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Chapter

A Review of Digital Learning and ESL Online Classroom Experience in Higher Education

Noble Lo

Abstract

Whilst universities across the global community had adopted new digital learning standards prior to COVID-19, the radical effect of quarantines and social distancing on remote learning needs has fundamentally altered the structure of modern English as a second language (ESL) education in higher education institutions. The current investigation critically explores the educational paradigm from a perspective of content dissemination, learning best practices, and knowledge acquisition in Hong Kong colleges and universities. Through a critical review of the literature surrounding digital learning challenges and opportunities, evidence revealed an overlapping proposition of adaptation and discipline which many students lacked prior to the COVID-19 interruption. By comparing the perspectives of 1062 students across ESL programmes taking English for academic purposes (EAP) and English for specific purposes (ESP) courses within several Hong Kong institutions, this study has confirmed the potential advantages of digital learning solutions including time management, self-paced learning, and knowledge engagement. Students were surveyed using a digital, structured questionnaire to capture a robust representation of experiences during the COVID-19 pandemic and their effects on student learning outcomes. Through quantitative analysis, student feedback has confirmed several developmental challenges related to skills gaps, personal discipline, environmental forces, and student learning expectations. Based upon these findings, a revised protocol for digital citizenship has been proposed which focuses on core principles of self-accountability and discipline that evolve out of proactive, motivated learning objectives that link students to their digital identity and role. Ultimately, these observations indicate a need for future assessment of the competing motivations shaping student engagement in digital learning services and traditional classroom offerings as the COVID-19 pandemic restrictions are lifted and the educational industry evolves towards its new normal.

Keywords: digital learning, content dissemination, learning practices, ESL education, autonomy
1. Introduction

1.1 Research background

As universities have strategically evolved their operational approaches to reconcile the emergence of digital learning standards following the COVID-19 pandemic, the effects of quarantine expectations and social distancing requirements have fundamentally altered the structure and need underlying modern ESL education in higher education. Whereas traditional teaching strategies have involved front-facing, physical educational environments with students dispersed across large classroom environments, Coniam et al. [1] observe that digital solutions have resulted in a ‘blended form of learning and teaching’. Recognised as a ‘new phase’ or evolution of modern higher education, Oraif and Elyas [2] suggest that the sudden and significant push associated with COVID-19 has fundamentally altered the structure and systemic efficiencies of the educational ecosystem. For learners experienced in traditional educational environments, however, the shock and suddenness of the online transition raise multiple questions regarding the efficacy and sustainability of this radical shift in networked education.

For English as a foreign language (EFL), the systemic evolution of the technological landscape towards digital capabilities offers distinct advantages that have the potential to reshape the structure, efficiency, and effectiveness of language learning [3]. Early research in the field of digital language learning presented by Kryukov et al. [4] predicted that there would be a significant challenge in designing effective content and multimedia resources that would provide students with an engaging and motivational solution. Yet, as Lo and Mok [5] have demonstrated, the evolution of digital learning capabilities through gamification and interactive digital ecosystems has facilitated a paradigm shift away from utilitarian, list-based designs towards an engaging, meaningful, and adaptive digital environment. Recent evidence presented by Pobegaylov [6] and Rahman [7] confirms a range of systemic advantages and learner benefits arising from the digitalisation of EFL learning, whilst also highlighting the challenges arising from new skill sets, knowledge bases, and online responsibilities related to the COVID-19 pandemic. Based upon such findings, a review of the recent empirical research regarding EFL learning and online migration of higher education courses following the COVID-19 pandemic reveals an array of academic interest and varied empirical results from nations throughout the Middle East and Southeast Asia. However, a comprehensive database search for Hong Kong EFL reveals a significant empirical gap that has been remedied over the course of this study by focusing on inside stakeholders within this geographically integrated student population.

