving and communicating), the HR course also provided quite good opportunities for the learners to link what they have learned in the classroom with their workplace practices by doing a final project to address their real work issues (taking actions) as shown in the following excerpt.

> So for my project, I'm actually doing HR analytics. When you talk about HR analytics itself, it's that we want to have an understanding of the profile of the organisation. So like for example in my company, we have like 2 000-over staff. So we want to have a

better understanding of what's the age group, what's the length of service, what is the gender, is there a trend that we are looking at? Even like when they… You may even be able to drill down to the number of MC they have taken throughout the year and so on, to examine whether there are certain patterns. **Then it's that…because when you take a look from analytics perspective, that it comes with a diagnostic, descriptive. Then what you can actually use such analysis for is to help you to be able to make certain decisions.** Because in the past, when people talk about the way HR makes decisions, it's like this…not really being supported by the data. Ah, but if you see the trend nowadays for HR movement, is we have gone big into like big data. We want to make more data-driven decisions. (Maisy, Learner from HR course)

At the time of interview, Maisy was at the stage of conceptualising the project. The process of conceptualisation by Maisy revealed that she was trying to use data analytics to analyse HR data that she had in her organisation in order to inform the HR decision-making in her own organisation. She predicted what kind of analysis she could do with her own data and what kind of information she would like to gain from the data analysis. The final project was also part of the assessment for the course. Such a design element in the HR course helped learners make connections between theory and practice effectively to take appropriate actions to apply such analysis to make changes in the organisations.

What appeared to be important in enabling the deepest sense-making was the access to experiences that immersed learners in the complexities of the work they are learning about, be it through guest speakers, their own work issues that they base their capstone project on, or complex simulated experiences that are linked to real work experiences of these learners. Another important element in the deepest sense-making was the dialogic nature in the delivery of this course. The broad reasons for the deepest sense-making process will be illustrated in Chapter Four.

3.5 Conclusion

Sense-making is fundamental because it is the primary means where holistic meanings are manifested into applicable understandings. These understandings have the potential to inform action and develop professional identities. The seemingly transitory nature of sense-making belies its central role in the determination of human behaviour and actions whether people are acting in formal organisations or elsewhere (Weick et al., 2005).

The findings revealed that the distribution of the different features of sense-making contributes to the different kinds of quality of sense-making processes – limited, strong, deep and the deepest. Chapter Four will discuss the possible reasons for the different kinds of quality of learners' sense-making in a broader context. The contexts include three aspects: industry context, TAE context, and curriculum design and pedagogical practices.

4. Adult Learners' Experiences of Blended Learning

Learners' sense-making is complex. They do not make sense of their learning experience in isolation, but with others in a context where they interact with various affordances of technology, artefacts and tools. Within the context, learners need to sense-make to develop better understanding and know how they can put this understanding into action. Hence, it is important to recognise the possible factors that may influence or mediate learners' sense-making experiences.

Analysis of the transcripts suggested that the quality of learners' sense-making was influenced by the curriculum design and pedagogy developed and adopted in BL, resulting in limited, strong, deep or the deepest sense-making. Furthermore, our data analysis highlighted that the structuring of the "blend" and the design of learning result in either fragmented or seamless experiences for learners (as shown in Figure 6 on the next page). Limited sense-making was associated with fragmented design and learning experiences; deep sense-making was associated with design of BL that is seamless, creating a "joined-up" sense-making experience for learners.

For example, the fragmented sense-making experience reflected curriculum dominated by administrative decision-making; usually shaped by business decisions rather than a focus on enhancing sense-making and meeting learners' needs. A fragmented curriculum may:

- lack a coherent narrative across the different learning environments;
- focus on content as reproduction of knowledge, rather than critique and co-production of knowledge;
- contain learning activities that lack authenticity (i.e. that do not reflect the complexities of the work and work settings)
- have limited scaffolding of learning, contributing to disrupted authentic experience, e.g. when the workplace experience is not well integrated with classroom learning;
- have theory separated from practice; and
- fail to develop deep understanding.

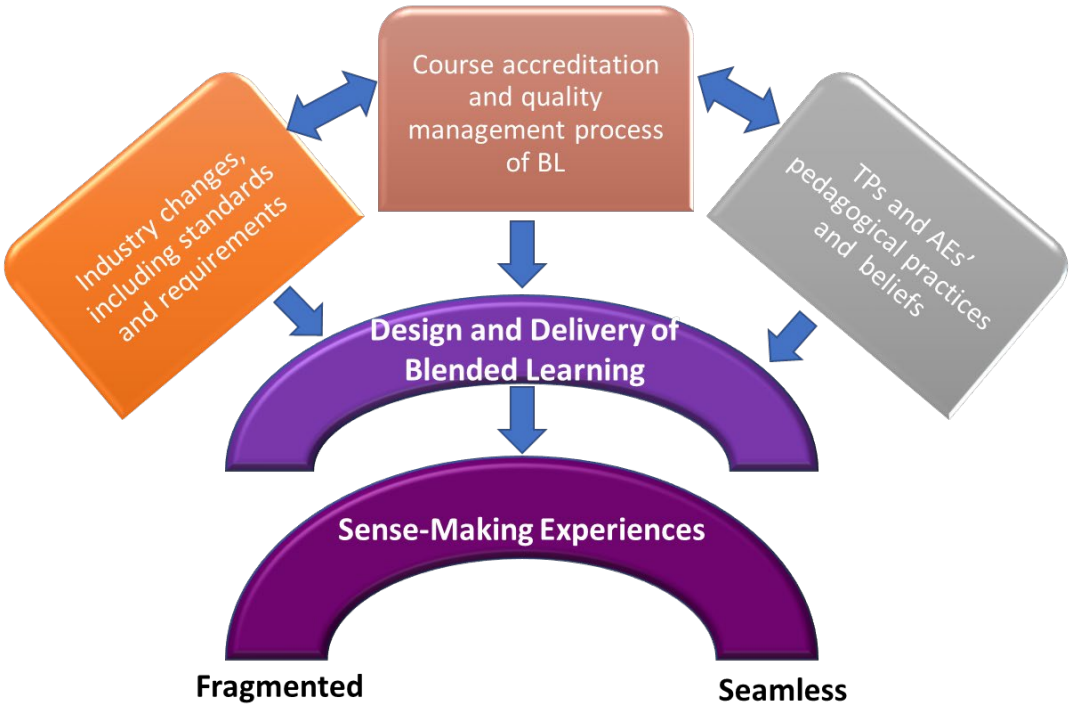
In contrast, a seamless curriculum may include:

