

Sync or Async: Charting the Course for Engagement in Adult Education

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Abstract

Adult education often offers both asynchronous and synchronous modes of online learning to provide flexibility for learners. However, there is a limited understanding of engagement in these modes within adult education. This study aims to explore how the behavioural, cognitive, emotional, and social dimensions of engagement are facilitated in asynchronous and synchronous modes. A mixed-methods approach was used, involving observations and interviews with a total of 33 participants, conducted between April and December 2021. The study examined both Asynchronous Distance Education (ADE) and Synchronous Distance Education (SDE) classes. The findings indicate a significant correlation between the mode of delivery and how engagement is facilitated. ADE designs exhibited a wider variety of engagement facilitation compared to SDE. Furthermore, specific engagement dimensions were found to be more prominently supported in either ADE or SDE classes. To address the one-sided focus on engagement in each mode, teachers should actively design learning activities that promote varied ways for learners to engage in the learning process. This development is crucial as one-sided engagement, particularly in assimilative learning, has been associated with lower academic performance.

Keywords: Adult Education, Synchronous, Asynchronous, Engagement, Second Language Learning

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Introduction

The leap in educational digitalisation has led to an uptake of online educational modes, in adult education, where the previous traditional means of distribution are being challenged. Distance education has traditionally been associated with low levels of interactivity (e.g., Greener, 2021). However, functions in digital technologies that enable interaction (e.g., communication, collaboration) across synchronous and asynchronous modes of education are currently being adopted (Bergdahl, 2022b; Greener, 2021; Watts, 2016), which may indicate a shift in how distance education will be delivered (with a potential increase of synchronous elements). When technologies and conditions for education change, the designs of learning activities must follow, as digital technologies, and uses of them, influence how learners engage (Bergdahl & Bond, 2021; Engle and Conant, 2002; Mejia, 2020; Vuopala, Hyvönen and Eagle, 2014). As an example, collaboration may spur engagement, but uneven participation in collaboration can be linked back to poor designs (Vuopala, Hyvönen and Eagle, 2014). Thus, teachers need to consider the type of interactivity and how their design supports engagement in learning in both synchronous and asynchronous modes of teaching. While teachers are designers of learning activities (e.g., Goodyear and Dimitriadis, 2013; Laurillard, 2012), they may find it challenging to design engaging learning activities in digital learning environments (Dalgarno, 2014). There is a general call for research to identify strategies to increase learner engagement, particularly in distance (Samson, 2020) and adult education (Swedish Institute for Educational Research, 2019) and a particular call to explore how dimensions of engagement in online learning environments (Hu and Li, 2017) that is subject-specific (Fredricks et al 2016). Responding to this gap in existing research is a comparison on how engagement is facilitated in synchronous and asynchronous modes, in Swedish and English second language (L2) learning for adults.

To contribute with insights in this regard, this study raises the research question: How are learners' behavioural, cognitive, emotional, and social engagement supported in asynchronous and synchronous learning designs in L2 adult education?

Background

Synchronous and Asynchronous Modes of Online Delivery

Distance learning is common in both higher education (Watts, 2016) and adult education (Zigerell, 1984). Parallel, with the demand to offer flexible education to adult learners, to promote lifelong learning, schools are seeking alternative ways of educational delivery. Following Pullen (1996) we use the term synchronous distance education (SDE) when addressing education in real-time mediated via video-conferencing systems and Learning Management Systems (LMS), and asynchronous education, for education that does not include real-time lessons. Studies have previously pointed out advantages of both modes: that synchronous distance learning may stimulate active interaction (Hrastinski, 2008), and that learner who take an asynchronous distance course can study at their own pace (Liu et al 2019). The two modes have also been identified to encompass different challenges: where synchronous online learners may experience distraction, learners in asynchronous courses may feel isolated (ibid.). A major concern of distance learning has been the lack of interaction (Greener, 2021; Watts, 2016). When comparing results in the synchronous and asynchronous modes, several studies suggest that there are no differences between grades for learners who participate in synchronous and asynchronous modes of learning (e.g., Nieuwoudt, 2020; Schoenfeld-Tacher and Dorman, 2021). Instead, research suggest that it's

