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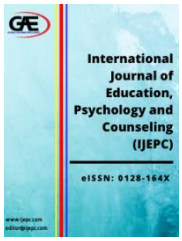

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AN OVERVIEW OF REMOTE TEACHING: EMPLOYING ACTIVE LEARNING TO ENGAGE STUDENTS DURING COVID-19 PANDEMIC IN HIGHER EDUCATION

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Abstract:

Remote teaching is the "*new normal*" especially in higher educational institutions as the world grapples with the raging COVID-19 pandemic and innumerable changes caused by disruptive technologies. Higher educational institutions have resorted to remote teaching as a means of ensuring student safety and an effective learning approach. For this approach to succeed, didactic methods must be carefully chosen to ensure student active engagement during learning processes. Specifically, cognitive engagement has been often cited as a critical component of students' educational experience which includes active, constructive, interactive, and passive cognitive modes of engagement. These modes allow students to demonstrate knowledge as node-link structures through different overt behavioural knowledge-change processes that require individuals to store, activate, link, and infer varying stages of learning also known as Active Learning (AL). AL enables students' engagement activities to construct knowledge, improve subject content retention and better their performance in achieving learning outcomes. AL can leverage both synchronous and asynchronous teaching pedagogical methods. The primary goal of this review was to examine AL literature during COVID-19 pandemic in order to propose solutions for improving student cognitive engagement in higher educational institutions.

Keywords:

Remote Teaching, Active Learning (AL), Student Engagement, Instructional Learning Approaches, COVID-19, ICAP

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Introduction

The COVID-19 pandemic nearly affected almost all higher educational institutions as they switched to digital format (Hollister et al., 2022) as the main instructional alternative. This sudden switch indicates that digital technology is key to future educational practices. A typical example is remote learning and teaching, which takes place outside the walls of a physical classroom where educators are separated from their students in space (distance) and time (Malik et al., 2019; Raman, 2014). This kind of pedagogics is basically facilitated with the help of technology mediated tools, and applications like Learning Management Systems (LMS), video conferencing software and discussion boards (Mpungose & Khoza, 2022; Şahin & Yurdugül, 2022). But it is difficult to monitor students' engagement with these systems as they are complex to use and assess. Nevertheless, it is important to have a flexible digital learner-centric approach that provides an effective cognitive learning choice in higher educational settings. Studies have used different terms in describing learner engagement, student engagement, academic engagement, and school engagement (Christenson et al., 2012a). Some of these terms take a different nuance in definition for instance, learner engagement could be a broad term that includes learning in both formal and informal academic settings, whereas student engagement would concentrate mainly on academic (formal education) contexts (Venton & Pompano, 2021a; Zayapragassarazan, 2020). In this study, both learner and student engagement will be used concurrently in the context of higher learning institutions just to make a uniformity of ideas during the discussion.

Therefore, a series of research have been carried out on remote learning (Abdullah et al., 2022; Topuz et al., 2022), Intelligent Tutoring Systems (ITS), and other digital-mediated teaching systems to engage and personalize innovative instructional practices (Kalogirou, 2005; Millican, 2017; Mohammed & 'Nell' Watson, 2019). However, the high drop-out rate in remote learning still continues to grow, this is especially evident in Massive Open Online Courses (MOOC). Existing studies have noted that online courses (MOOC) (Bogdan, 2017; Conijn et al., 2018; Jacobsen, 2019), have much higher dropout rates than traditional-in person or face-to-face courses. Nonetheless, many tools and platforms are being developed to identify students who may disengage from instruction and are at risk of dropping out (Aydin et al., 2019; Henrie et al., 2015; Kemple & Snipes, 2000). Moreover, other studies have shown positive impact of innovative instructional practices and experiences amongst higher education students (Artino, 2010; Mohammed & 'Nell' Watson, 2019; Shaffer et al., 2015). An interesting study highlighted the roles, relationships, manner of teachers, institutional structure, and cultural practices' impact on active student engagement (Hollister et al., 2022).