- learning activities that present learners with authentic tasks, settings, interactions, etc, and a degree of choice in their learning opportunities for dialogue;
- consistency and alignment between aims, outcomes, learning activities and assessment (Bound et al., 2016);
- a coherent and clear narrative to facilitate effective sense-making with provision of appropriate scaffolding and authentic scenarios and tasks;
- opportunities for dialogue and co-construction of knowledge that are fundamental to the curriculum design and to facilitation (Bound et al., 2019);
- supportive technology for sense-making in and across the classroom and workplace and back again;
- iterative movement between classrooms, online platforms and workplaces with related and authentic activities; and

- holistic design integrating theory and practice, technical and generic capabilities (Bound et al., 2016).

The data analysis also revealed that the curriculum design and pedagogical practices were shaped and influenced by two intersecting contexts: industry context in which the courses of study were situated and the TAE sector arrangements. Figure 6 shows that the industry and TAE contexts worked together to impact directly on the curriculum design and pedagogical orientations of BL. In turn, these orientations may create different sense-making experiences for the learners in the different courses in the present study.

Figure 6: Conceptual framework applied to the case studies



Note: AE stands for Adult Educators; TP stands for Training Providers.

Please note that not all the contexts (e.g. Industry and TAE, pedagogical beliefs or practices) as shown in Figure 6 are present in each case study that will be discussed in this chapter. Some of them are more salient in certain case studies than others. The following sections will elaborate on how this conceptual frame is manifested in different case studies in the present study.

4.1 Fragmented curriculum design, pedagogies and sense-making experience in blended learning

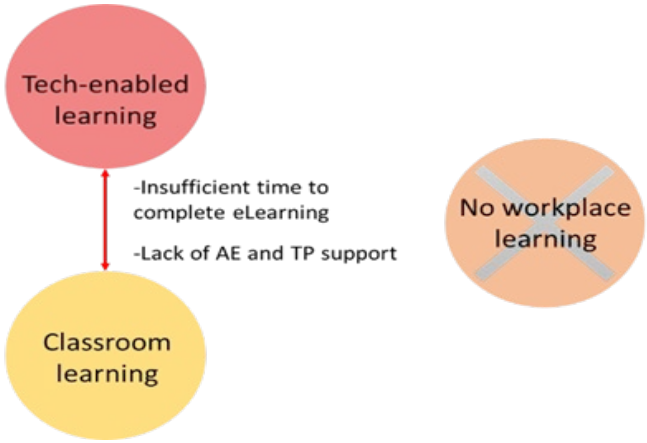
This section discusses how the fragmented sense-making experiences of learners from ICT and healthcare courses are affected by the curriculum design and pedagogical practices shaped by the interaction between industry and TAE contexts.

4.1.1 Fragmented sense-making (ICT)

As described in Section 3.1, the adult learners in the ICT course experienced a low level of sense-making as they spent most of their time noticing differences, recalling past experience and making comparisons. They seldom connected theory with practice, or conceived a systemic understanding of the software and the possibilities it offered. Also, they had limited, if any, application of what they learned to potential workplace practices. Such a sense-making process tends to be fragmented because the learners stopped at identifying and comparing differences in theory and practices and recalling past experiences. Learners' comments indicate that these sense-making processes were not sufficient for the learners to translate their learning into their workplaces.

The low level sense-making experienced by ICT learners might be due mainly to the fragmented curriculum design of this ICT course. In this course, the learners attended classroom (20%) and e-learning (80%) sessions involving both theoretical and practical knowledge. However, at the end of the course, the learners shared that they still lacked the competence to apply for relevant jobs. What was taught in the course did not incorporate the versatility of the SAP system and the ways in which it can be applied differently in different settings. Instead, the course design and facilitation were very prescriptive where learners had to strictly follow the procedural steps. Consequently, there was no opportunity to develop a deep understanding of the possibilities for the deployment of SAP system in a company, which was the promised learning outcomes at the end of the course. Learners reported instead that they could only be a user, and could not operate at the higher level of a consultant. They explained that the curriculum content was not adequate to meet most employers' needs and requirements in the industry. They strongly recommended that some embedded workplace hands-on learning in between classroom learning and e-learning was necessary to help them achieve a holistic understanding of the deploying SAP ERP system and be more competent and confident in applying for related jobs. Additionally, there appeared to be limited opportunity for learners to engage in purposeful dialogue. Figure 7 represents the overall sense-making experience of ICT learners of this BL course.

Figure 7: ICT learners' sense-making experience in blended learning



The lack of clarity on the purpose of using BL is a contributing factor to the fragmented sense-making experience of learners and of their limited sense-making opportunities. At the time of data collection for this course, it had been run by the training provider for six years, though BL had been in place for only six months. Before this, the course was delivered purely by classroom teaching over a nine-month period. The change to BL was the training provider's response to policy changes; namely, the government initiative to incorporate BL in all full-qualification WSQ courses by January 2017 in order to maintain the training provider's training subsidy. However, the change appeared to have failed to take learners' needs and capability development into consideration and in aligning their own infrastructure and manpower readiness to the change.