1.2 Research aim and objectives

The primary aim of this research was to critically assess the transition to digital learning in Hong Kong-based ESL higher education during the COVID-19 pandemic in order to determine the effects of digital citizenship and self-discipline on student experiences and learning outcomes. Through a combination of a theoretical review and empirical analysis, the following core research objectives were accomplished:

• To analyse the demands of digital learning, assessing the roles of self-paced study and pedagogical support in ESL education.
• To interpret the transformative effects of COVID-19 on learning objectives and dig practices in ESL education.

• To analyse the characteristics of digital citizenship and student autonomy in digital learning environments.

• To recommend a protocol for student-oriented digital citizenship and self-accountability to improve future digital learning outcomes in Hong Kong higher education.

1.3 Research questions

There were several questions that were answered over the course of this exploratory investigation:

• What were the primary challenges associated with transitioning higher education from traditional classroom settings to a digital learning ecosystem following COVID-19?

• What challenges have students encountered in transition into digital learning, and how have digital citizenship and self-accountability enabled positive performance outcomes?

• What support systems or pedagogical influences are needed to improve student learning outcomes in the future?

• What are the next steps for Hong Kong ESL programmes to support a new digital learning paradigm for the next generation of remote learners?

1.4 Research overview

This chapter has provided an overview of the transformative forces affecting the Hong Kong higher education ESL programme during the COVID-19 pandemic and the challenges and opportunities associated with digital education and learning processes. The remainder of this dissertation progresses from a theoretical and conceptual overview of digital learning to a critical assessment of empirical evidence related to ESL students and their experiences with the transition from traditional to digital learning practices. Through this synthesis of evidence, focused conclusions are drawn regarding the current and future evolution of the digital learning agenda.

2. Literature review

2.1 Online education and digital pedagogy

Providing justification for an emergent field of online education, McKnight et al. [8] originally identified five primary roles of technology in developing the learning environment including improving teacher and learner access to e-resources, improving communication between teachers and learners, providing flexible time arrangements, expands learner skill sets and discipline, and creates new, innovative
roles for teachers and learners. The COVID-19 pandemic persistence has allowed or forced higher learning institutions and stakeholders to adopt contemporary technological tools for education delivery. The pandemic is fairly a plus for digital pedagogy implementation. For EFL courses, Hazaymeh [3] observes that there are multiple functional advantages ranging from accelerated distribution of course content to innovative learning materials to knowledge sharing and social information exchange. In a technological assessment, Lo [9] highlights the advantages of authentic language learning using visual cues, digital audio, and artificial intelligence (AI)-supported assessments to test student abilities. Whereas traditional lecture-based classrooms relied upon teacher demonstration and student exercises, digital learning has the potential to provide a more immersive experience upon innovative modules, educator creativity, and interactive student experiences [9, 10].

Therefore, Kodlrle and Savchenko [11] propose that the conversational and interactive advantages associated with multimedia EFL applications are conducive to ‘favourable communication’ practices that are not only integrative but are directed towards a practical translation of knowledge into meaningful real-world outcomes. Within this digitalisation paradigm, Lo and Mok [5] describe a concept of ‘paratextuality’ in gaming which transfers to language 2 (L2) acquisition in the form of consumption and production of linguistic themes, textual representations, and representations like art and/or imagery. From word association to goal execution to dialogue construction, the familiarity of digital natives to the paratextual experience in online gaming has direct and transferrable relevance in digital L2 learning experiences [5]. Similar recommendations for an emergent digital ecosystem in EFL learning proposed by Rahimi and Yadollahi [12] suggest that digital storytelling and exchanges allow learners to ‘develop their language literacy’ by engaging in collaborative reinforcement exercises and ‘constructive dialogue with teachers and group-mates.’ Whilst such group activities have been widely used in traditional EFL settings, the digitalisation of this experience not only accelerates the participative process but can use feedback mechanisms and digital prompts to reinforce student language proficiency (Rahimi & Yadollahi [12]).