the time spent studying, not the mode, that is critical for the outcome (Schoenfeld- Tacher and Dorman, 2021). Research on L2 learning show disparate results, one study showed that synchronous learners outperformed the asynchronous group (Lotfi and Pozveh, 2019) and another study found that there were little differences in outcomes in synchronous and asynchronous modes (Ajabshir, 2019). The digital technologies of today provide ample possibilities for interaction in both synchronous and asynchronous modes (Greener, 2021; Watts, 2016) and some educational practices have begun to combine the synchronous and asynchronous modes of delivery and found that to be effective (Riwayatningsih and Sulistyani, 2020). Challenges include that when made optional, low achievers can choose the distance education as a strategy to avoid engaging in learning. It is therefore important to guide learners in their choices (Samson, 2020). When comparing classroom based face-to-face (f2f) learning with online education, Samson also observed that test-results and engagement levels decreased. However, Samson concludes that f2f does not mean learners are more engaged, but instead that more engaged learners are more likely to participate wherever education is offered. On a positive note, studies have linked combinations of synchronous and asynchronous modes of distance education to increased learner engagement (Rehman and Fatima, 2021) and increased interaction (Bruscato and Baptista, 2021; Lin and Gao, 2020). While some learners may prefer one mode over the other (Bailey, Almusharraf and Hatcher, 2021; Karaaslan, 2018) studies have also identified an emerging preference for both modes (Amiti, 2020; Gazan, 2020); that learners in general (Samson, 2020), and language learners (Cechova, Skybova and Koukalova, 2018) appreciate the flexibility the modes can offer if they are able to choose.

Learning Designs and Learning Activities

Following Lockyer, Agostinho and Bennett (2016) learning design is viewed as the outcome of teacher planning and design of learning activities that have a pedagogical intent. It seems commonly agreed that Learning Designs (LD) recognises a vast range of digital resources and potential combinations to facilitate and stimulate learner engagement in learning. However, LD goes beyond the technological aspects of education and commonly include a view of teachers as designers for learning, development of teaching practices, operationalisation of pedagogic theory, uses of digital tools and resources, and efforts to improve learning (Bonderup-Dohn, Godsk and Buus, 2019). Interestingly, researchers have advised that learner engagement should be at the forefront of LDs (e.g., Bezemer and Kress, 2008) and that poor designs may lead to unintended disengagement and increased discrepancies of outcomes between learners (Saltz and Heckman, 2020). Linking design to performance, researchers have found that merely informing teachers on the impact of their LD, reduced the number of assimilative activities (Toetnel and Rienties, 2016b). Importantly, it is the execution of learning activity, not the design itself that will lead to positive results (Awuor et al 2021; Missildine et al 2013; Pettersson, 2020; Teng, 2017). LDs in themselves cannot foresee all possible events that may play out in a complex real-life learning situation. Teachers in synchronous settings can to some extent, compensate for a less effective LD in a real-time setting, where learner engagement is negotiated (Bergdahl & Bond, 2021). However, in asynchronous settings the learner's engagement relies fully on the design considerations which are planned in beforehand. Similarly, without LD in synchronous settings, the lesson design would not build on any forethought. Thus, teachers need to understand how they influence engagement through their LD in synchronous as well as asynchronous modes in advance of the learning situation.

