Application of Universal Design for Learning into Remote English Education in Australia amid COVID-19 Pandemic

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Article Info	Abstract
	Confronted with the challenges posed by COVID-19 pandemic, students, teachers, educators and other stakeholders have to make the best of online learning from home and look at ways of optimizing remote learning experience. Embedded in the nature of inclusive schooling and organized in a specific public secondary school in Victoria, Australia, this study explores the effectiveness of Universal Design for Learning (UDL) on English as an additional language (EAL) students' online learning proficiency. The research findings indicate that in the discipline of EAL, with the assistance of multiple means of representation, expression and engagement as well as a range of information-communication technologies (ICTs), UDL has positive effects on students' academic performance and can trigger their positive attitudes towards online learning experience. This sheds light on the feasibility of improving remote learning quality and promoting inclusive online schooling that engages every student via the implementation of UDL integrated with different assistive technologies, which can be summarized as that UDL is one of the possible solutions to online learning that affords ample opportunities or more precisely, technical promises for the implementation of UDL.

Introduction

The outbreak of COVID-19 epidemic in 2020 has been posing significant challenges to education, highlighting the necessity of ensuring the continuity and quality of schooling under the circumstance that on-campus learning is mostly replaced by remote online learning. Faced with this unprecedented and dreadful disaster, governments around the world have launched prompt crisis responses in the field of education, with special attention to promoting student wellbeing as well as maintaining schooling even if some students have to stay quarantined at home.

Despite the endeavor to promote the continuity and quality of online learning experience amid the COVID-19 pandemic, chances are that some students have limited access to stable internet, sufficient electronic devices and other appropriate learning materials to support learning from home, which makes interrupted schooling the norm subject to this long-term social fluctuations. In this sense, assuring the quality of online learning experience in COVID-19 pandemic cannot be separated from an inclusive approach to education and schooling.

Inclusive education, though frequently referring to the respect of student differences, response to student needs and objection to normalization of disadvantaged students, has its own nature in the involvement of the full participation of all students into all aspects of schooling (Loreman et al., 2011). Contrast to the notion of integration that highlights student self-adaptation to existing schooling and curriculum and a sense of marginalization, inclusion is embedded in the idea that it is the schooling that should be adapted and reformed so that students can be fully involved into learning and maximize their learning outcomes. In this regard, inclusive schooling characterized by the emphasis on student well-being, respect of individual student needs and commitment to eliminating marginalization and promoting engagement is needed and should be undoubtedly promoted during this special period.

This paper presents a study of online English as an additional language (EAL) education in a particular public secondary school located in Victoria, Australia. Featured by an inclusive approach to schooling, the Universal Design for Learning (UDL) was implemented in online EAL classes with the assistance of information-communication technologies (ICTs) in order to examine the effects of UDL on online teaching and learning efficiency.

Literature Review

Universal Design for Learning

Inspired by the architectural concept of Universal Design that refers to the design of physical products and environments that, to the largest degree, could be used by everyone without the need of further adaptation or re-design (Center for Universal Design, 1997) and based on Vygotsky's theory that social interaction plays a significant role in the development of cognition (Vygotsky, 1978), the development of UDL theory derives from the research findings that the disconnect between student diversity and a 'one-size-fits-all' strategy cannot bring the learning outcomes as anticipated (Rose & Meyer, 2002) and is shaped by advancing research in cognitive science and neuroscience, which facilitates the understanding of how students learn "through memory, language processing, perception, thinking, and problem solving" with increasing variability of student population (Dalton, 2017, p. 19). Basically, UDL is defined to be "a framework that addresses the primary barrier to fostering expert learners within instructional environments: inflexible, 'one-size-fits-all' curricula…(that) raise unintentional barriers to learning" (Center for Applied Special Technology [CAST], 2011, p. 4). Otherwise stated, UDL is inclusive in nature, emphasizing that barriers to learning do not derive from the capabilities of learners but are originated from obstinate and unadaptable teaching goals, plans, materials, approaches and assessment that fail to achieve efficient interactions with students.