2.2 Digital citizenship and self-accountability in online learning

For students entering into the digital ecosystem, Yilmaz [13] proposes that adaptation will be determined by key characteristics of digital citizenship such as digital self-efficacy, self-directed learning, and accountability. Central to the success in a digital ecosystem is the core concept of digital citizenship which involves the appropriate use of technology and the student commitment to behaviours and practices that support their own learning pathways as they evolve online [14]. Whereas traditional assessment has involved proctored settings, rigorous oversight, and clearly defined classroom controls, the digital alternative often shifts accountability and ownership away from the institution and into the hands of the student [1]. Online proctored exams, for example, can utilise digital monitoring resources and videoconferencing to maintain oversight during the testing process, whilst also allowing students the flexibility to complete critical coursework from the ‘comfort and safety of their own home’ ([1], p.59). Students immersed in digital environments are exposed to holistic learning outcomes that often involve pragmatic search behaviours and self-supporting activities that can lead to challenges during rigorous assessments and explicit testing requirements [7]. At the same time, Little and Al Wahaibi [15] have demonstrated empirically that if students have a clear understanding of the
requirements and expectations of the course and the assessment procedure, their self-determination, and motivated autonomy will allow them to engage more productively in the range of requirements associated with these new digital ecosystems.

Evolving far beyond the simplistic, list-based database solutions observed by Kryukov et al. [4], modern digital learning has adopted a gamified, engaging, and immersive content platform to the accommodation of varying student learning needs. Yet, following the suddenness of the COVID-19 pandemic, the shift from traditional to completely digital education across these Hong Kong institutions has radically altered the learning approach adopted by these EFL students. Yilmaz [13] proposes that core dimensions of e-learning readiness such as digital self-efficacy, self-directed learning, and accountability predict whether students are able to transition into a productive digital ecosystem. Similarly, McWilliam and Dawson [10] have observed the need for educators to engage in more creative and immersive pedagogical strategies, drawing upon an exchange of creative capital to actively engage students in the digital learning process. The findings in the current study have confirmed that students who identified as digital natives and who were experienced in school (e.g. higher enrolment level) were more likely to integrate seamlessly into the digital learning experience.

Central to the effectiveness of digital EFL programmes is an immersiveness that forms the basis for the proposed protocol for designing and implementing future programmes that encourage student performance and engagement. To improve the effectiveness of the digital EFL experience, Rahimi and Yadollahi [12] and Lo and Mok [5] propose that advanced digital storytelling technologies are providing immersive advantages for the gamification and participation enhancement of the language learning process. Figure 1 extrapolates the four core dimensions from the conceptual framework and incorporates multiple assessment dimensions that can be used to ensure that EFL teams are meeting the needs of their students and their instructors. For example, students’ technological skills must be assessed prior to classroom immersion as well as the resources they have available or may need to purchase. Once students have received adequate training, then expectations must be set regarding digital citizenship.
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and the role of self-accountability in shaping student performance. Instructors will leverage multi-channel communication strategies (e.g. e-mail, telephone, and Zoom) to meet student needs and respond effectively, whilst adopting creative delivery strategies for videoconferencing and engaging coursework. Finally, to ensure that the immersion is comprehensive and sustainable, the EFL education curriculum needs to be gamified.

2.3 COVID-19 and online learning effects

The suddenness of the shift from traditional to digital learning was surprising to many higher education students, with Rahman [7] reporting that despite their experience with digital technologies (e.g. home computing, mobile applications), many adjustments to behaviours, awareness, and skill sets were needed during this process. In a small sample interview of students at the higher education institution, UKI Toraja, Allo [16] observed a variety of positive responses to the sudden shift from traditional education to online learning. Whilst some students reported experiencing cost and resources-related challenges, the acknowledgement of the advantages of persistent digital learning despite widespread disruption during the pandemic in other industries was viewed as positive [16]. Students reported a need for instructor awareness regarding technological, material, and access-based challenges in relation to the online curriculum and course scheduling; however, through social networks and peer support, many hurdles were overcome [16].

