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## AFFORDANCES IN EDUCATIONAL TECHNOLOGY: PERCEPTIONS OF TEACHERS AND STUDENTS IN OMAN

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### ABSTRACT

Aim/Purpose	This study of affordances in educational technology focuses on how the self-perceptions of teachers influence the creation of educational opportunities and how these are received by learners.
Background	It is important to explore the affordances offered by teachers, when using educational technology, from the perspective of their students. Within this topic, the interface of the educational technology affordances with the two agents—teachers and students—has often been neglected. Hence, the learning possibilities in educational interactions for the learners cannot be separated from the interactional possibilities created by teachers. The extent to which teachers can create opportunities to address their students' needs, while effectively conveying the value of these opportunities to their students, is likely to impact on how well these affordances for learning and collaboration are utilised.
Methodology	A survey that includes two questionnaires was used. The questionnaires were circulated to 102 teachers and their 354 adult students in six higher education institutions in Oman. The questionnaires were analysed by SPSS Amos v20 for statistical measures such as mean, standard deviation, and correlation.
Contribution	The study contributes to the field of e-learning because it demonstrates that the affordances offered by teachers for e-learning have an impact on the possibilities for students to engage. Both affordances were found to be highly correlated statistically. Further, teachers were found to primarily use the lowest level of engagement for online tasks, requiring low levels of cognitive challenge and social involvement from the learner.
Findings	The results indicate a low to medium level of self-directed learning that significantly correlates with perceptions of teaching possibilities for learning interactions.

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Recommendations for Practitioners	Teachers are encouraged to vary approaches to student engagement in online teaching materials such as enhancement, additional engagement opportunities, and extension so that students are encouraged to use different cognitive abilities and capabilities to engage in social interactions.
Impact on Society	This study presents a strong recommendation with regards to extending the online affordances towards social interactions of learning beyond the boundary of the classroom.
Future Research	Further studies on e-heutagogy and affordances of both teachers and students are needed. The effect of teachers created opportunities on students learning actions is an area that grants further investigation.
Keywords	educational technology affordances, teaching possibilities, possibilities for learning interactions, e-learning, self-directed learning

## INTRODUCTION

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The field of educational technology requires ongoing development, as technology is an inherent part of modern life (Aydin et al., 2019) and creates global demands. Linking this to learning English is particularly important in Oman where English is taught as a foreign language and there is an ongoing drive by the Ministry of Education to raise standards. As the outbreak of the COVID-19 pandemic has recently propelled a shift towards e-learning, there is an urgent challenge to bridge the gaps between the students, teachers, and online activities. To effectively engage with e-learning, students must become more autonomous and self-directed so that they are ready to interact online (Canter, 2012). In Oman, this evolving format has brought about the need for rapid changes to the practices of both teachers and their students.

Central to the process of designing the online activities are the educational technology affordances that link possible learning opportunities offered by teachers, perceptions and capabilities of learners, and the contextual factors that create an interface between the two agents.

Educational technology can be viewed as the patterns of digital interaction created in education for collaborative, communicative, instrumental cognitive, assessment, and content management purposes (Badia et al., 2011). Indeed, educational technology affordance is an important factor in identifying students' roles, opportunities, and interactions in the emerging fourth and fifth technology revolutions. The learner role has become the centre of the current technological education domain that offers a rich space for interactive learning (Schrader, 2015). Hence, the learners are contextualised within abundant online affordances, or 'opportunities for action', that lead to their learning and growth (Pols, 2012). However, mediating those actions requires scaffolding by a teacher, who indeed helps to create those opportunities by designing educational technology activities and tasks (Amerian & Mehri, 2014). Nonetheless, the actual impact that teachers' perceptions of affordances have on their students' perceptions remains unclear. The interrelation is not clearly identified in the educational technology affordance definition, which primarily focuses on users as agents. Hence, the role of teachers requires further investigation with focus on its impact on educational technology affordances perceived by students in their own learning processes.