In fact the apprehension towards active student engagement is inevitable. Perhaps student engagement may not be achieved as expected if teachers have no technical know-how or spend less time trying to work out on how to actively engage students (Umbach & Matthew R. Wawrzynski, 2015). Yet, other similar studies highlight the socio-political and environmental factors like family background and economic status that affect learner's active engagement (Miliszewska & Horwood, 2006; Portelli & McMahon, 2004). In summing-up all these studies, it is inferred that engagement is multifaceted in nature, and can be affected by many factors. An important scenario is the advent of the Covid-19 pandemic especially in higher education. The need to assess these factors and how they affect pedagogy is pertinent. Pedagogical assessments are swiftly moving online on an unprecedent scale in COVID-19 pandemic environment (Topuz et al., 2022). One study employed technology where a flipped classroom was implemented for students. This teaching method provides learners with didactic material

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in pre-recorded form to watch prior to attending class. This session then shifts to synthesis, application, and case-based discussion (Chick et al., 2020) during class time. In another interesting study, a descriptive survey was performed using simple random sampling technique to analyse the effect of COVID-19 on learning for Ghanaian students (Owusu-Fordjour et al., 2020). The study suggested an innovative introduction of off-line digital learning systems to replace face-to-face pedagogical approaches among Ghanaian students (Owusu-Fordjour et al., 2020). Another study underlined an extensive investigation of a large-scale online education campaign during the COVID-19 pandemic organized by the Chinese Government titled "*School's out, But Class's On*" (Zhou et al., 2020). Moreover, it was revealed that large-scale online activities are somewhat impactful especially in providing higher education institutions with useful integration experiences in digital technology (Zhou et al., 2020). There is no doubt that the idea of digital technologies has helped to transform education. Thus, there remains the need to understand the potentials and benefits of remote teaching-learning especially in the 21st century; not limiting it to Covid-19 pandemic alone but to the paradigm shift in labour market and pedagogical trends as a whole. This study aims at theoretically substantiating existing literature on engagement behaviours in remote learning to answer the following questions;

RQ1: How can synchronous and asynchronous methods of teaching be positively leveraged for remote teaching to achieve AL in higher educational institutions?
RQ2: What influence did instructional AL perspective have on higher institutional students during COVID-19 pandemic?
RQ3: What are the most important findings about remote teaching during COVID-19 pandemic and what are the recommendations for future studies?

The study is structured as follows; Section I presents a brief introduction of the study, the effect of covid-19 in higher educational institutions are discussed in this section highlighting gaps with research questions; Section II describes remote teaching, application of synchronous and asynchronous pedagogical teaching, also the section highlights some remote learning solutions to engage students; Section III provides a brief description of AL, why it is needed and its approaches. The section also highlights active student engagement and participation in times of crisis and the demonstration of knowledge amongst students. Section IV marks the end of the paper with brief discussions and conclusions with an outlook on further research.

Remote Teaching

E-learning, distance education, or online learning are terms used to describe technologically mediated teaching methods outside the state-of-the art pedagogical system. These systems of learning have enabled students learn without temporal or geographical boundaries via the use of digitization (List et al., 2020). Generally, LMS are used to plan, administer and transfer knowledge to students. An LMS allows same lecture, video, slides, or line of paragraph to be re-watched or reread many times and saved for future use. Other benefits of LMS include: personalized style of learning and teaching; less cost of implementation; assessment can be made with Technology Enhanced Assessment Systems (TEA); teachers can teach with ease and students can learn with ease, have break and get through their studies without losing interest or getting bored (Tichauer, 2015). Many instructional learning models have been designed to ease the remote teaching processes. However, any remote learning method needs practical engagement from both teachers and learners' perspectives. In order to engage students and improve cognitive learning, there is a need for teachers to have a planned approach of creating

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and disseminating academic content for students as illustrated in Figure 1.