Central to the functional advantages of online learning, support for remote or distributed students offers a distinct advantage that not only empowers more students to participate in the digital ecosystem but expands the adaptability of classroom systems during unprecedented events like COVID-19 [3]. Further, Lo [9] acknowledges that authenticity and interactivity via the virtual ecosystem encourage students to engage in experiential learning that offers a significant advantage over traditional, coursework-focused learning experiences. Of the students who completed this study, just 32.7% indicated that they would not be satisfied with online learning in the upcoming semester despite minor improvements in the overall perceptions regarding the effectiveness of online teaching and the assessment process. These findings suggest that during this transitional period, the catchup procedures at these universities and inadequate levels of student support may have negatively affected the overall satisfaction with the online learning experience.

Despite positive assessment of students’ ability to adapt to the digital learning experience by Allo [16] and Rahman [7] other evidence in this field suggests that the transition has been challenging for both students and teachers. For example, Pobegaylov [6] reveals that due to online switching, instructors have been unable to ‘provide their educational influence’ and leverage their pedagogical skill sets to instruct students via online courses in the same ways that they would have demonstrated in traditional classes. Students without the prerequisite skill sets, alternatively, have found their transition into digital learning a difficult process, one which has resulted in frustration, poor performance, and pathway uncertainties [6]. Whilst Yilmaz [13] has proposed that digital readiness is a function of digital citizenship and adaptation to changing online environments, gaps in the prerequisite skills and competencies needed to improve student learning outcomes may result in what Hava [17] has identified as frustration, discontentment, negativity, and resistance to change. Key concerns such as the time-consuming nature of the education process, the difficulty of the digital ecosystem, and the meaning versus the value of the digital content can lead to student frustrations and an inability to transition into more productive EFL outcomes [17].
2.4 Conceptual framework

Based on these findings, there are several core concepts that form the basis for the interpretive framework of digital EFL outcomes in higher education:

- **Technological Innovation**: Adaptive, creative, and innovative technological solutions designed to address student learning needs, incorporate multimedia communication, and disseminate curricular materials [3, 8].

- **Digital Citizenship**: From self-awareness to self-efficacy, a commitment to digital learning that involves autonomy, participation, and accountability [1, 13].

- **Support and Pedagogy**: The foundation of the educational process, instructors form the support basis for student problem-solving and guidance leveraging creativity and question-answering to navigate the curriculum [7, 16].

- **Engagement/Immersion**: Active participation of students (individual and grouped) in the educational process; engagement between instructor and students; gamification and immersion in EFL content [17].

3. Research methodology

3.1 Research paradigm

In the field of educational studies, much of the research has involved the exploration of diversified population samples and comparative evidence from a range of insider perspectives via surveys or focus groups [18]. Derived from a positivist paradigm, these forms of quantitative, factor-based, instrument-constrained studies allow researchers to apply deductive reasoning to the interpretation and analysis of empirical findings in order to prove or validate a central theory [19]. For example, Coniam et al. [1] recently assessed the effectiveness of online proctoring in EFL examinations, weighing candidate experiences and attitudes in relation to graduate-level university programmes. Alternatively, researchers in the field of social sciences will often adopt a constructivist paradigm to critically compare theoretical propositions with a range of experiences and/or observed behavioural outcomes [20]. Allo [16], for example, relied upon the administration of semi-structured interviews with a discrete sample of students in EFL studies at UKI Toraja to assess the effects of COVID-19 on student learning outcomes. Whilst this approach can allow for a deeper, personalised insight, Bryman [19] reminds that due to the subjectivity of the participants’ positions and the risk of evidential bias, constructivism can lead to significant reliability and validity issues.