Engagement

Engagement can be said to reflect the interaction between a learner and learning content, learners, teachers, digital tools, and resources, (Boekaerts, 2016) and interpreted as purposeful direction of focus, mental effort in thinking, pro-active actions for learning (Bergdahl, 2022b; Halverson, 2016). Engaged learners experience higher levels of school success, grades, attendance, and overall well-being (Fredricks, Blumenfeld and Paris, 2004; Wang and Hofkens, 2019; Wang et al 2016). The behavioural dimension reflects the learner's capacity for participation and task involvement. (e.g., Bergdahl, 2022 a,b; Fredricks, Blumenfeld and Paris, 2004). In successful LDs, teachers include strategies that activate learners. This can be by prompts to participate in activity (Liu et al 2019). The emotional dimension includes the learner's (positive and negative) emotions in relation to learning, such as perceived enjoyment, acceptance of the teacher's instruction but also test anxiety or arousal (Linnenbrink, 2007). The cognitive dimension reflects, the learner's ability to concentrate, focus and have higher cognitive functions, and the ability to regulate and balance requirements and stimuli, in and out of school, both in relation to the physical space and to the digital tools and via the digital tools. It also reflects learner cognitive self-regulation; orientating, planning, managing, and organising their education (Fredricks, Blumenfeld and Paris, 2004; Greene, 2015). However, a one-sided focus on assimilative learning activities (i.e., cognitive engagement through listening, watching, reading) correlate negatively with grades (Toetenel and Rienties, 2016a). While specific tasks can stimulate asynchronous learner interaction, the complexity of the task in asynchronous L2 collaborative writing have been seen to have limited effects on the interaction learner patterns (Hsu, 2020). Thus, more cognitive load, does not seem to affect patterns of social engagement. Finally, the social dimension which can be said to reflect the learner interaction and communication with teachers and schoolmates and includes the process of becoming actively involved in interaction (e.g., asking for help, supporting others, engage in dialogues and collaboration) (Bergdahl, 2022 a, b; Fredricks, Blumenfeld and Paris, 2004). Zydney et al (2012) explored interaction in online learning and suggest that interaction that also is cognitively demanding does not easily happen in asynchronous learning without the facilitation of a teacher. The presented study explores how engagement is facilitated in synchronous and asynchronous second language learning.

Method

Context and Participants

To answer the research question, case study methodology is used to explore a phenomenon in a real-life setting: in a larger school for adult education in a city in Sweden, (Yin, 2003). The school offered BYOD Internet access, Google workspace for Education and laptops to all teachers and learners. After receiving the approval of the principle, purposive sampling (Bryman, 2016) was employed, meaning that teachers who taught second language learning online in ADE and SDE modes were approached. Both English as a second language (ESL) and Swedish as a second language (SSL) teachers accepted to take part in the study (see Table 1). This selection was made to enable a comparison of how engagement was facilitated across second language teaching (Olofsson et al 2020).

Data Collection

Data was collected at one school between April and December 2021 using observations and interviews (n=34), ADE, n=24, SDE, n=9. While observations were done in situ for the synchronous lessons that is not possible in an asynchronous setting (Kovanović et al 2015). With a focus on how the design facilitated learner engagement, the teacher was asked to demonstrate their design to the interviewer. The teacher would do this using a ‘talk-aloud’ technique (Li, 2016) taking on the role of a learner. As interviews were conducted using Zoom, the teachers would share their screen and perform the learning activities while describing aloud all actions they did as a learner. Shifting between the role as a learner and the teacher as designer, the teacher also answered clarifying questions and rated how each act time that passed. Since the learning situation had passed, teachers could potentially also be influenced about actual responses from learners when responding to the estimated duration (for e.g., one teacher demonstrated the number of times and duration that learners had watched an instructional video). When think-aloud is used, teachers access their design from another perspective (the learners), in which the arrangement may function as a stimulated recall (Li, 2016). The teachers visualised a ‘typical learner’, similar to a hypothetical user, in use-case scenarios (Kuroпка et al 2008). Although one learner will not reflect the time needed for every individual learner, time-related factors are critical in teaching (Kyndt et al 2014, Riel et al 2018).