In the non-linear classroom interactions that are mediated technologically, learning affordances for e-learning can be seen as cognitive interpretation of an action and a possible interaction to achieve a particular purpose such as learning new skills (McGrenere & Ho, 2000; Pols, 2012). By default, this leads to the status of the 'affordances' of e-learning in education as being oversimplified and having one type or route. This oversimplification of 'affordances' may mean that a collaborative online activity requires the same level and quality of collaboration among students despite the cognitive and social differences and challenges which, in reality, the students face. The question then remains as to

how positively students perceive this technological affordance. Therefore, it is important to shed light on the different affordances brought by teachers and students and the impact of the former on the latter.

Henceforth, this paper aims to compare the affordances of the educational technology perceived by teachers with the actual actions and interactions of students with those affordances. The possible impact of the two agents has to date been underexplored. Moreover, understanding the impact of the affordances created by teachers for students will help to create better online teaching models and enhance the affordances provided by online tasks. The study contributes to this topic by clarifying:

- 1- What possible opportunities do teachers create by using educational technology?
- 2- What are the students' perceptions of the opportunities created by teachers?
- 3- How do students use the opportunities for interactions for learning?
- 4- Is there any impact of affordances created by teachers on opportunities experienced by students for learning?

The paper will explore the concept of affordance in educational technology, related to empirical studies, and students' heutagogical learning in the following section.

## LITERATURE REVIEW

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First, the concept of 'affordance' in relation to educational technology will be explored to see how this has previously been linked to teachers and learners. Second, the extant empirical studies on educational technology will be examined. Conceptual and research gaps will be identified when examining the interrelationship between teachers and learners in creating affordances using educational technology. Third, incorporating the concept of learner heutagogy in e-learning will be explored as a possible avenue for teachers to improve the synergy between teachers creating affordances and learners utilising them.

### *CONCEPTUALISING AFFORDANCES IN EDUCATIONAL TECHNOLOGY*

Although the concept of technology affordances was suggested in 1988 by Norman, technology has evolved immensely since then to include artificial intelligence and the fifth revolution in the 21st century. Encouragingly, this fifth revolution has so far been defined by opportunities to revisit technological innovation from the perspective of how it can best serve humanity, with a focus on purpose and inclusivity (Gauri & Van Eerden, 2019). Certainly, the advice of Gaver (1991), which, although written when much educational technology was inchoate, remains critical: "We must understand the needs and abilities of prospective users. However, equally, we must understand the capabilities and limitations of technologies to know the possibilities that they offer for design" (p. 1). However, specific discussion, drawing attention to the interrelationship between teachers and learners in enhancing affordances, is also required.

Affordances refer to "opportunities for action" (Pols, 2012, p. 113). It is important to understand what these actions are for both teachers and learners. Central to the concept of affordance are three properties: their independence from users' perception of them, their existence relative to users' action capabilities, and their unchanging nature regardless of users' changing needs (McGrenere & Ho, 2000). Hence, in a learning context, the directed/purposeful 'opportunities for learning' for a learner can extend the possibilities of their actions and subsequently lead to learning. However, teachers also influence the learning opportunities when designing and facilitating digital tasks. The influence of teachers can be considered as part of the contextual factors that are explained by McGrenere and Ho (2000) as having a relative influence on the affordances perceived by students. Actions taken are shaped not only by their views (Tsai, 2004) but also by the interfaces in the design (Gaver, 1991).