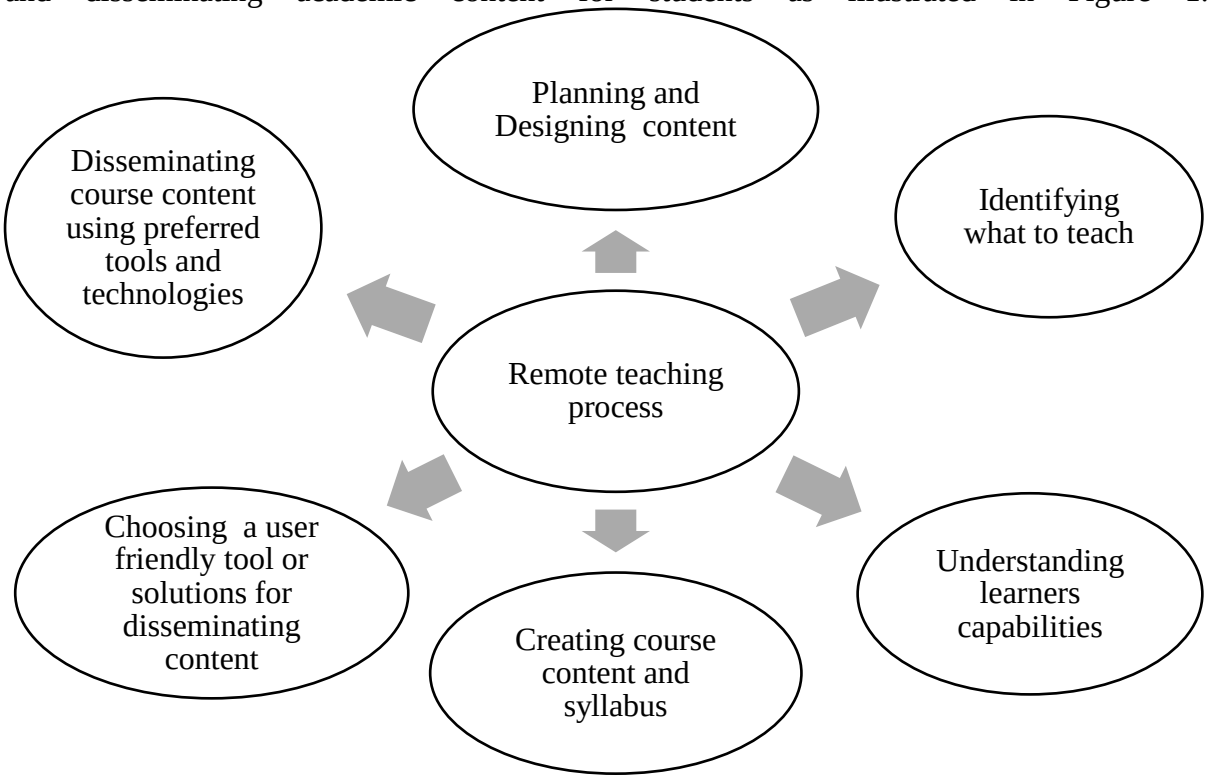

Figure 1: Process of Creating a Remote Course Content

Figure 1 shows the process of creating and teaching remote courses. The first-three steps are basically about preparing content and understanding who is to be taught. These steps are the most essential steps in initializing a remote teaching process. This method is considered to be practical for creating teaching materials. In other words, these steps focus more on what teaching content will be, rather than how it should be taught (Kurt, 2017). While, the last-three steps of the process focus on how content should be taught and technology solutions for disseminating content. There are different approaches and models to creating online teaching contents, and one of them is the ADDIE model (Kurt, 2018). ADDIE which stands for (Analyze, Design, Develop, Implement, and Evaluate) is an instructional design framework that does not impose a strict linear progression through steps (Kurt, 2018. Educational stakeholders find this approach to be very useful because ADDIE has stages that clearly define the material development process (Kurt, 2018). This model has found wide acceptance and usage from many researchers and fields (Ganesan & Muruganantham, 2015; Gordon Welty, 2007; Molenda, 2001). Grant Wiggins and Jay McTighe in their excellent book titled "*Understanding by Design*" proposed a backward instructional design that can also be employed for remote teaching. The framework reverses the usual approach such that the aim of course design becomes the learning outcome (Wiggins & Mctighe, 2005). It is when one understands what students should learn that the focus will turn towards considering the best methods for teaching the content and accomplishing the learning goals (Kurt, 2018).

To engage student and improve AL processes using remoting teaching, both synchronous and asynchronous methods are needed. In other words, contingency plans must be put in place in all institutions for synchronous and asynchronous remote teaching. Remote teaching may be synchronous or asynchronous depending on the context of usage. Synchronous teaching

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pedagogy involves listening or watching teachers deliver lectures live via any technologically mediated platforms, while asynchronous teaching pedagogy involves delivering lectures using recorded video for students using online tools or platforms. In relation to communication participation, asynchronous teaching involves cognitive participation. This reflects, and increases the ability to process information better. On the other hand, synchronous methods involve personal participation by the arousal, motivation, and convergence of meaning. There is a need to understand both methods. Table 1 highlights the context of usage for both teaching methods.

Table 1: Application (Why, When, And How) to Use Synchronous vs. Asynchronous Remote Teaching Source (Kaur, 2013)

Context	Synchronous remote teaching	Asynchronous remote teaching
Why?	• It enables increased student commitment as well as motivation. This is because quick feedback is expected. • It creates a sense of interaction with social involvement with the use of tele-presence applications. • Timeliness is encouraged amongst student to keep-up-to-date feedback of learning process. • High concentration on speaking and hearing when lectures are being delivered. • It is easy to add novel ideas during brainstorming and conversation sessions (spontaneity). • It causes familiarity by simulating a face-to-face pedagogy teaching method.	• Flexible and convenient to use. • Needs more time to reflect on studies because immediate or quick feedback is not needed. • Concentrates more on writing and reading. • Access to course materials as at when needed.
How?	Zoom, Google class, instant messaging app and other online conferencing tool	Employing tools like canvas, pages, slides, and inbox for conversations as well as giving assignment to students
When?	task-oriented sessions, planning, brainstorming, or structuring of task for learning purposes.	Teaching tools to reflect on complex tasks and to communicate when synchronous pedagogy meetings cannot be scheduled.