UDL is evidence-based and divided into two layers: conceptual layer and implementation layer. The conceptual layer includes three types of networks, and they are recognition work, strategic work and affective work. Summarized by Al-Azaweil et al. (2016), recognition network stands for 'what of learning', indicating that "learners use different ways to categorize what they see, hear, and read"; strategic work represents 'how of learning' and reflects that "learners use different ways to organize and express their thoughts and ideas"; affective network explains 'why of learning' and that "different ways can be applied to engage learners and keep

them excited and interested" (p. 42). In line with the three networks, there are three core principles developed by CAST embodied in the active response to student learning differences, and they are the offer of multiple means of representation, expression and engagement (Hall et al., 2003). The principle of multiple means of representation reflects 'how of learning', aimed at addressing learners' various capabilities and needs by using multiple and flexible ways of presenting content and information to support recognition learning; multiple means of expression represent 'what of learning', offering a great level of flexibility and diversity for students to demonstrate their knowledge and skills for strategic learning; the engagement principle sheds light on 'why of learning', and similarly, it attends to students' differing learning characteristics and provides multiple options for engagement to facilitate affective learning. Each principal has three corresponding guidelines with detailed coded checkpoints, indicating how UDL can be applied in practice to achieve inclusiveness in education.
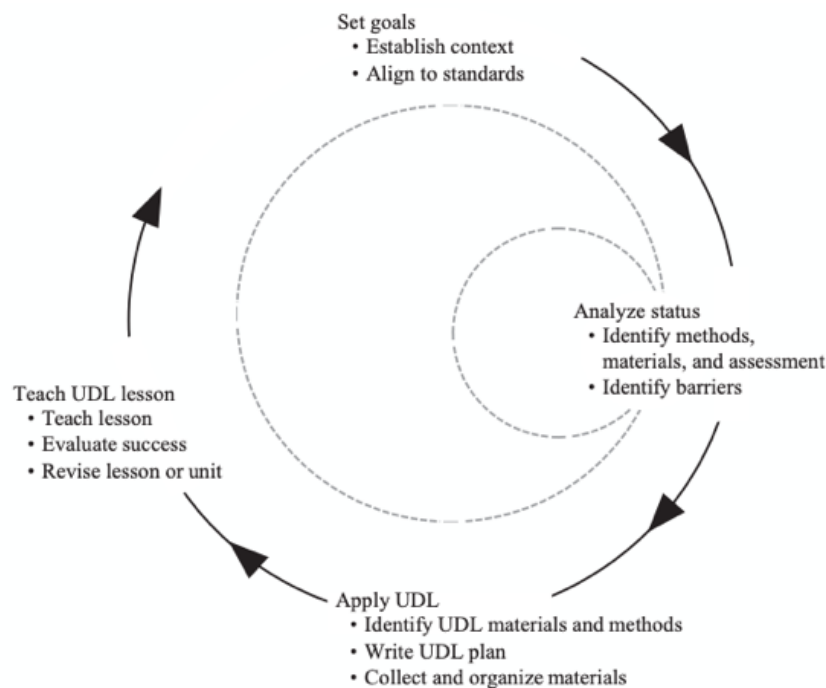

Figure 1. UDL Planning Process

The design of UDL serves for curriculum design and delivery for all learners. Bearing in mind 'how', 'what' and 'why' of learning, teachers and educators usually need to follow a certain process to design and deliver UDL-based lessons. Stangman et al. (2005) suggest that the process should include four steps: goal setting, status analysis, UDL application and UDL lesson delivery, which can be seen in Figure 1. To set effective learning goals, teachers may need to be clearly aware of the context for instruction, whether that being local context that includes but to limited to school culture and classroom context, or broader context related to state standards. Following this, education goals should be designed and set up "for the instructional episode", and teachers need to carefully evaluate the goals "to ensure alignment as well as a clear separation between goals and standards and the means for attaining them" (Stangman et al., 2005, p. 38). This step reflects that effective learning usually occurs in specific context (Govender, 2009) with the learning goals and outcomes intelligibly specified and communicated (Mahajan & Singh, 2017). To analyze the learning status of instruction, teachers need to conduct a closer inspection of the teaching context, with special attention to the identification of "the