An important consideration for teachers when mediating learning for their students relates to the types of technology affordances in terms of availability and transferability to the users. Gaver (1991) classified three types: perceptible, false, and hidden. Linking these to the educational context, first, perceptible affordances indicate a straightforward link between technological features and the user's possible interactions or actions. Second, false affordances are non-existent features and undesired actions. Third, hidden affordances are mid-way between the perceptible and the false affordances whereby possibilities do exist, yet the learner remains unaware of them. In this instance, "affordances must be inferred from other evidence, possibly through experimentation and other actions that make affordances visible" (Bucher & Helmond, 2017, p. 7). The role of a mediator, such as a peer or a teacher, providing assistance and guidance, facilitates learning from the sociocultural perspective (Amerian & Mehri, 2014). This mediation provides learners with access to the hidden affordances. In this vein, Murphy et al. (2005) argue that understanding effective interventions which help with educating learners in online learning and collaboration should be prioritised to better access hidden affordances. Badia et al. (2011, p. 23) highlight the notion that "the real and potential possibilities of using technology for educational purposes; the characteristics of the user (teachers and students); and the characteristics of the educational context; all determine the particular educational interactions that really take place between users and technology in a learning activity." Thus, educational technology affordance attempts to draw a roadmap linking the technology to its respective educational contexts.

### ***EMPIRICAL STUDIES***

It has been seen that from a conceptual perspective, consideration of affordances in educational technology has evolved to some extent. However, the progress of educational technology can be described as sporadic and desultory, based on empirical studies. To investigate the integration level of technology in teaching and learning, Turugare and Rudhumbu (2020) surveyed 125 lecturers from three universities in Lesotho, revealing a relatively low level of technology integration in instruction. Though it is not clear how the concept of "technology integration" was perceived by participants in the study by Turugare and Rudhumbu, the status of technology integration echoes pervasive concerns regarding the need for technical support, training, and infrastructure, also shown in Al-Ani's Oman-based study (2013). Likewise, Mao (2014) revealed, based on a sample of high schools, that teachers tended to use technology unsystematically whereas students' educational uses of technology are "incidental and informal." The same study affirms that students utilise social media for non-educational purposes such as socialising and leisure. Mao provided useful parameters for assessing students' technology use for learning, inconsistent attitudes towards and "lack of conceptual understanding of" social media as well as "usability level" in the classroom. Hew et al. (2019) argued that the absence of a clear agenda and theorisation can account for the incidental occurrence of e-learning. The status of technology integration certainly requires further investigation with regards to the use of technology by teachers for creating learning opportunities.

Research into hidden affordances as well as understanding and overcoming the barriers to attaining these remains relevant. It has been argued that technology integration can only be deemed effective if users are able to realise the intended affordances in the learning and the processes of the teachers. Ahad et al. (2018) conducted an interview-only case study on the challenges of technology integration in Bangladesh, revealing that hardware and network connection (i.e., sudden shut down, session timeout, and disconnection) were the main areas of concern. These were reported to have caused delay or disruption and affected quality and productivity. However insightful, the study focused only on faculty and IT personnel. In Oman, a study conducted from the perspective of students on the impact of blended learning approaches in differing online interactions such as collaboration and communication revealed only a moderate impact (Al-Ani, 2013). More promisingly, a study by Tsai (2007) in the context of a Taiwanese high school, revealed that the more effective the role of the internet is perceived to be, the stronger the reported impact on and learning preferences of the learners. For instance, when high-order cognitive thinking skills were involved, the internet was perceived as an important tool. Hence, perception plays a crucial role for incentivising learning. The understanding of

learners can thus enhance the possible perceived and actual interactions. Day and Lloyd (2007) gave less focus to the technological affordance of the internet itself, but a greater focus on how teachers model its use, how meaningful it is to students, and the possibility for interaction with peers. Their action research showed that when these criteria were borne in mind, more successful outcomes were achieved. Although they focused on high school level, some modelling of correct use of sources is still relevant to higher education.

Other teacher actions to support affordances are also discussed in the literature. Lai et al. (2017) were cognizant of the impact that teachers can have on students' use of technology for learning, when they highlighted the principle that focusing on students can reveal cognitive and social behaviours relating to intentions to use technology for learning outside the classroom. Using a survey conducted with 418 participants—both from Hong Kong and the U.S.—their study revealed that the intention to use technology for learning was influenced by two teacher practices: capacity support and behaviour support. Although the study confirms the role of the teacher as a facilitator in a process of scaffolding, it also calls for an examination of the impact of current teaching practices on self-directed learning. Similarly, Yoon et al. (2005) have shown that the engagement of students is highly influenced by the ability of teachers to control online tools, mediate tasks, and provide support. Subsequently, if learning is linked to support provided by teachers, the extent to which learning heutagogy can occur is particularly dependent on the roles that teachers play in facilitating an affordance, thereby shifting our understanding from *hidden* to *perceived*.