Table 1 provides a better insight for both synchronous and asynchronous teaching pedagogical methods. These can be categorized based on remote teaching needs, but most online platforms offer multi-faceted functionalities (List et al., 2020). These remote teaching tools can be categorized as online, offline, (video, audio, game or text-based) learning app, digital

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catalogues or repository, self, or collaborative learning contents. As discussed in previous sections, remote teaching platforms are aimed at supporting AL through digitally mediated technologies as will be further discussed in the next section of the study.

Active Learning (AL)

There is a blurry line between AL and passive learning (PL). Students are more focused on furiously scribbling and taking notes of every word rather than understanding and analysing the meaning of the words in the notes or lecture. In a world with a job market dependent on critical thinking tasks, nurturing critical thinking skills is essential. The growing need for students with strong cognitive, critical, technological, and computational thinking skills should be addressed (Grover & Pea, 2018; Kohen-Vacs & Milrad, 2019). There is a lack of universally accepted definitions for AL since different fields of studies have varying interpretations of some terms. Thus, it is possible to provide some definitions to highlight distinctions on how such terms like problem-based, collaborative, and cooperative learning come into play. Nevertheless, all these instructional learning approaches can be regarded as forms of AL depending on their context of usage.

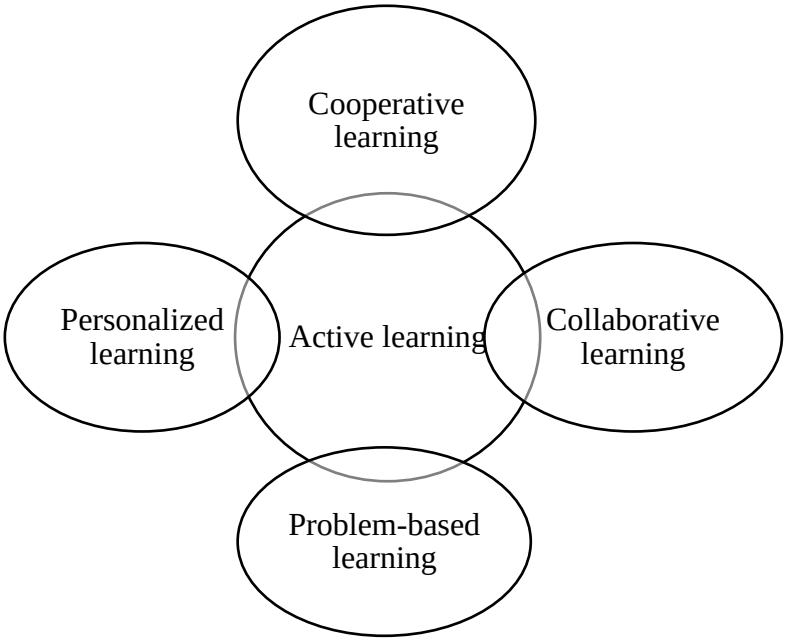

Figure 2: AL Context of Usage

Collaborative or Community-based learning is an instructional approach where students work together usually in a group to accomplish a given task or goal (Ponticiello et al., 2021). On the other hand, cooperative learning is a structured type of collaborative work whereby students undertake similar goals while being evaluated individually (Ponticiello et al., 2021). Problem-based learning is an active approach but not necessarily a collaborative one (Prince, 2004). It has a significant amount of self-directed effort from students to resolve problems introduced at the beginning of the instructional cycle and thus serve as a motivation for learning (Prince, 2004). These approaches can be either AL or PL depending on their context of usage. The contrasting concept of AL and PL can be practically seen in both teachers and student's perspectives. PL is most often defined as students learning while teachers deliver a lecture. AL