Table 1: Demographics

Gender	Mode	Subject	Level	No. observation	Years' experience
Female	SDE	ESL	Course 4	1	27
Female	SDE	ESL	Course 4	1	25
Female	SDE	ESL	Course 3	1	17
Female	SDE	ESL	Course 2	1	14
Female	ADE	ESL	Course 3	3	10
Male	SDE	ESL	Course 1	1	13
Female	SDE	ESL	Course 3	1	9
Female	ADE	SSL	Course 1	2	30
Female	ADE	SSL	Course 4	2	25
Female	ADE	SSL	Course 4	2	12
Female	ADE	SSL	Course 3	2	25
Female	ADE	SSL	Course 1	2	43
Female	ADE	SSL	Course 3	2	12
Female	ADE	SSL	Course 2	2	17
Female	ADE	SSL	Course 4	2	4
Female	ADE/SDE	SSL	Course 4	2	15
Female	ADE	SSL	Course 3	2	22
Female	SDE	SSL	Course 3	1	8
Female	ADE	SSL	Course 2	1	17
Female	ADE	SSL	Course 1	2	12

During synchronous observations the duration of learning activities was observed in situ, and for asynchronous LD, teachers were asked to estimate the duration of each learning activity. The intention of such estimation is not to reflect the enactment of the LD, but to make visible the "hunch" or vague feeling that teachers base their decisions on when designing for learning (Thorpe, 2013). An observations schema was used in which the design elements (Cazden et al 1996) were captured using minute-by-minute coding of learning activities. Building on

engagement theory and what was inductively observed, these activities were subsequently linked to specific dimensions of engagement (see Section 3.4).

Data Analysis

A learning activity was used as the unit of analysis (Wellborn, 1991). Each LA was linked to the engagement dimension in the forefront of that LA informed by the EDLA-schema (Bergdahl & Gyllander-Torkildsen, 2022). Engagement was operationalised using previous engagement theory (Wang et al 2017, Bergdahl, 2022 a, b) and what was inductively captured using the observation schemas. For a detailed overview of operationalisation see Appendix A. While engagement dimensions may overlap, (learners may for example be both emotionally enthused and adopt pro-learning behaviours) (Fredricks, Reschly and Christenson, 2019), each activity was connected to the engagement dimension which was at the forefront of teacher design (see Appendix A). (Thus, if not observed in the empirical data, then it was not included). The data was screened and analysed using descriptive statistics to demonstrate the distribution of facilitation of engagement across the online educational modes using. Then Pearson's correlations test was conducted to further explore associations between variables (Field, 2018). Microsoft Excel 21.02 and JASP 16.0 were used for the statistical analyses.

Ethical Considerations

Following a written approval of the principal, each respondent was approached individually and asked for their consent to participate. The informed consent included information about the study, data collection, use and storage of data, principles of anonymity, and respondents' right to withdraw at any time without questions asked, in line with ethical guidelines (Ess, 2016; Hermerén, 2011) and were collected in writing. The respondents signed the informed consent before the data was collected.

Results

When exploring the total number of engagement dimensions facilitated (see Table 2), results reveal SDE and ADE designs would include a higher number of facilitated nuances within a specific engagement dimension (SDE 3.44, ADE, 2.92). The high number accounted for facilitation of social engagement (SDE) or cognitive engagement (ADE). SDE more often reflected behavioural engagement during the learning activity (SDE 0.89, ADE 0.69), but lesser facilitation for emotional engagement (SDE 0.11, ADE 0.68).

Table 2: Facilitated engagement across educational modes

Engagement	Synchronous Distance Education					Asynchronous Distance Education				
	<i>n</i>	M	SD	Min.	Max.	<i>n</i>	M	SD	Min.	Max.
	9					25				
Beh		0.89	0.93	0.00	3.00		0.68	0.69	0.00	3.00
Cog		1.00	0.50	0.00	2.00		2.84	0.90	0.00	4.00
Emo		0.11	0.33	0.00	1.00		0.68	0.75	0.00	2.00
Soc		3.33	1.41	1.00	5.00		0.32	0.48	0.00	1.00
Tot. nuances		3.44	1.33	1.00	5.00		2.92	0.70	1.00	4.00

Further exploration shows that the facilitation of specific nuances within the engagement dimension was similar to the occurrence of support for that dimension. That is teachers who readily design for an engagement dimension would also facilitate for more nuances within that dimension.