The second reason for the learner's fragmented sense-making experience in this course was related to WSQ's strict competency requirements. A key feature of the curriculum design was the mapping of the SAP course materials provided by the vendor, with competency requirements. The primary focus on content, rather than attention to the purpose and learning outcomes of the course and how they relate to the content, appears to have contributed to a highly mechanistic design that fails to build in more sense-making opportunities.

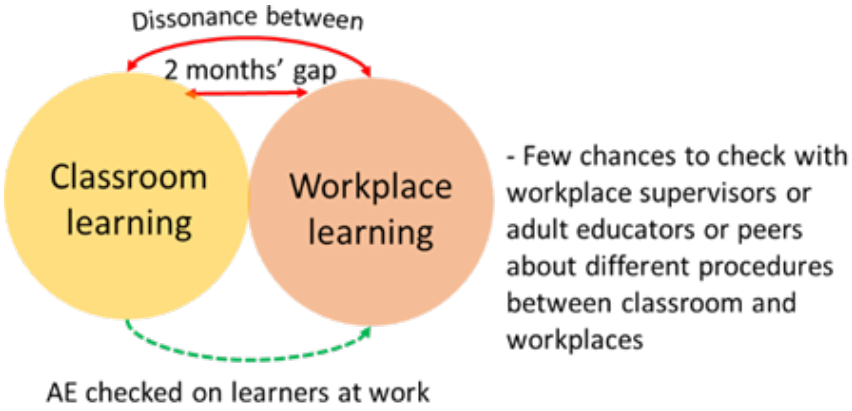
4.1.2 Less fragmented experience (Healthcare: Therapy Support and Optometry courses)

As described in Section 3.2, the adult learners in both healthcare courses experienced strong sense-making as compared with ICT learners, because they were provided with more opportunities to make connections between theory and practice and conceive a more systemic understanding of the industry through authentic practical sessions and workplace learning, in addition to opportunities for noticing, recalling and labelling. Though both courses had a long tradition of using BL, learners' sense-making experience still tended to be somewhat fragmented mainly due to the curriculum design of the courses.

The Therapy Support course placed the workplace attachment at the end of two months' classroom teaching. The learners found that some techniques and procedures they learned during the workplace attachment were different from what was covered during their classroom learning. They also found that each of the workplaces they were attached to had

different procedures, and this created further confusion and inhibited their sense-making experiences. There was little they could do to address this dissonance in their sense-making with the adult educators, as the adult educators visited them only once during their four weeks' clinical attachment. The learners were not required to return to the classroom after the attachment to give feedback, share and discuss their workplace experiences to deepen their sense-making collectively. In addition, learners found that during the workplace attachment, there were few opportunities for them to communicate with their workplace supervisor about the different techniques and procedures encountered due to the workplace supervisor's busy working schedule. Figure 8 captures learners' sense-making experience in this healthcare course.

Figure 8: Therapy Support learners' sense-making experience in blended learning



The above fragmented sense-making experience of Therapy Support learners was mainly caused by the following reasons. Firstly, the perception of the training provider was that there was no opportunity to update the curriculum content (10 years old at the time of data collection) and that the accreditation body also required the practicum to be placed at the end of the classroom experience. The placement of the clinical attachment at the end of the classroom learning means a long gap between what happens in the classroom and practice spaces and the opportunity to apply what was taught at workplaces. The relevancy of the content in the curriculum was also greatly limited by the highly prescribed competency standards, deemed and understood as necessary at the time of accreditation about 10 years ago. Even though the curriculum designer put in a lot of effort to improve the currency of the curriculum content by consulting with industry practitioners, in response to the rapid evolvement of practices and technology in the healthcare industry, the training provider explained that these updates were not part of the curriculum which needed to pass the auditing process by an accreditation agency. The belief on the part of the training provider that they could not change what they described as outdated and irrelevant in order to pass auditing processes, is in fact at odds with the agency's requirements at the time of data collection. There is a tension here between the mapping to outdated competency standards and curriculum design decisions. This likely explains why the learners noticed a lot of differences in the technique and procedures between the classroom and workplaces. Secondly, the training provider's manpower constraints and challenges in establishing partnership with the industry could be another reason causing the somewhat fragmented sense-making experience of therapy support learners. For this course, most of the adult educators were working part-time with the training providers. They spend most of their time running their own business outside the school. Only full-time adult educators

were assigned to make visits at workplaces to check on the learners' progress and performance. The number of full-time adult educators for this course was not sufficient to cover all the workplaces the learners were assigned to, which resulted in an adult educator only visiting each workplace once for a short period of time. During the visit, the adult educator may not be able to talk to each of the learners in detail on their challenges and feedback. The limited communication between the learners and the adult educators during attachment may also contribute to learners' confusion in translating their learning from classroom to practice. For example, there were no other channels and platforms for learners to share their experiences, ask one another questions, or ask their adult educators questions during and after the attachment. In addition, the data indicated that the workplace supervisor may not be able to provide the level of desired support as their daily working schedule was too tight to give guidance. This is an aspect of partnerships and expected roles and support from each of the partners – the workplace and the training provider – that needs attention and possibly capability development.

However, when we compared the sense-making experience between ICT and Therapy Support learners, we found that the sense-making experience of Therapy Support learners was less fragmented than that of ICT learners. Besides the workplace attachment, the difference was mainly due to the pedagogical practices employed by adult educators during classroom teaching. Adult educators in the course adopted a lot of role-play activities, case studies, hands-on practical sessions and formative assessment to facilitate learners making connections between theory and practice. Learners experienced simulated scenarios and improved their practices before entering the attachment. Even though the learners still felt a strong culture shock in the workplace attachment, such pedagogical practices did help the learners fill some of the gaps between theory and practice, making their sense-making less fragmented than that of the ICT learners.