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is a strategy that engages students as active participants in a learning process with their instructor. This approach involves students working together as a structured team-based learning or working individually based on a pedagogical framework or tasks that are either long, short, simple, or difficult (Nelson, 2020). This concept is contrary to a passive learning approach, which involves students not actively participating in the learning process. To have a better understanding of AL and PL; the following explanation is essential. Didactic instruction is defined as an authoritative approach to teaching in which students participate passively. Didactic instruction turns a teacher into a dispenser of meaningful information while students become idle recipients (Coolman, 2016). However, students can ask questions to gain better understanding of the information disseminated. Therefore, this does not have to be an '*all one way'* approach. This approach dates as far back as the early 14th century (medieval times) when teachers read out loud to students while students took notes. At the time, information was difficult to access, hence instructors and students took this approach to solve pedagogical issues for ages (Coolman, 2016). However, a one-way transfer of information from instructor to student is criticized as being a poor approach to engage students. There is some established evidence that AL improves critical thinking skills and enhances interpersonal skills (Prince, 2004). In addition, AL increases retention thereby reducing course failure, and thus enabling dissemination of new knowledge, and increasing student motivation (Prince, 2004).

Existing studies on AL refer to how students engage in the instructioal process. The most prominent research conducted on AL has been at the tertiary level classrooms, perhaps this is because AL is defined by collaborative or group work (Chi et al., 2018). This approach of learning has demonstrated its effectiveness for quite some time as claimed by many studies (Crouch & Mazur, 2001; Faust & Paulson, 1998). In fact, Bajak (2014) and Crouch & Mazur (2001) had called for a ban on lecturing and had promoted the idea of collaborative learning instead, along with flipped classrooms. Similarly a study by (Yusuf & Taiye, 2021) examined whether flipped learning environment is a disruption to the traditional instructional learning approach, taking 21st century skills as pertinent skills to be acquired by students before graduation. Another comprehensive meta-analysis study of science related domains (Freeman et al., 2014) had interesting findings. The study revealed that AL has a potential that is unambiguously significant to enhance student learning when compared with passive learning methods (Freeman et al., 2014). This study contrasts with a related research with findings in cognitive engagement achievement (Greene, 2015; Sinatra et al., 2015). The successful implementation of AL has tremendously improved student knowledege retention and learning processes especially in higher learning institutions. This may be due to the easier binary discrimination of PL versus AL, whereas cognitive engagement is difficult to measure and can vary in degrees (Chi et al., 2018; Chi & Wylie, 2014; Coolman, 2016) depending on the context and subject matter being studied.

Whether technology promotes AL may possibly be a matter of discussion since its application does not innately provide positive learning experience. In fact, digital learning has performed poorly in existing studies because its implementation was mostly passive in nature (Coolman, 2016). There is need to rethink of how to bring AL to classrooms and how to teach students using digitally mediated technologies like discussion boards, online adaptive tutorials and virtual field trips to engage with peers. However, not all teaching sessions need to be maximally active. It may not be realistic but at some point all learning experiences should incorporate AL. This notion is better explained by understanding the potentials and weaknesses of AL approaches or perspectives. A detailed account of strengths and weaknesses of Active Learning

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is described in Table 2 (Adrianna J. Kezar, 2006; Barling et al., 2008; Chi & Wylie, 2014; Coates, 2007; Kahu, 2013; Pike, 2006; Zhao & Kuh, 2004).

Table 2: Describes AL Perspectives, Their Strengths, and Weaknesses

	Authors	Description	Strength	Weakness
Behavioural perspective	(Adrianna J. Kezar, 2006; Barling et al., 2008; Chi & Wylie, 2014; Coates, 2007; Kahu, 2013; Pike, 2006; Zhao & Kuh, 2004)	By a subscale, this perspective incorporates students behavioural and thinking processes. For example, it takes the degree of active student collaboration and level of academic challenges. Studies have proposed new models of engagement like the four-way styles-intense typology of student's engagement, passive-linked to the common distinction between academic and social engagement and finally collaborative independence.	It aims to resolve the problem of understanding behavioural engagement by utilizing a strength, which is the inclusion of many distal consequences of engagement with questions about how student time has contributed towards a broader life skill like; developing personal values, understanding and knowing people of different ethnicities and adding values to the welfare of a community. Another, strength is exploring the impact of a wide range of variables on student's engagement such as missions, expenditures, and learning communities.	Some valuable information has been missed in the behavioural perspective which would have given a better insight for student experience. This is not to suggest that the behavioural perspective has not provided some other meaningful valuable information for student engagement. however, it explains a limited part of the multidimensional perspective of student engagement, relationship between student behaviour and teachers' practice.