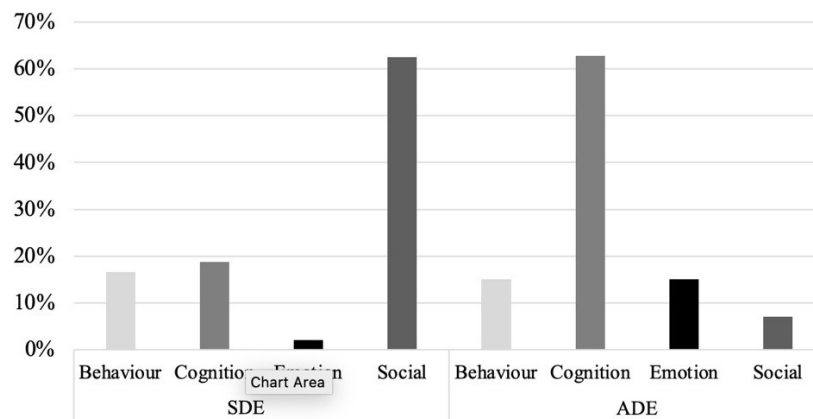


Figure 1: Engagement dimension across synchronous and asynchronous modes

Figure 1 reflects that the social and cognitive dimensions were dominated in separate modes, indicating it might be easier, or more intuitive, to facilitate social or cognitive engagement. There is a potential risk with a one-sided focus on engagement; for SDE that learning situations may stimulate social interaction so much that the time is not effectively used to support practice or training (behavioural) and may not be cognitively challenging, and for ADE that learners are required to own self-regulation capacities. In turn, if these asynchronous activities have an assimilative nature; that is related with lower grades. A one-sided focus on supporting cognitive engagement may thus not be the most effective way of designing asynchronous online learning (for a visualisation of observed combinations, see Figure 2). ADE and SDE also supported combinations of learning engagement in a learning situation differently. Results show that SDE teachers rely on fewer combinations: facilitating cognitive and social engagement or adding behavioural or emotional engagement (even if the former were rare). Given that ADE has been traditionally employed in adult education, it was unsurprising to find that ADE teachers offered a wider plethora of nuances in their designs.

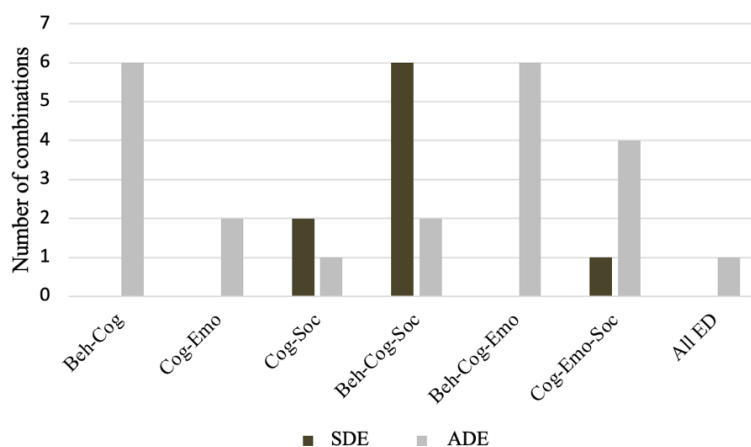


Figure 2 Combinations of engagement dimension across synchronous and asynchronous modes

Figure 2 shows that while one ADE teacher-facilitated for all engagement dimensions (with cognitive engagement being dominant) and two other designs supported socially shared regulation, there was otherwise little support for behaviour and social engagement. Given that ADE has more experience in offering online Education, it was unsurprising to find that ADE teachers offer a wider plethora of nuances in their designs. While one ADE teacher-facilitated for all engagement.