current methodologies, assessments, and materials used to teach the learner" as well as the barriers to instruction, such as the availability of learning materials, opportunities for students to express what they have learned, to name but a few (Stangman et al., 2005, p. 38). The third step is to apply UDL into lesson planning. Aware of the learning goals and the instruction status, teachers need to identify "the goals, methods, assessments and materials used to implement the lesson", grounded in which they need to create a UDL lesson plan and organize learning materials that can facilitate the implementation of UDL, and this is the last step of the designing process in which teachers are encouraged to "minimize barriers and realize the strengths and challenges each student brings to learning, rely on effective teaching practices, and apply challenges appropriate for each learner" (Stangman et al., 2005, p. 38). At the same time, they should revise their teaching based on students' learning progress or performance in order to ensure efficient application of UDL. This is embodied in the view that reflection on inclusive practices and learning to value student differences and diversity can help teachers identify opportunities to refine planning and teaching and thus create a more supportive learning environment for all students.

Assistive technology (AT) plays an important role in the implementation of UDL principles. Conventionally and still dominantly, AT is designed and applied to help disadvantaged students, such as those with disabilities, to overcome barriers in their surroundings or environment and to encourage independence. However, it is increasingly known that in education, AT can help achieve inclusive education for all students with different learning needs. This can be seen from the definition of AT that is the "hardware, software or system of technical components and processes that enhances the capacity for all students to engage more effectively with the curriculum and their learning environment" (Queensland Education, 2018, para. 2). In practice, UDL and AT are often used together to reduce barriers to learning, and this relationship is described by Rose et al. (2005) as 'two sides of the same coin', the integration and interaction of which can "achieve optimal and practical results" as well as inclusiveness in education (p. 509). This actually reflects the benefits of ICTs in supporting teaching and learning, such as developing literacy skills, increasing motivation in schooling, promoting active learning, independent learning, dynamic and collaborative learning and meta-cognitive learning, to name but a few (see, for example, Suryani, 2010). However, UDL and AT may sometimes refer to different things and cope with schooling from differing perspectives. For instance, the former emphasizes on the change of learning environment and curriculum when students cannot fit into schooling, while the latter is designed subject to students' special needs in a more unique, customized and personal manner. Due to the limited space here, the differences will not be discussed. Nevertheless, it must be acknowledged that when UDL and AT co-exist in schooling, inclusive learning that engages everyone could be enhanced.

Inclusive Education in Australia

Inclusive education has been embodied in Australia's educational practices for more than two decades, and its meaning has transitioned from "being exclusively about students with a disability to a now encompassing the delivery of a high-quality education to all students" who have different learning characteristics, demographic information as well as education needs (Anderson & Boyle, 2015, p. 4). Education in Australia is a complex one, as there is an increasing number of students who may be considered as disadvantaged or have distinct

experiences and additional learning needs. To ensure the quality of education, Australia is making a national commitment through legislation and explicit policy making. This endeavor reflects the aim to create an inclusive society that has inclusive schooling and education systems which engage every student into effective learning.

However, inclusion is far from being achieved in schooling across Australia (Anderson & Boyle, 2015; Black-Hawkins, 2017; Elvey, 2017). It is assumed that the notion of integration is still commonly held by schoolteachers and leaders, prioritizing the 'normalization' of disadvantaged students so that they are able to partake in existing schooling rather than inclusion that highlights the necessity for schooling to be adapted and reformed. For example, it is a common scene that students coming from the language background other than English are often pulled out from regular classroom for 'compensatory' literacy classes designed to help them fit into mainstream classroom. When coming back, they may seem too upset or exhausted to keep abreast of what is happening in class. This is just the case described by Baker and Wright (2017) that 'withdrawn' students "may fall behind on curriculum content delivered to others" with a sense of "stigma for absence…and feelings of alienation" (p. 291). Such endeavor to 'normalize' students actually reflects the idea of integration rather than inclusion, and marginalization still occurs in this regard. Hence, although inclusion is appealed for in Australia, there is still a long way to go to truly realize it in education and rectify the harsh fact that in Australia, "living with disability is nothing compared to living with exclusion" (Young, 2013, p. 256).