The Optometry course was a part-time course for students with full-time jobs. This was a non-accredited course run by the training provider for about 10 years. As a non-WSQ course, the training provider had more freedom to design and deliver the course as it deems fit. Workplace learning took place at each learner's own workplace after classroom sessions in school. In school, classroom learning was conducted by adult educators, and lab practical sessions were conducted by industry practitioners. However, the interviews from learners, adult educators and workplace supervisors revealed that there was a lack of communication among the three parties, and they did not keep one another informed on the progress of learners in the course. The workplace supervisor understood their role as ensuring that the learners can tick the log book brought from school to the workplace. Workplace supervisors seldom discussed with the learners and adult educators what was learned in school, in order to better facilitate and connect for seamless learning. Adult educators visited the learners two to three times during the 10 months' programme to check whether the learners had done the cases in the log book. As revealed in Chapter Three, there was not much communication between the adult educators conducting classroom teaching and those conducting laboratory sessions.

Two reasons for such fragmented sense-making processes are explored. Firstly, the curriculum design of the course followed the industry standards closely to create the career pathway for the learners to meet industry growth and demand. This was a potential contributing enabler to deep sense-making (as discussed in the following section). However,

the limited communication and collaboration between adult educators in the classroom and labs, and adult educators and workplace supervisors contributed to learners' sense-making process being rather fragmented. Learners had access to both classroom and workplace environments, but the assessment design did not support the linking of theory and practice, and there was limited scaffolding to assist learners to translate their learning across these environments. Even though the adult educator claimed that what they taught in the classroom and lab practical sessions were highly relevant to current industry demand, both the workplace supervisors and learners found that some of the theoretical knowledge learned was not so applicable to the workplace. Although this is a complaint that is universal, it is something that can be addressed and improved.

Another common complaint expressed by learners in this course was that the equipment that the workplace used was more up-to-date than what learners used in the school setting. One workplace supervisor shared that he did not know what the learners were supposed to learn in the school. When coming to complete the tasks as specified in the log book, he did the demonstration for his learners following the workplace common practices. In addition, there was no channel for workplace supervisors to feedback on what they perceived as being irrelevant and/or outdated content. When learners noticed the differences, they also tended to keep quiet and accept the fact, rather than posing questions about what they noticed. Due to the limited communication between adult educators and workplace supervisors, the sense-making of these learners in this course still tended to be fragmented, as the learners' need to make linkages between the classroom and workplaces was not considered as part of the curriculum design.

In addition to the curriculum design, the pedagogical practices adopted by the adult educators and workplace supervisors also contributed to learners' fragmented sense-making experience. During the observation of classroom teaching, practical sessions and workplace learning, it was found that learners tended to be the passive recipients of the knowledge and skills transmitted by adult educators or workplace supervisors. For example, in classroom teaching, there were no engaging activities to help learners deepen and translate the learning. In practical sessions, they had more hands-on practices with their partners, but they were using outdated equipment which the shop stopped using many years ago. At workplaces, the learners did what they were instructed to do by following the shop routine, but they had limited opportunity to challenge or make judgements to take actions to apply their learning. During our observations, we seldom saw learners raise any questions or initiate communication to clarify their doubts and ask for some support, indicating a classroom or school culture akin to applying the acquisition metaphor (Sfard, 1998) only. Such a sense-making experience created by these pedagogical practices tended to be fragmented, as learners were not scaffolded effectively to link what they have learned across these different learning environments.

To sum up, the constraints for seamless sense-making experiences, as shown in the above case studies, can be listed as follows:

- Lack of authentic workplace learning to enable learners to apply what they have learned in classrooms in the course;

- Outdated curriculum content and structure which does not connect with the current practices well;
- Manpower constraint to support learners during workplace learning to make better links between theory and practice;
- Limited communication between adult educators, and between adult educators and workplace supervisors on learners' progress and difficulties in overcoming the challenges in linking theory and practice; and
- Outdated equipment used in practical sessions, which hinders the application in practices.

The next section will discuss the case studies that tend to create a more seamless sense-making experiences for the learners.

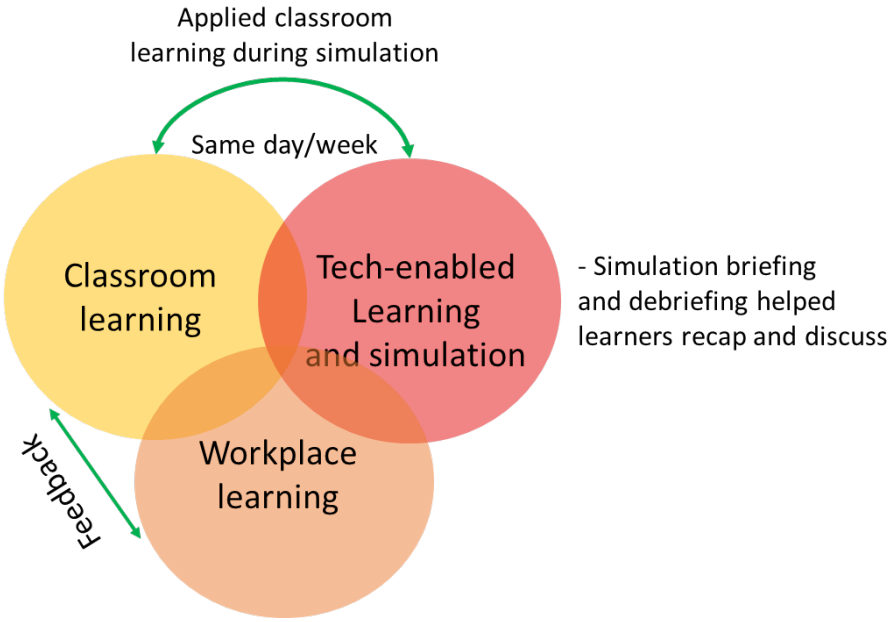
4.2 Seamless curriculum design, pedagogies and sense-making experience in blended learning

This section will discuss how the seamless sense-making is experienced by the learners from WSH and HR courses, which are affected through the curriculum design and pedagogical practices and shaped by the interaction between industry and TAE arrangements.