Table 3 Correlation between factors that may influence engagement

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. SDE	1.00								
2. ESL	0.55*	1.00							
3. Level	0.02	0.08	1.00						
4. Duration	0.01	0.07	0.44	1.00					
5. Years***	-0.12	-0.19	0.30*	-0.57**	1.00				
6. Behavioural	0.13	0.13	0.09	0.16	0.25	1.00			
7. Cognitive	-0.71**	-0.36	0.14	0.16	0.18	-0.34	1.00		
8. Emotional	-0.36*	-0.17	0.07	-0.05	0.18	-0.36	0.40	1.00	
9. Social**	0.86**	.60**	0.10	0.06	0.18	0.03	-0.64*	-0.33	1.00

Correlation is significant (**) at the level of $p = >0.001$, and (*) at the level of $p = >0.05$

*** years relates to the number of years with teaching experience

Exploring if other factors, like subject, course level, duration or teachers' years in occupation influenced how teachers enacted designs for learner engagement. Table 3 shows that none of these, but instead the mode, influences how designs are enacted. Social engagement and SDE was found to be strongly positively correlated $r(32) = 0.86$, $p = >0.001$. There was a significant negative moderate correlation between SDE and cognition ($r(32) = -0.71$, $p = >0.001$) and between SDE and emotion ($r(32) = -0.36$, $p = >0.05$). While teachers' years in occupation was significantly negatively correlated with duration (length of learning situation ($r(32) = -0.57$, $p = >0.001$), there were no influences of years in occupation, course level or duration on how engagement was supported in learning. There was a moderate and negative correlation between the subject ESL and cognition ($r(32) = -0.36$, $p = >0.05$). However, because most lessons were ESL, which were taught in the SDE mode, the result is likely to reflect the mode, not the subject.

Discussion

Results have revealed that learners' behavioural, cognitive, emotional, and social engagement are supported in very different ways in asynchronous and synchronous learning designs in L2 adult education. As described in the background, it may be tempting to refer to a particular mode when deciding on the effectiveness of education. Some previous studies have indeed pointed out that there is little difference in educational outcome when comparing the synchronous and asynchronous mode of delivery (e.g., Ajabshir, 2019; Nieuwoudt, 2020; Schoenfeld-Tacher and Dorman, 2021). Yet, others propose that synchronous education is better than asynchronous (Lotfi and Pozveh, 2019). This study adds to these findings, that it is not merely about the mode of delivery that need to be considered, but how the learning engages learners, and how the teacher can work across the conditions of each mode of delivery. Exploring the link between L2 learners' engagement and satisfaction Ji (et al 2022) adopted a three-dimensional conceptualisation (behavioural, cognitive and emotional), where

indicators like note-taking and using materials would have been coded similarly here (to the behavioural dimension), but interaction; such as asking question, discussing, in this study coded as social (rather than behavioural) engagement, as this study adopts a four-dimensional conceptualisation of engagement (Bergdahl et al 2022a; Fredricks et al 2016; Wang et al 2017). Adopting a four-dimensional conceptualisation, that includes a social dimension of engagement enabled exploration of significant differences between ADE and SDE designs. For example, the major ingredient in SDE designs was social engagement. Moreover, SDE (planned and enacted) designs could include facilitation of 4-5 nuances of social engagement (but not support other dimensions of engagement in a similar nuanced way). Irrespective of the estimated or real time of learning activities, such variation of social engagement was not identified in the ADE designs. On the other hand, SDE designs typically had little support for emotional engagement and results revealed fewer variation of support for the cognitive dimension than ADE. At the same time, ADE designs displayed nuanced ways to support cognition and a much less facilitation of social engagement. As it has been observed that uneven participation in collaboration can be linked back to poor designs (Vuopala et al 2014), social engagement can be supported through dialogues, interaction, and collaboration (Wang et al 2017). It is also suggested that both SDE and ADE designs can include more aware facilitation of the behavioural dimensions (i.e., what can learners do, such as practice and rehearse) to - and in line with (Riel et al 2018; Samson, 2020) further stimulate learner engagement. While asynchronous practices are difficult to change ad hoc, the synchronous practice also require an aware online design. A single focus on the educational mode alone might not be the best way forward; indeed, both synchronous and asynchronous elements, may be combined to best influence learner engagement. Developed technologies and inclusion of real-time elements, are likely to increase, and with that, also the need to provide guidance for teachers on how to design for learning and support learner engagement in these emerging combinations of educational modes.