Methodology

Setting

The first case of COVID-19 in Australia was detected in January of 2020, followed by intermittent breakout till now. The state government of Victoria has introduced a set of restrictions in response to the pandemic, including the lockdown of education providers. The selected school, College X (pseudonym), is a public secondary school located in Victoria, Australia. Following the governmental instructions, College X shut down since March 2020 and began providing online courses of all disciplines to students who could continue their learning from home in a school setting. This research was conducted in the middle of 2020, when College X remained closed with online courses provided. The ICTs used for teaching were mainly Zoom (a cloud platform for audio-visual chatting and meeting) and Compass (an education management system that provides access to school emails, news, events, assignments, materials, academic reports, etc.).

Research Design

This was a mixed-methods study that was both quantitative and qualitative, aimed at generating deeper understanding of the issue being examined. School-based portfolio tasks were used to measure students' English proficiency, the results of which were marked by proficiency EAL teachers in accordance with certain rubrics. Besides, non-participant observation of teaching was conducted in order to examine the online learning context that students were put into. Semi-structured interviews with selected students were also organized though Zoom, which could enable the researchers to closely work with participants who could tell their own 'stories' of reality and help the researchers better understand the situation and the participants' actions. In what follows, the

analysis of quantitative data will examine the effects of UDL on students' English proficiency in online classroom, while the qualitative data will provide some clues, at least in a preliminary way, to explain the potential benefits that UDL have on students' learning experience.

Subjects

30 Year-10 EAL students — 22 females and 8 males — from College X participated in this research, with consent obtained from the participant students, school leaders and parents. All the students were overseas students in Australia, with a majority of them coming from China (n=25) and some coming from Vietnam (n=3) and India (n=2). They were of similar ages ranging from 16 to 17 and had similar years of English learning and schooling. 15 students were put into the treatment group addressed by Teacher A using UDL, and 15 students were categorized as the control group taught by Teacher B in regular EAL classroom. Teacher A and Teacher B were proficient teachers in secondary education and had similar education background and teaching experience, but Teacher A had undertaken professional training regarding the application of UDL in schooling before the research commenced. All the population was addressed with regard to observation and collection of portfolio task results, while only 10 were interviewed, and they were selected evenly from the treatment group and the control group. The interviewed students will be addressed by pseudonyms in the paper.

In accordance with the language proficiency levels indicated in the *Victorian EAL Curriculum* (Victoria Curriculum and Assessment Authority, 2019), all the participants students were considered by the school EAL leaders to be at Level C1 of Pathway C. Their portfolio task scores of previous semester were also analyzed through independent Samples T-test, the results of which suggested that the treatment group and the control group had similar English proficiency prior to this study (t=.967, p=.335). The statistical details can be seen in the following table.

Table 1. Statistics of Previous Semester's Portfolio Task Results of the Treatment Group and Control Group

	Treatment Group (n=15)		Control Group (n=15)			
Variable	**Mean**	**SD**	**Mean**	**SD**	**t**	**p**
Portfolio Task Result of Previous Semester	69.98	8.94	68.76	6.87	.967	.335

Results and Discussion

Quantitative Study

At the end of this unit of learning, the portfolio task of persuasive writing was organized to assess students' online learning performance. It can be seen from Table 2 that there was a significant difference between the overall learning proficiency of the treatment group and the control group (t=2.165, p<.05) in the portfolio task after this unit of online classes. Meanwhile, as shown in Table 3, the treatment group made greater process than the control group, though they had similar English proficiency levels prior to the study. Specifically, the treatment group developed their English proficiency in online classes from the mean score of 69.98 in previous

semester's portfolio task to 72.76 in this semester's one, with the control group also making a progress from 68.76 to 69.66 but in a slight manner. This trend of proficiency gains can be also seen in the following line graph.