### ***TOWARDS A SELF-DRIVEN LEARNING FRAMEWORK***

For teachers to play an effective role in facilitating affordances for their students, a framework to effectively mediate learning in educational technology activities would be highly beneficial. In its incipient stages, the learner heutagogy approach has the potential to develop learner mobility towards self-discovery and self-realisation (Blaschke, 2018). Digital learning practice can increase its meaningfulness when effectively incorporating learning heutagogy (Agonács & Matos, 2019; Blaschke, 2013). Heutagogical learning is self-driven learning wherein learners are controllers of their own learning process (Hase & Kenyon, 2007). Self-driven learners develop competence and capability, where competency is a mental ability and capability is characterised by a learner who is increasingly self-sufficient; a team worker who is creative, flexible, and has positive values (Blaschke, 2012). In many contexts, including Omani higher education, the role of the teacher is likely to be crucial in mediating this process (particularly with learners new to technology) and enabling learners to perceive hidden affordances. The concept of heutagogy is further expanded into e-heutagogy by Canter (2012), which is explained as blending e-learning, pedagogical, andragogical, and heutagogical approaches in order to prepare learners for lifelong learning. As well as developing self-direction and autonomy typical in andragogy, e-heutagogy also strongly emphasises interaction and an interdependence of the learners on each other and, where appropriate, their teacher to effectively manage their learning in an online environment (Canter, 2012).

Kolb (2019) considers heutagogy in e-learning by proposing a “Triple E Framework” aimed to extend learner mobility in digital learning. The model includes three levels: engagement, enhancement, and extension. First, engagement involves interacting with other users during learning. Second, enhancement is achieved by utilising cognitive processes in learning such as creating, evaluating, or synthesising, with the assumption that such mental processes enhance learning. Third, extension is provided by situating learning in the real world. These “three Es” are echoed in Tsai’s (2007) study that investigated the perceptions of ease, relevance, multi-resource, deep knowledge, trigger, and critical thinking.

The possible learning interactions have been classified into four levels according to their demands and complexity by Pols (2012). The system consists of opportunities for the following: first, manipulation; second, effect; third, use; and fourth, action. Opportunity for manipulation posits the lowest cognitive demand in which there is limited interaction with the technology. Learners, accordingly,

may be passive recipients. Effect opportunity refers to the impact or effect of technology on the user, such as feeling of excitement, whereas opportunity for use involves cognitive interaction with technology to achieve a purpose, such as reading to answer quizzes. Opportunities for action represent the highest stage of mental involvement whereby the affordance encourages the learners to take actions requiring cognitive involvement. Any educational activity, such as taking notes or writing critical reflections, happens within a social context. To this end, social presence—a concept first developed by Short et al. (1976), whereby the learner is actively engaged and heavily invested in a learning community—is considered an emblem for effective online learning (Sun & Chen, 2016).

Many of the models and studies conducted in the field of educational technology (e.g. Kolb, 2019; Pols, 2012) have been closely aligned to prominent learning theories: cognitivism, sociocultural approaches, and connectivism. The same can be claimed for learning heutagogy (Hase, 2016). In this model, the essence of the previous models has emerged to position the learner as a constructor of their learning experience through self-directed processes. This is congruent with the cognitive, sociocultural, and connectivist theories. For example, cognitive theory delineates the idea that learning occurs as internal mental processes are aided by simulators (Greeno et al., 1996), while the sociocultural theories are premised on learning collaboratively and collectively within a group (Al-Maawali, 2017), emphasising the importance of teachers and peers. Hence, those theories lean towards empowering the self to learn either cognitively or socially. Learning heutagogy has permeated the current educational systems that call for a paradigm shift towards student-focused instruction, learning collaboratively, and incorporating teacher support when appropriate.