There are several limitations to the study: A first limitation is related to the measurements of behavioural, cognitive, emotional, and social engagement. This study only includes such indicators of engagement that were designs to be facilitated. Although appendix A shows the learning activities in relation to each dimension, the learner perspective of which engagement dimensions that were activated remains to be explored. Second, generalization is limited due to the low number of observations, the context (the focus of adult education).

Conclusion

Distance education is no longer merely asynchronous but may be offered with synchronous elements, or a combination of the modes, that may include interaction of varying kind. However, one cannot say that one mode is “better” than the other. Instead, this study shows that synchronous and asynchronous modes in adult education significantly impact the kind of engagement teachers support. Results also reveal that despite being "traditional", the well-established mode of asynchronous distance education reflected a wider repertoire of facilitated engagement. However, learners who enrol with asynchronous education are still to expect cognitive- heavy learning that requires self-regulation. On the other hand, the emerging mode (SDE) displayed facilitating social engagement with ease. Conclusively, educational modes are still emerging and could develop to support learners in more varied ways. Teachers may also become more aware of how to overcome the hindrances to support engagement in the different modes, either by including a/synchronous elements, innovative and informed learning designs.

Appendix A

Operationalisation, overview of abbreviation These dimensions refer to teachers' enacted learning designs

Behavioural dimension

P: Practice i.e., teacher instructs learners to practice through synchronous exercises

P(a/s): Practice a/synchronous i.e., teacher instructs learners practice through both asynchronous and synchronous exercises

P(a/i): Asynchronous interact i.e., teacher instructs learners to practice through asynchronously interact with peers

P(a): Practice asynchronous i.e., teacher instructs learners to practice individually through asynchronous exercises

Cognitive dimension

L: Listen, look i.e., teacher provides understanding through assimilative tasks, reading, listening.

SRL/O: Orientation i.e., learner orientates himself/herself in an online system/forum/application

SRL/P: Planning i.e., learner plans schoolwork

SRL/C: Checking i.e., learner check and submits work

Emotional dimension

DO: Produce i.e., teacher instructs learners to do schoolwork which is to be assessed

IA Individual Assessment i.e., teacher provides a checklist for self-assessment

A Test and assessment i.e., teacher assess progression, e.g., through quizzes, oral exams

Social dimension

D: Discussion i.e., teacher instructs learners to discuss a matter

C: Collaboration i.e., teacher instructs learners to collaborate

I(S): Student-led interaction i.e., learner take initiative to interaction, e.g., raising question

I(T): Teacher- led interaction i.e., teacher prompts interaction, e.g., asking question I(Tech):

IT-led interaction i.e., learner moves through a system with built in scaffolding

SSRL: Shared Regulation i.e., Socially Shared Regulation: learner plans, set goals and strategies to collaborate

AI: Asynchronous interaction i.e., learner interacts using static for a, e.g., through blog posts

Other activities observed

Break (intentional) i.e., teacher proposes a break

TeB Technology breakdown B i.e., technology that is not working causes a halt to learn

Paus (intentional) i.e., teacher waits for all learners to re-join after having done separate activities

DRL Digital relocation i.e., learner moves into different online locations

ID Paus (unintentional) i.e., teacher pauses the instruction if there are issues with accessing materials Adm Course-administration. i.e., time for learners to for example create an account

CI Course information i.e., teacher provide general course-related information

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