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Psychological perspective	(Archambault et al., 2009; Fredricks et al., 2004; Jimerson, 2004; Kahu, 2013; Wang & Holcombe, 2010)	Psychology perspective goes as far as having a broader understanding of student engagement. Three dimensions of behaviour, cognition and affect are considered by theorist as the most relevant facets of a single meta construct for student engagement.	It considers both emotional and behavioural engagement as a prerequisite for student cognitive learning engagement.	Between dimensions there is a lack of definition and differentiation in the psychological perspectives which is a major limitation for student engagement.
Socio-cultural perspective	(Christenson et al., 2012a; Kahu, 2013; Norton et al., 2009; Zepke & Leach, 2010)	Socio-cultural perspective mainly concentrates on the impact of the broader social context on student experience and learning engagement.	The benefit of this perspective is that it highlights the potential for institutions to consider institutions practices, students support structures and the socio-political debates impacting on student's engagement.	The problem of renegotiating the identity within culture are positioned as '*other'* has been investigated with various groups of non-traditional students, like older students. This adds a critical and often neglected piece to the task of knowing learner's engagement.

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	(Christenson et al., 2012b; Hardy & Bryson, 2010; Kahu, 2013; Norton et al., 2009; Zepke & Leach, 2010)	It incorporates the notion that institutions should be more about academic qualifications. Engagement in this view is about dynamic continuum with varying antecedence (task, classroom, course, institutions) and thus not measurable by surveys but best understood through rooted understanding of qualitative practices.	It recognizes the key importance of factors like emotions. For instance, highlighting critical importance of teachers' dispositions and need to foster a sense of belonging.	It fails to distinguish between engagements and its antecedents.
Holistic perspective				

Table 2 highlights four perspectives describing strengths and weaknesses regarding student active engagement. Student engagement is an important factor in any learning process. It involves students and teachers participating and creating a good but interesting atmosphere during pedagogical sessions (Inggris, 2016).

Shi (2006) stated that student engagement occurs as a phenomenon when students become invested social-emotionally, intellectually, and behaviourally in a collaborative discourse through a digital medium. Engagement is synonymously used with involvement, investment, or commitment. It is used not only for participants interacting with each other but also in a sense of engagement with the subject matter as well as in a collaborative discourse (Shi, 2006). Fredricks et al. (2004) asserted that student engagement can be categorized into three dimensions namely; Behavioural, Emotional and Cognitive engagement. Behavioural engagement involves attendance and would potentially demonstrate desired classroom behaviours. Emotional engagement involves the display of affective reactions like a sense of belonging, enjoyment, or interest. Generally, students invest cognitively in learning and seek to go an extra mile to learn more challenging tasks or skillsets for cognitive engagement (Fredricks et al., 2004).

Other interesting studies by (Chi et al., 2018; Chi & Wylie, 2014) suggested the ICAP (Interactive, Constructive, Active and Passive) framework for students' cognitive engagement. ICAP theory defines the task of cognitive engagement that is based on learners' overt behaviours. More importantly, it proposes that student engagement behaviours can be classified

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into four modes. They include: Interactive, Constructive, Active and Passive (Chi & Wylie, 2014). The first mode of engagement behaviour is the Interactive cognitive engagement, which simply operationalizes behaviours that involve co-creating and dialoguing. Dialogue must primarily be constructive and interactive for both actors (i.e. teachers and students) to generate knowledge beyond topic of discourse. It becomes easier for students to integrate their teachers or peers' understanding of topic of discourse and to adjust to their own mental modes. The second mode of engagement is Constructive cognitive engagement. This one allows students to generate new and more external outputs, concept, information, or ideas that are not available in the provided learning material. Activities in constructive mode include asking questions, drawing concept maps, comparing, and contrasting topics or cases, posing problems, and writing one's own notes. The third mode of cognitive engagement behaviour is the Active cognitive engagement where students reconstruct some parts of the course material to indicate important areas or ideas. This can be done by pointing to or gesturing at what they are reading or problem they are solving; reviewing selected parts of course material either by (rewinding or pausing), highlighting or underlining important text from a slide or course material or copying some part or steps of a solution. The last or Fourth mode of cognitive engagement behaviour is the Passive cognitive engagement. It describes students as receivers of information from teachers without overtly performing any other task related to learning. This mode is identified with activities such as; paying attention, and listening without taking notes during a lesson or lecture. A summary of the ICAP framework (Chi & Wylie, 2014) is described in Table 3.

Table 3: ICAP Framework Source(Chi & Wylie, 2014)

Category	Interactive	Constructive	Active	Passive
Hypothesis	*I>*	*C>*	*A>*	*P*
Characteristics	Dialoguing/ Co-creating	Generating	Manipulating	Receiving
Definition	This involves creating or generating more information content through dialoguing with peer (or group members)	New information content or inferences are created that goes beyond what was presented during pedagogical session.	Activities or task performed to concentrate more on learning by manipulating course materials	Rarely paying full attention to receiving information or learning material.