To conclude, educational technology affordance is defined as the provision of self-directed possibilities for interactions that facilitate purposeful self-learning and growth in educational technology models. The focus has been on learners, either at their cognitive or social level. However, it is unclear how teachers attend to these possibilities in the education technology context and how this impacts on the learning affordances of students.

## **METHODOLOGY**

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### ***PARTICIPANTS***

The paper compares the perceptions of teachers and students regarding educational technology tasks and interactions facilitated in classes in Oman Higher Education (HE) public colleges. The study sample comprised teachers who taught at and students who were enrolled in six public HE institutions located across Oman for a two-year foundation program. The course content was English language. The graduates exited the course with a 5.5 IELTS score band. Upon completion, they proceeded to specialisations that are taught in English. The participants were informed of their ethical rights to voluntarily participate, as well as privacy and confidentiality, in an introduction to the surveys (Creswell & Creswell, 2018). Simple random sampling was used for the study to obtain a sample from the teacher and student population who use English language labs, while not targeting any particular individuals. According to Bhattacharjee (2012), although this is the simplest form of non-probability sampling, it is advantageous in its lack of bias and level of generalizability. The number of student participants was 354, the majority of whom had already completed the foundation program. Of those, 237 are female, and 117 are male. They were distributed in the following manner: 156 students attended one class, 110 attended two classes, 32 attended three classes, and 56 attended more than three classes per week in the English labs. As for teacher participants, 102 teachers participated in the survey, of whom 40 are Omani, and 62 are expatriates; 47 are male, and 55 are female. Of the teachers, 72 had taught the program for more than eight years.

### ***INSTRUMENTS***

The two questionnaires represented affordance models according to Pols (2012) and Kolb (2019). Aspects included: manipulation, effect, use, action, engagement, enhancement, and extension (see

Appendices A and B), since these models merit further exploration. The items were organised into a five-point Likert scale, with responses ranging from never (1) to mostly (5). The questionnaires were reviewed by ten teachers who were senior e-learning coordinators and who had been involved in supporting integrated e-learning at the targeted institutions. Items were piloted beforehand and reviewed for clarity of meaning, range of coverage and relevance to the research questions, applicability, and any potential related aspects of educational technology uses. Discussion with reviewers resulted in additional items such as: safety, academic materials, learning style, and efficiency in both questionnaires (items 4, 5, 6, and 7 in the teacher questionnaire and items 2,3 and 8 in the student survey).

Ethical approval was obtained from the English Program Director and the questionnaire items were discussed. The questionnaires were administered electronically to the heads of the departments and e-learning coordinators across the six colleges. The questionnaires were designed using Google forms for ease of dissemination and retrieval. Low responses to the questionnaires were initially received and additional opportunities were provided for both teachers and students to respond.

The questionnaire results were generated into statistics (frequency and graphs) by Google forms and entered into SPSS Amos v20 to generate measures such as mean (to represent the average in responses in each questionnaire item), standard deviation (to assess the spread of answers on each item), and Pearson correlation (to analyse the relationship between perceptions of teacher and student affordances). Given that scale reliability decreases when the Likert point scale is greater than two (Bardo et al., 1982), a standard deviation measurement can increase confidence in the construct validity of items in the questionnaire.