For the current study, each of these philosophical positions was weighed, with emphasis placed upon the core problem (e.g. online schooling following COVID-19) and the most effective sources of evidence (e.g. participant insights and feedback). Whereas interviews might have illuminated individual perspectives, the lack of research surrounding Hong Kong university student experiences suggested that a larger scale study was needed, and for this reason, a narrow, qualitative interview would not meet the objectives of the study. Instead, a large-scale, comparative survey was needed to assess the perspectives of Hong Kong EFL students in relation to the effects of COVID-19 on digital learning processes, their effectiveness, and the
challenges of online EFL education. Therefore, this study has adopted a positivist lens, relying upon a structured, quantitative survey instrument to capture evidence from a large sample of Hong Kong EFL students.

3.2 Research approach

The design of the survey instrument for this study was based upon an extrapolation of several concepts from the literature review including learning disruption, student resources, assessment effectiveness, and educational outcomes. To ensure comparability, the instrument was structured into multiple sections which included the following core elements:

- Section 1: Demographic Overview: A review of general student demographics and digital education experiences that formed the basis for the independent variables.
- Section 2: Pre-COVID Assessment: A review of student perceptions of digital learning prior to COVID-19 using a 5-point Likert-based instrument to grade responses.

Where three of the prompts offered write-in responses relating to student experiences during digital learning, the open-ended feedback was aggregated and compared for similar themes. The survey was designed to be administered to students remotely via a dedicated SurveyMonkey link that was standardised and pasted into e-mail communications. The procedure involved identifying a possible sample population, distributing a targeted query letter to students, capturing evidence, and normalising and analysing the findings. The extensive data was analysed categorically to match the research objectives in technological advancement, challenges, and future projections and recommendations.

3.3 Sampling and participant selection

The purpose of this study was to capture evidence from inside stakeholders at Hong Kong-based universities. Accordingly, the large sample of 1062 participants was attained from a multi-stage distribution of a standardised, structured survey to more than 2000 university students currently studying at eight different Hong Kong higher education institutions. By applying this opportunistic sampling approach, the robust sample size and breadth of student characteristics and traits have ensured that the findings are both representative and generalisable in their assessment of student perceptions and experiences [19]. Results that were incomplete were excluded from the output unless the lack of a response was appropriate given the prompt.

3.4 Ethical concerns

Central to the efficacy and reliability of the research, Wallen and Frankel [21] observe that ethical responsibility is of paramount concern, directing oversight and administration to protect the rights and welfare of the sample population.
Nonmaleficence, the prevention of harm to participants in a given study, is identified by Punch [22] as a core expectation of any primary research technique. In this study, harm was mitigated by ensuring anonymity of the participants throughout the survey completion process, a condition which Babbie [23] argues will not only limit exposure and threat to survey-takers but will encourage more open, honest responses from the sample population. Prior to completing the survey, all participants were provided with a standard query letter that outlined the conditions of the study including their at-will participation and anonymity and the purpose of the research (e.g. academic only) [24]. The results were analysed using structured, quantitative techniques to reduce the potential for subjective interference, and the participants were encouraged to refrain from including any revealing information in the open-ended segments to maintain analytical consistency and comparability.

4. Results and discussion

4.1 Survey findings

The survey instrument was comprised of several overlapping sections with comparable metrics purposefully structured to elicit experiential feedback related to digital learning during COVID-19. The following sections subdivide this presentation into the core elements including the demographic overview and the core perceptions of the outcomes of digital ESL learning.

4.1.1 Demographic overview

The first series of prompts focused on the demographic categorisation of the participants, targeting grouping variables that could serve as independent dimensions to weigh against other perceptual biases. Despite the large sample size (N = 1062), there was a relatively equitable grouping between male (51.9%) and female (48.1%) respondents. In contrast to this broad gender representation, Figure 2 visualises a highly biased age range distribution that was based upon the sample targeting and selection procedure.

From a programme perspective, Figure 3 visualises the distribution of the participants’ enrolled status, with 63% in associates degree or higher diploma undertakings.
and 34% pursuing a bachelor’s degree. Through a Pearson’s correlation analysis, a strong ($PC = 0.167$, $P = 0.00$), a positive correlation was observed between age and programme, suggesting that older participants were more likely to be pursuing higher level degrees. In fact, a crosstabular analysis revealed that 75% of the participants aged 31–45 were pursuing a Bachelor’s degree or higher.