4.2.1 Moving towards a seamless sense-making experience (WSH: Construction and Maritime courses)

As described in Section 3.3, the adult learners in the WSH courses experienced strong sense-making, as compared with healthcare learners, because the former were provided with more opportunities to make connections between theory and practice and conceive a more systemic understanding of the industry through practical sessions and workplace learning. Such a sense-making experience tended to be seamless for these learners because they received plenty of opportunities and support to link and apply what they have learned across different learning environments. Both of the courses were non-WSQ courses and had been run by the respective training providers for more than 10 years. Again, curriculum design and pedagogical practices shaped by both industry context and TAE arrangement played an important role for the quality of learners' sense-making experience. The learners' sense-making experience in both WSH (Construction and Maritime) courses is illustrated in Figure 9.

Figure 9: WSH learners' sense-making experience in blended learning



The two WSH courses (Construction and Maritime) shared a few commonalities in the curriculum design and pedagogical practices. Firstly, both of the courses developed their curriculum in collaboration with industry authorities to meet their requirements for the job roles. The industry updated their requirements regularly and kept the training provider informed so that the training provider could incorporate these updates into their curriculum. For example, the WSH course in Construction followed the guidelines from the Building and Construction Authority (BCA), updating their curriculum content on erecting scaffolding to align with the changes made to the guidelines, and ensuring that the content to inform workplace practices was relevant. Since the training provider is also a scaffolding service provider, they regularly conducted in-house training for their own workers to meet the project specifications requested by the companies. Such in-house training was continuous and updated in order to prepare their own workers to meet the different requests by the different companies. The other WSH course in Maritime also developed the curriculum in close collaboration with Maritime Port Authority (MPA) and the International Maritime Organisation (IMO) to make sure the content is the most relevant and up-to-date. Additionally, MPA sent representatives to participate in the assessment processes to make sure that the learners were qualified. The close partnership between training providers and industry partners enabled the learners in these courses to experience a seamless sense-making, as the learners were able to link the theory and relevant practice easily. Therefore, they felt more confident in taking actions to apply what they have learned, as shared in Chapter Three.

Secondly, both of the courses integrated classroom and workplace learning by having the learners move back and forth across the different learning environments. Between such alternating sessions, the adult educators' and workplace supervisors gave feedback to each other frequently on the learners' progress and performance. For example, in the Construction course, the learners were assigned to a junior workplace supervisor, who was an ex-trainee of the same training provider, to guide them during their early days of working. After observing the strengths and weaknesses of performance of the learners, the workplace supervisor gave

his feedback to the adult educator, so that the adult educator could incorporate the feedback to improve the in-house training to better prepare future learners to avoid the same problems. Such communication between adult educators and workplace supervisors on a regular basis enabled each party to update their teaching and coaching. The ongoing communication between adult educators and workplace supervisors also contributed to the seamless sense-making for these learners as such communication can help the learners overcome challenges and clear doubts in application of theory into practice more easily.

Thirdly, the simulation sessions in these two courses took place immediately after the classroom teaching of theories. For the Maritime course, the simulator session took place within one week after the classroom teaching, while the simulation session of the Construction course took place immediately after the classroom teaching on the same day. In addition, learners in both courses were given a briefing before the simulation session to recap what they learned in the classroom. After completing the simulation session, the learners identified and addressed gaps in their knowledge as well as identified areas of improvement in a debrief session through a group discussion with their instructor as set out in the curriculum.

Lastly, during classroom teaching, the adult educators from both courses tried to broaden the content by bringing their own working experiences from the field and encourage the learners to share among themselves about different working experiences in their daily work. Such sharing deepened the learners' understanding of the links between theories and different scenarios of the workplace settings, which will benefit their workplace learning.

In summary, the close partnership between training providers and industry partners, the design of authentic activities and the dialogic delivery of the courses encouraging the sharing among learners worked together to ease the linking between theory and practice, and enabled more effective application of theory to practices for the learners, so as to create the seamless sense-making experience for these learners.

4.2.2 The most seamless sense-making experience (HR course)

As compared with other case studies, the HR BL course offered the most seamless sense-making experience for the adult learners. The course created the most opportunities for learners to contextualise their classroom learning to their workplaces. Again, such a seamless sense-making experience was created by the curriculum design and pedagogical practices shaped by the interactions between industry and TAE contexts. The HR learners' sense-making experience is depicted in Figure 10.

Figure 10: HR learners' sense-making experience in blended learning

The curriculum in this course was designed using a consistent narrative to form the backbone connecting and bridging different modules of the course. In addition, for each of the individual modules, there was a designated adult educator sitting through all the modules to link each module to the previous module as well as the module that came after the current one. Learners from different agencies sat together to share experiences, deepening their exposure to different HR practices. In addition, HR experts from both the public and private sectors were invited to conduct some sessions with rich industry examples and experiences in the course. More importantly, learners were required to select an issue in their own workplace and develop a project to address the issue. The linking of modules, access to industry experts, dialogue and interaction, authentic learning and assessment were important in helping learners make sense of HR practices from different perspectives.