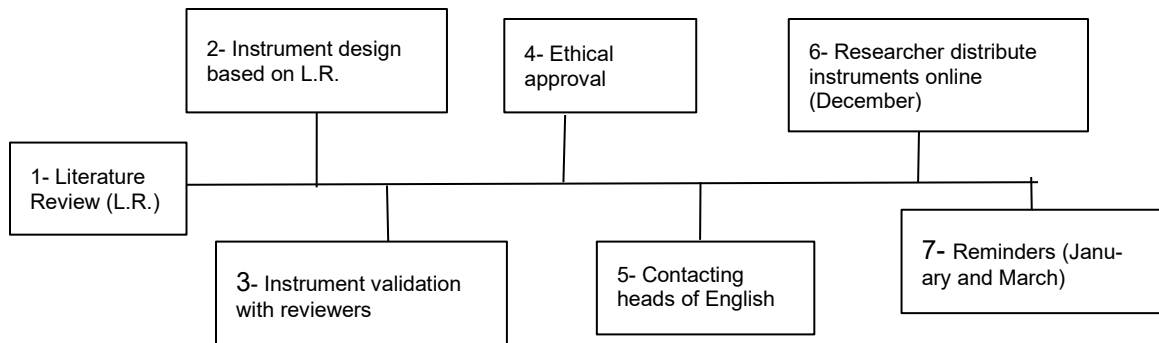


Figure 1. Timeline of the Research Process

## FINDINGS AND DISCUSSION

The findings of the questionnaires are discussed in three themes, namely, the created opportunities, students' self-directed use of online possibilities for learning, and the challenges related to answering the four research questions. Hence, organisation of the items of the questionnaires, see Appendices A and B, may differ because they are organised in this section around themes to show the relationships. The questionnaire results were generated into statistics (frequency and graphs) by Google forms and entered into SPSS Amos v20 to generate measures such as means, standard deviation, and correlation to generate averages and analyse relationships. Both mean and standard deviation yielded results on a Likert scale of 1-5 where 1 indicates (never), 2 (rarely), 3 (sometimes), 4 (mostly), and 5 (always). The correlations were used to test any relationship between teachers' affordances and students' e-heutagogy factors. The open questions were analysed using a thematic text analysis and the meaning of each theme, as described by the respondents, was presented in the analysis section, with the responses expressed as percentages. Standard deviation measurements indicated that data points tended to be close to mean values, thus validating the data.

***TEACHERS' PERCEPTIONS OF ONLINE AFFORDANCES***

The opportunities for learning created by the teachers include the designed online materials in the courses, which indicate the expected possibilities for actions that are to be extended to learners. Hence, it is the intention that those potential activities will have an impact on learning processes. This section shows teachers' perceptions in response to statements relating to types of online affordances, resources and levels of involvement (see Table 1.) Although some of the questions do not relate directly to online affordances per se, they were added for other information-gathering purposes.

**Table 1. Teachers' perceptions of online affordances and practices**

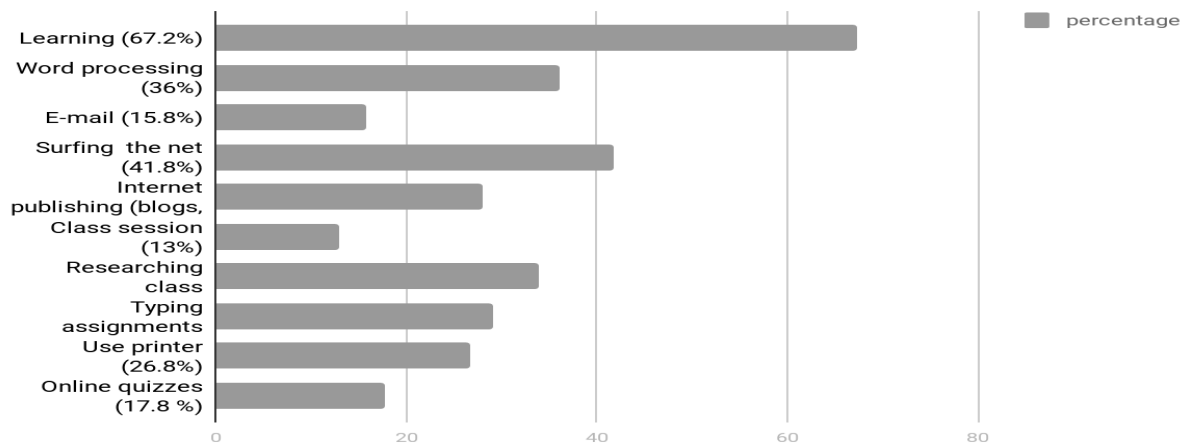
<b>Statement/Descriptive Statistics</b>	<b>Mean</b>	<b>Std. Deviation</b>
1. I use Google Classroom for posting materials, assignments, and educational contents on a weekly basis.	3.39	1.730
2. I use Blackboard for posting materials, assignments, and educational contents on a weekly basis.	2.10	1.288
3. My students have digital literacy skills.	3.00	.941
4. I design educational tasks that are linked to authentic online uses (i.e., use of vocabulary in real online competitions, writing to authentic readers, competing against each other to finish a task).	2.81	1.347
5. I always design activities that require online collaboration.	2.37	1.181
6. I individualise different online teaching activities to fit my students' individual needs.	2.40	1.329
7. I design online educational tasks that require students to learn, or navigate the online space, by themselves.	2.43	1.214
8. My students are aware of cyber security threats through the courses in the FY.	2.29	1.130
9. My students need clear guidance regarding their own and other digital identities and stamps.	3.69	1.174
10. Teaching should be learner-centred.	4.24	.840
11. The pace of the learning process should be controlled by the learner rather than the teacher.	3.47	.966
12. Learning outcomes should aim for the development of personal skills rather than providing a context for peer-to-peer learning.	3.47	1.129
13. Most of the classroom activities should be run in-class rather than through online spaces.	3.04	1.043