Table 2. Statistics of Current Semester's Portfolio Task Results of the Treatment Group and Control Group

	Treatment Group (n=15)		Control Group (n=15)			
Variable	**Mean**	**SD**	**Mean**	**SD**	**t**	**p**
Portfolio Task Result of this Semester	72.76	9.86	69.66	7.53	2.165	.032

Table 3. Comparison of the Portfolio Task Results of Previous Semester and Current Semester

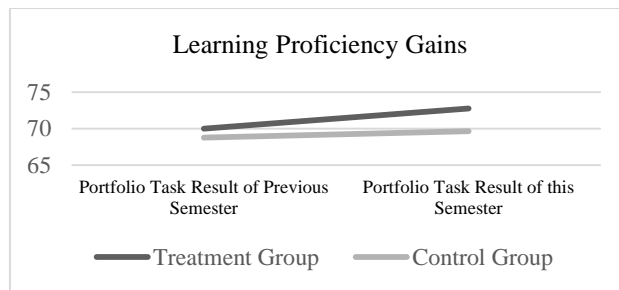|	Treatment Group (n=15)		Control Group (n=15)	
Variable	**Mean**	**SD**	**Mean**	**SD**
Portfolio Task Result of Previous Semester	69.98	8.49	68.76	6.87
Portfolio Task Result of this Semester	72.76	9.86	69.66	7.53

Figure 2. Learning Proficiency Gains of the Treatment Group and Control Group

Based on the analysis of quantitative data, it is safe to say that UDL had positive effects on the participant students' English proficiency when all the courses were delivered online. Compared with the regular EAL classes, UDL-based ones could be more beneficial and fruitful. Although the benefits of online learning have been long acknowledged, its effectiveness is still frequently called a question. According to Collins et al. (2019, p. 57), the biggest disadvantage of online learning may be "its lack of humanization, or the inability of faculty and peers to perceive each other as real, without the audio and kinesthetic clues afforded by face-to-face interaction" (see also, for example, Ostankowicz- Bazan, 2016), and such drawbacks may fail to engage students into effective online learning or achieve the expected learning outcomes. Amid the COVID-19 pandemic, the effectiveness of online learning has been posed a barrage of criticism with emerging challenges, such as lack of technological infrastructure and skills, inequality of education, interrupted supervision and assessment, heavy workload and so on. Although the Australian government has made religious commitment to providing technical help and ensuring the continuity of schooling and assessment (see, for example, State Government of Victoria, Australia, 2020), negative attitudes towards online learning efficiency tend to be a common occurrence, which can be seen from extensive coverage that discloses that online lessons are normally less

thoughtfully planned and prepared and that students feel less engaged with less satisfying academic performance in schooling. Admittedly, empirical and academic research needs to be conducted in secondary school settings to provide more reliable information about the reality of online learning amid COVID-19 — this seems to be a research gap in the context of Australia which has not yet been bridged — but it is safe to say that online learning experience could be disappointing when lessons are designed less thoughtfully. The present study firstly compares students' English proficiency gains in a UDL-oriented EAL classroom and a regular EAL classroom, and the positive statistical findings shed light on the feasibility of UDL in online learning context. It is impossible to maintain that UDL is the best for online learning or for the entire secondary education system in Australia, whereas at least, it can be claimed that UDL is one of the possible solutions to the quandary of online learning and provides a way for improving the quality of teaching and learning amid COVID-19.

Qualitative Study

Beside the quantitative data that indicates the benefits of UDL, the analysis of qualitative data is also needed to examine what occurred in the UDL-based class and the regular EAL class and how students learned or felt in differing classes. The students in the treatment group generally held positive attitudes towards UDL-oriented online classes, which could explain why they made more significant progress of English learning than those students enrolled at regular online EAL classes. In this unit, students in the treatment group were required to understand and analyze a persuasive issue out of four that were debated in Australia, including 'Should the copyright on Aboriginal flag be removed?', 'Should COVID-19 vaccination be compulsory?', 'Should schools be locked down due to COVID-19 pandemic?' and 'Should *TikTok* be banned from Australia?'. Students were allowed to choose one issue out of their personal interest or experience. For each issue, a list of texts of was prepared, and they were extracted from mainstream news websites (e.g. *The Guardian*, *ABC News*, *BBC News*, *The Conversation*) and were of different types (e.g. videos, news articles, editorials). Students could assess these materials through Compass and were allowed to choose any three texts out of the list to understand a specific issue and analyze it from the perspectives of '5Ws', including 'what the issue is', 'when the issue occurs', 'where the issue occurs', 'who is involved' and 'why the issue is debated'. Different assessment tasks were prepared to assess students' understanding, such as oral presentation, informative writing, debate and role-play, and these activities were mainly used for the purpose of formative assessment. Teacher A made good use of the breakout room function of Zoom when assessing students' performance and offering scaffolding by grouping students who analyzed the same issue into the same chatroom. The summative assessment of this unit was to construct a persuasive text based on one debated issue