One of the unique features of this HR course was that it deliberately allowed the HR professionals to mingle with the finance professionals to create communication between them and enable a better understanding of each other's daily practices. Finance professionals were from another course conducted by the training provider. This intentional aspect of curriculum design offered learners more exposure to what is happening at workplaces in order to prepare them for future challenges and industry transformation. One of the adult educators revealed that a need was rising in the corporate services for HR departments to move beyond being a supportive department dealing with administrative routines and backend work, to actively build collaboration with other departments related to resources, such as the finance department, in order to serve the common goal of the organisation. The learners shared in a very comparative way between HR and Finance practices which could facilitate better collaboration when they go back to their own organisations and have to work with such professionals. Such an understanding could also help the learners step out of the box of HR work as merely a supportive administrative process to instead nurture a growth mindset, which also affects other departments' work. Such a design of the BL represented the most authentic and current practices for HR professionals. By mingling with the financial professionals, these HR professionals would be able to foresee what will happen in a real work setting in connection with their own work settings (connecting), so that they would be prepared by the training to take appropriate actions (taking actions) if they encounter the same situation in their own work settings.

Besides the mingling of HR and finance professionals, the HR course curriculum also incorporated the IHRP (Institute for HR Professionals) certification for the learners. This certification is part of the HR professional requirements to certify more than 5 000 HR professionals by 2020. One of the learners shared his tough but useful experience in taking the exam. He shared that not only did he achieve certification during the course, he also got a chance to know more about HR practices in private sectors. He particularly mentioned the HR and Manpower acts. Such an inclusion naturally enabled the smooth and seamless translation between classroom learning and workplace practices. Therefore, the learner concluded that even though the exam was tough, it was a very useful learning experience for him.

Another important feature of the curriculum design was the incorporation of a workplace-related assignment for learners to solve their workplace issues by applying whatever they have learned from the course to solve a real issue at their own workplace. Such an assignment enabled the seamless sense-making because it enabled the learners to make connections between abstract theory and concrete practices (connecting). The example discussed in Chapter Three of using data analytics helped learners identify the gaps in their HR practices and make decisions on the kind of changes they can make at their own workplace. Such an assignment helped them revisit their own workplace issues in the more scientific way and make more informed decisions to enable the transformation in the HR industry to meet the needs for such transformation. As a result, learners' sense-making experience in this course tended to be more seamless, as compared with earlier examples, as they were able to use what they learned in the course to make immediate application and take appropriate actions to address the issues at their workplace (taking actions). There was a clear purpose in the design and structuring of the course to help learners gain a deep understanding and make a seamless application of the current HR industry trends and practices in this BL.

Besides taking into consideration learners' needs in their curriculum design, the training provider's belief about learning (embodied in the adult educator's pedagogical practices and training provider's learning facilities) also played a role in shaping the learners' sense-making experience. The sharing from the adult educator in this course revealed that the training provider's belief in participative learning embodied in the classroom setting tended to enable the seamless sense-making for the learners. Such a belief would strengthen the communicative and collective nature of sense-making, which is one of the important features for seamless sense-making. In order to create the most participative and collaborative sense-making experience in this course, the training provider undertook visits to a few educational institutions in Singapore, e.g. INSEAD, NUS and NTU, to learn from them how to design conducive facilities to enhance learners' sense-making experience by adopting technologies.

The training provider's beliefs in participative learning in this HR course were also strongly represented in the pedagogies of the course. One of the adult educators shared that he first had to establish his role in the classroom as a facilitator, rather than an expert. This move signalled to the learners that they had to share and learn from one another based on their own rich experiences, which were highly workplace-related and authentic, by which the learners were then able to contextualise and link what they had learned in the course with their workplaces and made more seamless transition and application between the classroom and workplaces. Such a belief in learning and intended pedagogies benefited learners' sense-making experience in this course. One of the learners shared that such active participation in

learning with highly authentic case scenarios reminded her of the daily HR routine of dealing with different colleagues in the organisation. At the same time, this created an authentic learning environment for her to move seamlessly between classroom discussion and workplace communication.

In summary, the enablers for a seamless sense-making experience are listed below based on the findings from the above case studies:

- Strong partnership between training providers and industry partners, e.g. jointly developing the curriculum, ongoing updates of the curriculum keeping abreast of industry standards and changes, industry experts involved in the teaching and assessment of the course, so that learners could be able to link classroom learning and workplace practices more smoothly;
- Design authentic assessment tasks, e.g. how the learning can address the learners' workplace issues, so that they can take immediate actions to apply to and solve realistic issues;
- Reinforce learners' retention and application of the knowledge and skills by facilitating practical/hands-on/simulation sessions after classroom learning, so that the connection between theory and practices could be enhanced;
- Encourage adult educators to share their real-life industry experiences during teaching to help the learners to contextualise the theory as much as possible in classroom settings so that learners can build connection between theory and practice more easily in their sense-making; and
- Designing workplace-related assignment to help learners make timely application to realise seamless sense-making.

This study revealed how industry context (e.g. the involvement of industry partner, updated industry standards in the curriculum) and TAE arrangement (e.g. accreditation and regulations of the course, adult educator and training provider's beliefs in learning) contributed to the curriculum design and the pedagogies developed and adopted in the course. This is on top of taking into consideration learners' needs in BL. A good alignment among these factors tended to better enable a more seamless sense-making experience for the learners.

4.3 Conclusion

This chapter presents the findings on the possible direct and indirect factors affecting the quality of adult learners' sense-making in the six case studies: directly, curriculum design of and pedagogies used in BL; indirectly, the interactions of industry ecology and TAE ecology that impact curriculum design and pedagogies, which in turn affect the quality of learners' sense-making. Chapter Five will summarise the main findings of the present study in the sequence of research questions. Following the summary, some practical recommendations will be made for relevant stakeholders to consider and adopt.