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Knowledge-change processes		The knowledge change process in this category is in form of a mutual benefits or co-inferring amongst both students and instructors	The process of knowledge transfer in constructive theory is comparing, inferring, and connecting in nature		Information in this category is stored, encapsulated, and isolated most times.
Expected outputs or outcome		Expected outcomes involves the invention new or novel idea, concepts, or Products (cocreating)	This category involves transferring a new concept or context to be interpreted.	Outcomes from this category can be applied in similar contexts.	Knowledge or information content shared can be recalled verbatim, same, or identically.
Expected learning outcome s or outputs		Expectation of learning is at its highest peak	Understanding learning outcomes is high	Understanding learning outcomes is shallow	Leaning outcomes is at minimal understanding
Use cases		This mode can be utilized when defending a group, justifying debates among peers, or answering and asking questions.	When reflecting, comparing, or contrasting videos. This mode can also be applied to summarize new words, contents from a book.	To highlight useful words from books, replaying or pausing video record to take verbatim notes of an idea	Reading an article/ book, watching a video, or listening to an audio lecture.

Table 3 gives a brief description of ICAP framework by highlighting its use cases, expected learning outcomes, knowledge change process, and provides a better insight for both synchronous and asynchronous teaching pedagogies. The present times of COVID-19 call for serious concern for Active Student Engagement as discussed in the following section of the study.

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Student Engagement During Covid-19 Pandemic In Remote Classes

This study reviewed literature with findings related to remote teaching during the Covid-19 pandemic. It is crystal clear that many students in higher learning institutions seemed to struggle with engagement during face to face study programs, and some reports suggest that students tended to struggle more frequently with engagement in remote programs as well (Hollister et al., 2022). In an online environment, active student engagement is critical to learning which may be investigated using a few behavioural measures. Behavioural measures for online learning can be categorised into two basic learning behaviours; namely observational and application learning behaviours. Observational learning includes behavioural tasks like reading and viewing posts, e-mails, documents, lecture notes and videos. On the other hand, the application learning behaviours include making learning visible, posting self-created resources, seeking clarification by writing feedback, and taking tests. Encouraging teachers and learners' participation during COVID-19 could involve incentivising milestones or achievements for students. This would include the provision of grades and constructive feedbacks, inclusion of self-assessment rubrics, certificates (of appreciation or participation), gamification using badges as reward for improved performance etc. These incentives would entice as well as motivate more active student engagement during the trying times of COVID-19 (Zayapragassarazan, 2020). A study by Dorfner and Zakerzadeh (2021) leveraged remote learning using games as an approach to promote student engagement. It was concluded that games cannot replace pedagogy but can be integrated into courses to improve the overall learning experience (Dorfner & Zakerzadeh, 2021). Another study by Moorhouse and Kohnke (2021) made a radical adaptation of emergency remote teaching (ERT) for varying pedagogical environments within a given timeframe during the pandemic. These are some of the experiences that could accelerate the organizational and didactic development of a school as any learning organization. Furthermore, in a related study the perception of transition to remote teaching in a group of computer science students with high computer literacy was essential (Toti & Alipour, 2021). Despite the high level of computer literacy, students struggled with the transition process, especially concerning such tasks including asking questions during video lectures and interacting with instructors (Toti & Alipour, 2021). Similarly, a study by Bond et al. (2021) made use of ERT which employed asynchronous and text-based tools as collaborative approach. The finding of the study was discussed against a pre-pandemic research on EduTech in higher learning institutions. With regards to EduTech, another study made use of connectedness under digital learning approaches (Hehir et al., 2021). This study was based on a combination of large numbers of quantifiable data and rich qualitative findings which reflected student experiences while the theoretical perspective was restricted to only psychological connectedness (Hehir et al., 2021). Most students reported that they had to struggle in order to stay connected to their peers and instructors while trying to keep up with the pace of course-works. Nonetheless, students had positive impressions of their instructional staff. Majority of students felt more comfortable asking and answering questions in online classes, suggesting that there might be features of online learning to which students are receptive, and which may also benefit in-person classes (Hollister et al., 2022).