To classify the participants according to their technological acumen, Figure 4 visualises their distribution between technological natives, immigrants, and unknown status. As predicted, there was a direct correlation between the participant age range and technological status ($PC = 0.243$, $P = 0.000$). A crosstabular analysis revealed that no participant over the age of 31 identified as a technological native and just 25% identified as a technological immigrant. The remainder were unsure about their classification. In contrast 72.8% of the participants aged 18–30 identified as a technological native which is appropriate for their Gen-Z and Millennial classification.

The subsequent prompts focused on student experiences in ESL learning, starting with contact hours, as visualise in Figure 5.

This model reveals that 92% of the participant sample received between 2 and 3 contact hours for English lessons each week ($M = 2.85$, $SD = 0.633$). Given the high degree of conformity, it can be generalised that most Hong Kong university students can expect between 2 and 3 hours of pedagogical contact each week.
To achieve their learning objectives, Figure 6 highlights the spatial resources adopted by these participants with 62.1% indicating that they maintained a private space whilst 33.8% utilised a semi-private or shared space. This bias was expected as it reflects the use of a personal room or private office within a participant’s household that can be dedicated to digital learning when needed.

Classifying these spaces according to their specific characteristics, Figure 7 confirms that 62% of the students utilise their bedrooms, whilst 13% use sitting rooms and 11% use the dining room. Participants who had identified using public spaces were
most likely to indicate a classroom or study area whilst other spaces such as sitting and dining rooms were equally distributed across public and private classifications.

Despite the majority of the participants indicating that they retain a private space, as visualised in Figure 8, just 41.8% of the respondents indicated that their learning space was ideal or adequate. There was a negative correlation between the type of space (public or private) and the perceived adequacy of the learning space (PC = -0.116, P = 0.000). Despite predicting that public spaces would be perceived as inadequate, the six participants who reported that their space was not adequate at all indicated that they learn in private spaces. Further, 57.8% of those identified that their space is inadequate to study in private spaces. Overall, however, just 26.7% of the respondents who study in semi-private spaces and 57.1% of those who study in public affirmed their spaces as ideal or adequate. Of the 48.5% of the respondents who had changed spaces during the past learning period, 90.7% indicated that they had moved more than twice, indicating that they were forced to move due to various causes or they valued mobility.
A review of the existing equipment reported by these students for online learning revealed that more than 60% used some form of mobile computing device such as an iPad or laptop whilst the remaining students utilised a dedicated workspace in the form of a desktop computer. 61% of the sample did not need to acquire any additional equipment to participate in online learning. For the other 39% that did invest in new equipment, the responses indicated one of three primary resources including an iPad or tablet, a webcam, and/or a pair of headphones (with mic). As visualised in Figure 9, most of the participants who invested in new equipment (62%) were funded or sponsored by their families, whilst 37% were self-funded. Institutional sponsorships were entirely absent, supporting just six participants out of the total sample.

The participants were asked about the quality of training and support provided by their institution (Figure 10). A total of 34% of the 900 participants who answered this question felt that such support was good or exemplary, whilst just 8% felt that it was poor or not very effective. There was a strong statistical correlation (PC = 0.237, P = 0.000) between the experience of a problem (38.9% of the sample reported a problem) and the perception of university support/training. Problematically, the participants who had experienced problems were more likely...
to report the support and training as poor or not very effective than those who had not experienced a problem. When assessing the range of problems experienced by the students, the core themes included network problems, delays in communication or responses, and camera/Zoom issues. From a more experiential perspective, many participants indicated that they missed the traditional interactions with their instructors and students during digital learning.

4.1.2 Perceptions of digital learning in ESL

Although it was predicted that there would likely be a high degree of the experiential effect associated with the online learning experience for these ESL students, Figure 11 highlights the high level of congruity between the pre and post-online learning perceptions. The mean response for pre-COVID-19 attitudes towards online ESL was 3.31 (SD = 0.836), whilst after the courses migrated online, the mean attitude was 3.27 (SD = 0.916), a slightly lower perception.