5. Implications for Pedagogical Innovations and Curriculum Design of Blended Learning

This chapter will first summarise the findings of the study according to the three research questions. Drawing on the summary of the findings, the authors will propose some recommendations for different stakeholders on how to improve the design and delivery of BL to enable a more seamless sense-making for adult learners.

A recap of the research questions is listed below:

RQ1: How do adult learners make sense of and translate their learning across different blended environments and apply to their work?

RQ2: How do adult learners experience learning in and across different blended environments?

RQ3: What are the implications of the findings from RQ1 and RQ2 for pedagogical innovation in BL?

5.1 Summary of the findings of the present study

Sense-making across different learning environments (RQ1)

Chapter Three provides the findings to RQ1 in terms of the quality of adult learners' sense-making by unpacking their sense-making into seven different features: noticing, recalling, labelling, communicating, conceiving, connecting, and taking actions. By showing the distribution of these different features of sense-making, the present study is able to depict the quality and level of sense-making experienced by the adult learners in different BL courses. These sense-making features are present in an ongoing, dynamic and iterative way, as shown in Figure 1 (p. 23 of this report). The learners tend to experience limited sense-making if they are mainly recalling their past experiences, noticing the differences between classroom learning and workplace practices and between their past and current experiences, and comparing and categorising these differences. Learners were not provided much opportunity to make effective connections between theory and practice and conceive a systemic and holistic picture of the job roles at workplaces. Without authentic tasks designed into BL, the learners strongly felt they were not competent to take on the new role at workplaces.

Going beyond recalling, noticing and categorising the differences, if the learners are given more opportunities to make connection between theory and practice and even apply what they have learned in classroom to workplaces, adult learners tend to experience a strong sense-making experience. However, such a strong sense-making experience could be further enhanced if adult educators and workplace supervisors, training providers and employers could strengthen their partnership and communication to provide facilitation in between

different learning environments in BL to better enable the connection and application for the learners.

Learners tend to experience deep sense-making if they are provided timely opportunities to make authentic application to related workplaces, with the constant facilitation from adult educators and workplace supervisors who are familiar with the content in the curriculum of BL. With deep sense-making, learners would be much more competent and confident to assume new roles at workplaces by being equipped with the holistic and systemic understanding of the job roles and requirements and the most authentic hand-on application at workplaces.

The subsequent section will give some possible reasons behind the different kinds of quality of sense-making experienced by the learners from these courses.

Adult learners' experience of blended learning (RQ2)

Drawing on the different kinds of quality of sense-making, Chapter Four seeks to reveal the causes behind the different kinds of quality of sense-making experienced by the learners. The first layer looks into the curriculum design and pedagogy of BL, and the second layer at the industry and TAE requirements and arrangements, which shape the curriculum design and pedagogy and the quality of sense-making experience.

The fragmented sense-making experienced by ICT learners reveals the importance of incorporating authentic learning tasks in BL. Without such authentic tasks, learners face difficulty in contextualising the classroom learning into workplace practices. For example, given the fast-paced changes in the IT industry, contextualisation through making links between theory and practice, and application to real scenarios is crucial for a better sense-making experience. The less limited and less fragmented sense-making experienced by the healthcare learners demonstrates how important the close collaboration between training providers and employers is in designing authentic tasks. Simply incorporating authentic tasks in BL may not be able to enhance learners' sense-making experience. Without constructive collaboration between training providers and employers in designing authentic tasks, the healthcare learners may still be a bit lost in their sense-making due to the outdated curriculum content and design and lack of support from adult educators and workplace supervisors.

A more seamless sense-making was experienced by WSH learners because of the close collaboration between training providers and industry partners in developing, updating and implementing the curriculum. This close collaboration helps the learners overcome the challenges they may face in linking classroom learning and workplace practices, as the curriculum is highly reflective of the current industry requirements. In addition, the frequent communication between adult educators and workplace supervisors on the learners' progress and performance also enhanced the learners' sense-making by facilitating them to perceive a more holistic understanding of the job roles they need to assume and the expectation of the job roles by industry. Another important contributor to this more seamless sense-making experience is the design of timely and sandwiched authentic tasks for learners to move back and forth between theories and practices in order to reinforce the connections and also provide more chances for them to take informed actions on how to make appropriate application.

The most seamless sense-making was experienced by the HR learners in the present study. Besides all the contributors for seamless sense-making as discussed above, some

other unique contributors are salient in this course to make the most seamless sense-making for the HR learners. Firstly, in delivering the course, the involvement of the industry practices and experts to conduct some sessions further enhanced the learners' sense-making because the learners were able to strengthen and confirm their understanding of the connection between theory and practice so as to inform their actions to make application. Such high authenticity, as embedded in this course, meant that learning outcomes were successfully met. More importantly, the HR learners were empowered to select the most relevant work-related issues from their workplaces to initiate the application of classroom learning. Upon the completion of such purely authentic tasks, the learners were ready to bring about changes in their own workplace practices. This is an important outcome of seamless sense-making. For adult training courses, adult educators may need to constantly reflect on their pedagogical practices, particularly on their role in delivering the course. Adult educators may not always be the only experts in the classroom. Therefore, the sharing among learners themselves should be encouraged to expose them to different authentic practices, perspectives and experiences, contributing to systemic understanding. The HR learners shared that they benefited greatly from such sharing, which is sometimes even more useful than the designed authentic tasks.

Drawing on the discussion of the findings, Section 5.2 will propose some practical recommendations for different groups of stakeholders, including adult educators in the role of facilitators, curriculum designers, training providers, accreditation bodies of BL courses, and industry partners. These recommendations also respond to RQ3 at the same time.