It can be indicated that Teacher A provided students with different types of information, multiple choices and various assessment activities to achieve the required learning outcomes, and the whole learning process was student-centered and engaging and took into account students' potential differing learning styles. This is reinforced by the interviewed students in the treatment group, such as Student YH, Student AK and Student XL whose responses are as follows. Almost all the interviewed subjects mentioned the key feature of this unit, which was differentiation, and they also admitted that they found online EAL lessons interesting, engaging or effective when they were offered multiple means of representation, expression and engagement:

Student YH*: "The teacher used different types of information…This offered me different options to get (the) information I need…This is better than what we did in the last semester…completing hundreds of set readings."*

Student AK*: "There are different types of tasks. I can choose anyone I prefer to achieve the learning goals…The teacher also designed a lot of different activities to keep me on track…I feel online learning is…interesting and effective...and motivated to learn English."*

Student XL*: "My teacher provided different ways for us to complete our learning task. We can use our preferred way to finish our task…My friend and I chose to do a role play to present our understanding of TikTok ban. We had fun with it. We also engaged in the learning task. I feel really happy…and encouraged…in this way."*

While mentioning the benefits of UDL-oriented online learning, some interviewees also noted the ICTs that made such an involving online learning experience possible. Student CL's and Student AK's responses were typical, and they said:

"I have to use various new applications…New technology, especially education technology which I have never tried before challenges me a lot….But (now) I can use these applications properly to take online classes and do activities…Technology plays an important role in COVID-19...My teacher makes good use of the technologies to plan and give our lessons. Without it, it is never possible to have so many fun activities (in online classes)."

"I'm not a technology person…and (technology) means mumbo jumbo to me…(But) I have to learn to use technologies now…It's technology that makes my EAL lessons so excellent, isn't it?"

On the one hand, this may reflect the challenge that a number of students face during online learning, which is to handle the ICTs and make thorough use of AT functions to assist learning. On the other and probably more importantly, it was ICTs that made online learning functional and engaging, just as the participant students realized.

In comparison, the story for the control group is totally different. Students were required to understand and analyze a persuasive issue that was debated in Australia, which was 'Should COVID-19 vaccination be compulsory in Australia?'. In the first few classes, Teacher B introduced this issue in detail from the perspective of '5Ws'. The whole class was delivered as a lecture, and Teacher B was the main speaker who presented all the key information through a PowerPoint slide, though some students asked questions by the end of classes. To understand the persuasive issue more deeply, Teacher B selected three news articles from *ABC News*, which illustrated the issue in more detail, such as its cause and effect, current domestic and international situation, opinions from experts of different fields and so on. In the following lessons, students analyzed the articles with teacher scaffolding, presented their understanding of the articles by paraphrasing the key information and using quotes to justify their responses on a designed worksheet, and writing a persuasive text as the formal assessment task of this unit. Throughout the learning process, Teacher B seemed to be the dominator of learning with

students being the passive knowledge recipients and rigidly completing set activities. This is also reflected in students' interview responses, which can be seen as follows:

Student YT: *"There is very limited information I can choose…Teacher gives us (an) article from newspapers which is really hard to read...and it's boring."*

Student HW: *"All I need to do is reading, reading and completing worksheet…There is a lot of online reading, quoting and discussion…and writing."*

Student CZ: *"I hope there are more options for me to choose to learn, not just article which I need to read, read and read…I mean I already had a lot of reading task from other subjects…so I hope this class (would) be different and more interesting."*

The learning environment in the regular EAL classroom was oppositive to the UDL-based one, and there were limited means of representation, expression and engagement which were mostly teacher-centered. In such a learning context, there is no much doubt that students felt disengaged, bored or even unsatisfied, which can be seen from the following responses:

Student HW: *"I can easily tell the class routine (which) is the same every day. Teacher greets us as usual…Then slides (are) shown on screen and then the teacher starts the...Sometimes teacher will ask questions but there was a silence. I feel a bit hard to concentrate on the class when teacher is lecturing (at the other side of) the computer."*

Student CZ: *"I want to go back to campus…Online learning makes me tired and annoyed…It's wasting my time."*

Student ZW: *"I am not sure whether my learning is satisfied by the teaching, because everything is…decided and settled by the teacher. I take the class and finish the task…It is boring...(But) I have to do (it), and there is no choice."*

In the treatment group, both the classroom observation and the interview responses highlight the benefits of UDL in creating inclusive, flexible and differentiated online learning experience. Particularly, there is a high frequency of words indicating the interviewees' positive feelings and attitudes reflects that in a highly student-centered environment, such as 'interesting', 'effective', 'excellent', 'fun', 'motivated', 'encouraged', 'happy' and so on. This is opposite to the control group that was addressed by highly teacher-centered pedagogical approach with previously set learning activities and who expressed their negative attitudes towards online learning in interviews, which can be seen from the words like 'boring', 'annoyed', 'tired' and 'wasting time'.

There are two important points that can be drawn from the result of qualitative study. The first one is that in online learning context, the UDL can better engage students into effective learning compared with a traditional approach to planning and teaching. In the time of COVID-19 crisis, online learning tends to be the necessity to maintain the continuity of schooling and assessment, which is described by Dhawan (2020) as panacea to this

pandemic. However, this panacea is never perfect, and problems may occur with it. For example, students may find online learning boring or unengaging and thus be unable to focus on it; online course could also be too mediocre, theoretical or didactic, failing to maximize and make use of the full potentials and flexibility of online learning. In this regard, online classes "should be made dynamic, interesting, and interactive" with efforts "made to humanize the learning process to the best extent possible" as well as attention paid to students to help them fit into and make the best of the learning environment (Dhawan, 2020, p. 9). Apart from that, inclusion needs to be maintained, not only for those students who have special learning needs (e.g. lacking technologies, disabilities) but also for those who have differing learning styles — that is to say, a need to include everyone (Australian Coalition for Inclusive Education, 2020). To make online learning attractive and to engage every learner into effective schooling, there is an urgent need, as described by Adnan and Anwar (2020), "for academic organizations to improve their curriculum and the usage of new instructional methods and strategies should be of utmost significance" (p. 46). UDL is a proper response to such need. It is inclusive and engaging in nature, as fundamentally, it provides learners with multiple means of representation, expression and engagement in response to their learning needs or to the notion of differentiation. There is plenty of literature illustrating why UDL is inclusive and how engaging it is, which will not be reviewed and discussed here. But in light of the study presented in this paper, UDL can help students adapt to online learning environment and improve their learning efficiency compared with regular or probably unfavorable teaching approaches.

The other central idea drawn from this study is that ICTs, when used in a proper and utmost way, can pave way for the implementation of UDL in online classes. That is to say, ICTs or remote learning actually provide plenty of opportunities for UDL. A majority of the interviewed students suggested that it was ICTs that made engaging learning characterized by UDL possible amid COVID-19 pandemic, and indeed, the teacher in the treatment group did make use of the flexibility of ICTs to provide a variety of learning resources and organize engaging learning activities through Internet. This reflects the view that when information and learning materials are provided "in digital format, they can be easily changed and enhanced…, (offering) significant opportunities in considering, planning, and implementing UDL in digital…environments" (Dalton, 2017, p. 23). The Internet has provided numerous possibilities for education, without which online learning will be a mission impossible. However, Internet itself is never enough, just as maintained by Al-Azawei et al. (2017), online learning should be facilitated by productive pedagogical approaches to make learning accessible and satisfy learners' various needs. Likewise, the potentials of UDL can be maximized with the support of "the extensive capabilities provided by digital technology to transform information into varied formats…(and) to address learner variability", though UDL can be still implemented alone through non-technologg0related means (Dalton, 2017, p. 22).