Figure 11.
Student attitudes towards online learning before/after COVID-19.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Gender</th>
<th>Programme</th>
<th># Classmates</th>
<th>Technological Native</th>
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<tbody>
<tr>
<td></td>
<td>F</td>
<td>P</td>
<td>F</td>
<td>P</td>
</tr>
<tr>
<td>Before the COVID-19 outbreak, what is your attitude towards online English learning?</td>
<td>6.880</td>
<td>.009</td>
<td>10.913</td>
<td>.000</td>
</tr>
<tr>
<td>After your class was switched to online mode due to the COVID-19 outbreak, what is your attitude towards the effectiveness of assessment in online learning environment?</td>
<td>23.900</td>
<td>.000</td>
<td>13.385</td>
<td>.000</td>
</tr>
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Figure 12.
One-way ANOVA test of statistical significance attitude.
The one-way ANOVA test results revealed that there were several statistically significant relationships between four of the independent variables and these two dependent prompts (see Figure 12). In terms of gender, the evidence indicated that prior to the COVID-19 pandemic around 16.5% of female participants and 9.8% of male participants were not at all or not very interested in online learning. Following the shift to online learning, 20.7% of male participants and around 17.6% of female participants were not at all or not very interested in online learning. Although small, this shift continued in relation to programme of enrolment, whereby higher level (e.g. Bachelor’s, Master’s) learners were more likely to be interested in online learning before COVID-19, but less likely to remain interested after their online experiences. The relationship with the number of classmates was statistically indistinguishable via crosstabular analysis with one shift in perceptions cancelling out the others. However, where individuals who identified as technological natives were most likely to be interested in online learning prior to COVID-19, a larger number of ‘not sure’ participants migrated towards a positive orientation, likely gaining confidence from their experiences.

Figure 13 presents the results of four prompts related to the perceived effectiveness of online learning before and after COVID-19. Similar to the responses to the prompts in Figure 11, there was a high level of congruity between the two periods of response with the mean effectiveness of the online learning environment before COVID-19 identified as 3.03 (SD = 0.911) and the assessment of the effectiveness of online teaching after COVID-19 was 3.20 (SD = 0.884) after COVID-19. From an assessment perspective, the mean effectiveness before COVID-19 was 3.08 (SD = 0.886) and after COVID-19 it increased to 3.22 (SD = 0.859).

The ANOVA test (Figure 14) revealed a similar range of statistically significant relationships between four core independent variables and these targeted prompts. Prior to COVID-19, 33.2% of the male participants and 23.5% of the female participants felt that online learning was not effective. However, after COVID-19, 22.8% of the male participants and just 15.3% of the female participants felt that the online

Figure 13. Perceptions of effectiveness of online learning before/after COVID-19.
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assessment programmes were not effective. Prior to COVID-19, 20.7% of the male participants and 25.9% of the female participants felt that online teaching would not be effective. After COVID-19, whilst the male participants stayed relatively the same with 21.4%, just 15.3% of the female participants felt that the teaching was not effective, a substantial improvement over predictions. From a programme perspective, Master’s degree and to a lesser degree, Bachelor’s candidates did not find online assessments or teaching to be as effective as those in lower-level programmes. There was an experiential shift in these findings, where the optimism for both higher-level graduate degree programmes was erased and effectiveness was not perceived at these higher levels. Whereas statistical significance in relation to classmates could not be explicitly defined, when assessed via crosstabular comparison, technological natives were most likely to find online teaching and assessment effective, whilst immigrants were the least likely, suggesting an experiential advantage for technological natives.