5.2 Recommendations from the findings

This section proposes some recommendations for different groups of stakeholders in BL based on the findings of the present study to improve the design, delivery and quality assurance of BL courses. The stakeholders discussed in the present study are categorised as follows:

1. Stakeholders directly involved in designing and delivering BL, e.g adult educators, curriculum designers, training providers and industry partners.

2. Stakeholders indirectly involved in BL, e.g. quality assurance of the BL courses, IAL (the body responsible for training and professionalisation of CET sector), accreditation bodies.

5.2.1 Direct stakeholders

Training providers in blended learning

Training providers are pivotal in coordinating the different stakeholders in designing and delivering BL. They engage curriculum designers and adult educators to design and deliver BL for the enrolled learners. They need to provide the infrastructure and technical support if there is tech-enabled learning. In addition, they need to liaise with industry partners if there is workplace learning in BL. They also need to respond to policy changes to survive in the market. As a result, training providers may be one of the most important players to influence learners' sense-making in BL. Specifically, to enable the seamless sense-making experience for learners, training providers may need to consider the following:

1. Establish constructive interactions among learners, curriculum designers, adult educators and industry partners to understand one another better for enhancing the learners' sense-making experience;

2. Use a team approach to design BL requiring the team (curriculum designers, adult educators and industry partners) to meet often to secure a consistent narrative and clear connection between and across different modules and/or module components and materials; and

3. Pay freelance adult educators extra hours to develop the consistent narratives across the modules.

If training providers take the above recommendations into consideration, the adult educators, curriculum designers and industry partners may consider the following recommendations in designing and delivering BL to enable seamless sense-making for the learners.

Adult educators and curriculum designers in blended learning

Adult educators are the executors in delivering the BL. As revealed in the findings, learners tend to experience seamless sense-making if they are offered more opportunities to share ideas, gain different perspectives from others and are exposed to different authentic tasks and settings. In addition, the curriculum design of BL plays a significant role in adult learners' sense-making experiences. How the different components of BL are structured for each course results in different sense-making experience for the learners, and the industry experiences of curriculum designers may also influence the relevance of the curriculum to industry standards. Last but not least, learners' seamless sense-making in BL requires the most attention from curriculum designers. To enable curriculum design and delivery of BL that supports deep and seamless sense-making, adult educators and curriculum designers may consider to:

1. promote communication between adult educators and workplace supervisors on the platforms built up by training providers and employers to:
    a. share and obtain input into course design and facilitation; and

b. discuss learners' progress and performance in order to offer timely and relevant support;

2. instead of monologic pedagogy, design and use a dialogic pedagogy (Bound et al., 2019) where learners are encouraged to share their experiences to learn from one another, be exposed to different perspectives, deliberately link theory and practice, use authentic experiences, and be empowered to drive their learning, including their learning capabilities;

3. keep up-to-date with industry developments and incorporate them regularly into the curriculum and bring into classrooms;

4. prioritise learners' needs in designing BL by:

    - developing consistent narratives across different modules in the course;

    - deliberately selecting specific modes of BL (classroom, workplace, tech-enabled) that best meet the learning outcomes; and

    - designing activities to enable the most seamless sense-making experience for learners and at the higher levels (e.g. authentic experiences that reflect the complexities of work, interaction between peers, using a dialogical approach, highly work-related tasks). See for example, *The Guide for Six Principles of Learning Design* (Bound & Chia, 2020).

5. implement assessment as or for learning (see for example, Bound, Chia & Karmel, 2016).

Industry partners in blended learning

How industry partners work together with training providers emerges as an important aspect of BL. As revealed in the findings in the present study, the deeper the industry partners are involved in the design and delivery of BL, the more seamless is the adult learners' sense-making experience. Particularly, industry partners can consider establishing closer collaboration with accreditation bodies and training providers in designing and delivering BL by:

- providing the most updated and relevant skills/capabilities and job requirements for them to incorporate into course content if required by training providers;

- offering more accessible and facilitative workplace learning to the learners, if required by training providers; and

- playing a positive role in working with training providers to train the learners to become professionals that the industry needs by initiating feedback sessions on how to enhance the training.

5.2.2 Indirect stakeholders

In training and developing adult educators, IAL also plays a role in ensuring the adult educators and curriculum designers have the skills and capacity to facilitate the seamless sense-making of adult learners in their learning. To do so, some recommendations are offered below:

1. Provide professional support for and interventions to adult educators, particularly freelance adult educators and curriculum designers, to raise their ability to shape the quality of learners' sense-making experience in BL through sound pedagogical practices; and

2. Meet training providers' Continuing Professional Development (CPD) needs to enhance seamless sense-making in BL; e.g. stakeholder engagement and relation building, managing and overseeing curriculum design, quality systems and processes for curriculum design, feedback loops and adult educators' engagement, etc.

Accreditation bodies for blended learning

Last but not least, as implied from the findings of the present study, accreditation bodies can also play a supportive role in developing appropriate guidelines to create a seamless sense-making experience for adult learners. Some recommendations are proposed below:

1. Gather meaningful and clean data about BL through:

    - having clear definitions of terms (e.g. classroom, practical sessions, on-the-job training, tech-enabled learning, workplace learning) to facilitate compliance with their requirements;

    - being more specific in accreditation criteria to ensure the quality of the course, e.g. how the integration between the different learning components is achieved; how theory is linked to practice in the course; what communication channels are available between learners, workplace supervisors and adult educators; how classroom learning is linked to actual workplace issues and challenges; who will conduct practical sessions, and when and where they are conducted; how the different components of BL are structured in the course to achieve the learning outcome; who the industry partners for BL are, and how they are involved, etc.

2. Allow training providers flexibility to update curriculum continuously and require monitoring and evaluating based on feedback from various sources, e.g. industry, adult educators, Training Quality and Outcomes Measurement (TRAQOM), and making needed adjustments.

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