Switching to remote learning was used to protect students against the spread of Covid-19. The study sought to understand if students and faculty had the tools and workspace conditions to continue to teach and learn effectively (Ponticiello et al., 2021). This switch had the most significant impact on participants whose home environments did have a private workspace (Ponticiello et al., 2021). In another interesting study by Hysaj and Hamam (2020) , students were asked to reflect on their experience of distance learning, and the data was analysed to

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understand the students' preferences of their study methods which enabled them to improve their cognitive skillsets. The data indicated reasons behind students' preferences of the preferred delivery method (Hysaj & Hamam, 2020). A recent study by Jamil et al. (2022) which employed online tele-objective structured clinical examination (OSCE) was developed and conducted using Microsoft Teams®. A thoughtfully planned tele-OSCE is a feasible method of examination that allows acceptable assessment of attained clinical competencies when social distancing measures are mandated. Findings suggested that stakeholders should look forwards to fortifying IT and online platform access to support optimal emergency remote teaching.

A study by Perets et al., (2020) investigated the experiences of both teachers and students during COVID-19 pandemic which found that when learning remotely, the students' main challenge was engagement. Meanwhile, prior to the pandemic period the main challenge for students was the course content. This can be related to the problem of peer connection and technological factors in remote teaching which could affect student engagement. The problem with student engagement in remote programs or courses might be attributed to the lack of personal and social accountability. An in-person or face to face teaching puts away distractions like mobile phones and engages students in dialogue in the form of Q&A within the lecture period, while taking notes, jotting, or scribbling ideas down. According to Hollister et al. (2022) students reported that majority of teachers used weekly quizzes, polls, and breakout rooms in their lectures to engage students. Students had high positive feedbacks of in-course polling, and some were mostly neutral or positive about weekly quizzes (as a replacement for midterm or final term exams). But some students were slightly negative about breakout rooms. Venton and Pompano (2021) reported that students are more engaged and interested in classes where AL is a main component. It was also noticed that students show up more with high attendance rate for synchronous sessions. According to the report by Abdullah et al. (2022) positive qualitative responses were received regarding students who found it easy to connect with peers than with the entire class sessions. The study employed a cross-sectional quantitative method and was conducted in 5 private tertiary institutions with a total of 480 undergraduate respondents using structural equation modelling (Abdullah et al., 2022). The results indicated that online future relevance, feedbacks, interaction, effective teaching, and well-being were statistically significant for student satisfaction (Abdullah et al., 2022). In keeping with Emergency Remote Teaching (ERT), Topuz et al. (2022) systematically analysed academic studies published in the year 2020 by sorting answers according to these research questions; (1) the kinds of platforms supported, (2) its security features, (3) other shared common features. Thus, it was noted that identifying features and trends in online system assessment is an essential guide to stakeholders for online academic evaluation and measurement.

Recommendation and Conclusion

Remote teaching presented numerous challenges illuminating core areas that need to be improved in higher educational settings. These challenges were more evident with the advent of Covid-19 pandemic. Although there are some limitations in the reviewed studies that should be probably expanded before generalizing or making conclusive remarks about outcomes or results, some important lessons were learned.

First, remote teaching still needs more of synchronous participation which could replicate a conducive environment similar to traditional AL. Hence, it is still better to set aside group meetings for both teachers and students for certain time intervals just to improve learning engagements. Studies revealed that students expressed their comfort with zoom chats and

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polling sessions. Such active learning opportunities can improve interactivity by lowering social and cultural barriers (Rhodes, 2021). Nevertheless, students engaged in AL more with the help of supporting learning materials (Venton & Pompano, 2021). One of the benefits of AL is that students do not need to struggle with course materials so much. They can get peer feedback as well as support from both teachers and colleagues. This helps to improve constructional, cultural, social and behavioral skillsets amongst students during AL sessions and group meetings.

A great deal of suitable flexible methods is required to facilitate students, teachers and school administrators for effective learning in higher educational institutions. This can be done when there is a continuous flow of collaborative ideas and concepts shared amongst these parties on how, what, when and where to improve engagement in AL. Discussions are underway at many higher learning institutions as one of the efforts to improve remote teaching and AL. Although one might argue that there is a different type of active student engagement that remote learning offers, the digital divide and pedagogical teaching approaches are some of the key issues to consider. The robust nature of remote teaching may increase access to online engagement systems if properly applied for teaching and learning purposes. This would continuously foster better study habits amongst students.

For this to be realized, faculties in higher learning institutions should get fully involved in identifying appropriate remote teaching platforms. They should engage in creating, designing and planning educational activities that would actively engage students for remote teaching options. These strategies would enable higher learning institutions to effectively overcome educational challenges and promote AL opportunities by expanding implementation processes and experiences.

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