The study involved data collection from 1062 student respondents; a relevant sample size in representing the whole Hong Kong student population. About 98% of the respondents belong to the ages ranging from 18 to 30 years. While the figure might illustrate the overall age distribution of Hong Kong-based students, it might also slightly reveal different age groups’ perceptions. The same conclusion can be observed from the respondents’ programmes with 97% undertaking degree or lower programmes and just 3% undertaking masters or a higher level. The figures are effective in projecting future perceptions as a significant number of respondents will likely undertake higher programmes after the pandemic.

Contemporary technology adoption was viewed as a minor challenge with just 10% claiming to be technological immigrants during the pandemic. 71% were confident of their technological experience while the rest 19% that claimed to be uncertain of their technological status could gradually settle on either side from experience. The study revealed an average of 2–3 contact hours of online learning compared to an average of 4–5 during face-time learning. While the slight time difference can be rendered insignificant since some students experienced on average the same kind of contact hours in previous face-time learning, most of the respondents claimed to miss the social experience of a classroom setup. The perception proves students’ reluctance to adopt online learning as a solo education delivery system but rather in conjunction with face-time learning. For most Hong Kong students, learning space was less of a challenge during online learning with about just 14% utilising public spaces. However, the 86% that enjoyed privacy privilege lacked social interactions essential in the former face-time setup. Consecutively, only 41.8% were confident of their learning spaces’ adequacy with the majority utilising

<table>
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<td>P</td>
</tr>
<tr>
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<td>23.900</td>
<td>.000</td>
<td>22.711</td>
<td>.000</td>
</tr>
<tr>
<td>After your class was switched to online mode due to the COVID-19 outbreak, what is your attitude toward the effectiveness of online teaching?</td>
<td>9.065</td>
<td>.003</td>
<td>35.510</td>
<td>.000</td>
</tr>
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</table>

Figure 14. One way ANOVA test of statistical significance effectiveness.
public places followed by private and semi-private in that order. In search of ideal learning spaces, over 48% had shifted spaces with more than 90% of those having moved more than twice. After the pandemic, public online learning places are seemingly ideal to support the education mode in the long term. The migration is also proof of students’ keenness towards the adoption of digital pedagogy in the education system.

A total of 61% of the respondents already owned the necessary equipment to facilitate online learning prior to face-time learning suspension. Of the remaining 39%, the students and their families facilitated the purchase of required equipment with little assistance from the institutions. From the figures, students have proven to orient themselves into digital citizens, a factor necessary for online learning implementation. Despite institutions withholding support in the purchase of equipment, most students agreed that they were handling their part in delivery effectively. The ANOVA test proved a considerable shift in the perceived effectiveness of online learning from the pre-COVID to post-COVID era. The shift might be caused by the forced face-time learning suspension or the result of online experiences so far. Nonetheless, the shift can be utilised as a basis for online learning persistence after the re-adoption of face time ESL learning.

5. Conclusion

While a number of students were interested in online learning prior to COVID-19, the study showed notable interest from more students after the pandemic. Most of the interested students are in the generation z and millennial groups which provides support for the use of online learning to back face-time learning in the future beyond the pandemic. The students noted capability in technological status towards online learning with the system just lacking a social touch. Thus, online learning will persist in being an essential tool for ESL education delivery in Hong Kong during and after the pandemic. Institutions and students are unlikely to give up technological advancements and contemporary tools adopted through the online learning platform also due
to improved perception of the mode's effectiveness. Currently, the primary supporters of online learning pursue a degree and associate degree programmes which is a basis for future preference of the mode by students undertaking higher programmes. The study supports the adoption of online learning and digital pedagogy to associate face-time learning in the long term as the standard mode of education delivery.

The study has a few limitations. First, the data was collected from Hong Kong universities and colleges students and is thus limited to an economic and technologically advanced setup. Second, the results were limited to students’ perceptions which leaves a gap for other stakeholders like teachers and institution administrations. Also, the effectiveness of the learning system cannot be properly assessed as the ultimate outcome will be observed during career executions in the future. Thus, the author recommends research persistence on the topic from other stakeholders’ perspectives and developing countries’ setup (Figure 15).
References