Therefore, it is safe to say, just as Figure 3 illustrates, that there is a reciprocal relationship existing here under the circumstance of COVID-19 in the manner that online learning facilitates the use of UDL that in turn can also facilitate quality online teaching and learning efficiency. That is to say, online learning affords ample opportunities of using ICTs to facilitate the implementation of UDL, and UDL characterized by multiple means of representation, engagement and expression further supports online learning, especially inclusive online learning. In sum, UDL can be one of the possible solutions to the challenge that online learning tends to less

effective or inclusive than traditional learning on campus, and the implementation of it just seizes the opportunity that online learning opens up in the manner that learning and teaching activities become ICT-based. When implemented in totally online context, UDL is not restricted to ICTs or ATs; rather, it enhances the pedagogical approaches and instructional practices to maximize online learning experience and modern technologies that render massive online classes possible in the time of COVID-19 crisis.
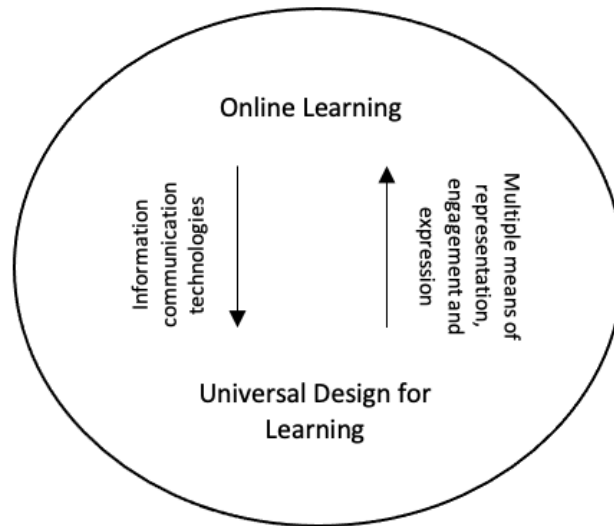

Figure 3. A Reciprocal Relationship between Online Learning and UDL

Limitation

A major limitation of this study is the small sample size. Although this research of experimental style can indicate the cause-effect relationship in a straightforward way, the research findings may not be generalized to the whole educational setting in Australia. Rather, they only provide teachers, educators and researchers with some thoughtful insights into online learning as well as one possible solution or initiative to optimize online learning experience. In the future, more detailed, in-depth, extensive research is needed to examine the effectiveness of UDL in Australian secondary schools.

Conclusion

The COVID-19 pandemic has challenged the traditional setting of education and made inclusion in schooling a vital aim to be achieved in online learning experience. It is never an easy task to address all the students' learning needs at once, and there is no one-size-fits-all strategy, either. However, teaching and learning online with the assistance of a variety of ATs or ICTs can afford ample opportunities or space for the implementation of UDL which in turn can engage students into effective learning and maximize the role online learning plays under such a special circumstance. Therefore, through a rather optimistic lens, online learning is the opportunity to implement UDL, and UDL is the solution to enhance online learning. In the present study, the effectiveness of UDL was explored with EAL students in a particular Australian secondary school. The positive research

findings, such as English proficiency gains and favorable attitudes to online learning, shed light on the potentials of UDL in improving online learning efficiency and guaranteeing desirable online learning experience and quality. It is impossible to conclude that UDL is the best for all the disciplines or for the entire secondary education system in Australia, as indeed, this study was conducted only in one school with limited number of students enrolled in EAL courses. However, it is at least safe to say that, just as mentioned earlier, online learning opens up opportunities for the use of UDL that can be one of the plenty of solutions or ways to promote inclusion in online learning. Upon the construction of this paper, secondary school students in Australia have started to return to campus to continue schooling, temporarily but hopefully completely calling an end to online learning from home amid COVID-19 pandemic. However, there are still many countries or regions around the world where remote learning still continues with school lockdown frequently occurring. Out of this paper, the reciprocal relationship of online learning and UDL is probably the most valuable insight for teachers, school leaders, educators and other stakeholders who are still working on inclusive education in COVID-19.

Acknowledgments

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