Even though teachers tend to agree that they should engage to a considerable degree in student-centred teaching approaches (Table 1, items: 10, 11, and 12), not all teachers perceive that the design of the tasks geared towards student self-learning (Table 1, items: 4, 5, 6, and 7). Agreement with the statement on the use of the official Learning Management System (LMS), that is, Blackboard, on a weekly basis is low, with a mean of 2.10 (item 2), but the use of Google Classroom is at a medium level (mean 3.39; item 1). Regarding teacher perception of students’ ability to engage in the online affordances, items 8 and 9 (Table 1) show that students need more guidance regarding online threats and their online identities; though, students are perceived by their teachers to be digitally literate at a medium mean level (Table 1, item: 3). Finally, there is a medium mean level for in-class teaching over online teaching (Table 1, item: 13).

***STUDENTS’ PERCEPTIONS OF ONLINE AFFORDANCES***

Figure 2 shows the students’ perceptions on what the language laboratories or ‘labs’ are used for. It is useful to understand how students perceive the purposes of the learning context. The students’ use of the educational computer labs is reported to be mostly for functional purposes—either for course-related or personal uses. Learning is reported as the primary reason for attending those labs at approximately 67%, of which 37% of users indicated that labs were their course classes. In the case of course-related uses, completing assignments and quizzes were mentioned. Personal reasons largely included emailing (at approximately 42%), publishing, and surfing the internet. A study of electronic uses over five years (2005–2009) by Judd and Kennedy (2010) revealed that although email was a primary communication tool, its use decreased over time. These characteristics cluster around the “manipulation” level of affordance (Pols, 2012). This illustrates that the manner in which teachers conceptualise educational technology ‘possibilities for learning interaction’ affects students’ self-directed use of their possibilities of learning.



**Figure 2. Student’s purposes for using computer labs**

Table 2 examines the extent to which students perceive possible features in their online context to be an affordance they access. On a scale of 1-5, 1 indicates that the affordance is perceived as unavailable, while 5 indicates that the affordance is perceived to be readily available. Regarding possibilities for extending use of online resources into course-related activities (see Table 2), students’ perceptions of learning opportunities were at medium level of availability with a mean of 3.55 (item 1). Students reported a comparatively limited level of teacher support for critical involvement with online content, with a mean of 3.44 (item 2). Similarly, there is perceived to be a medium level of authentic social extension of the online tasks (item 3). Relatively limited levels of reflective practices triggered by the educational technology activities are reported (item 4). Regarding question 2, “My teacher helps me criticise online content,” the survey sought to elicit whether teacher interventions online

helped them in critical engagement with online content. Although piloting suggested this statement was understood as intended, it may have been a better way to phrase the statement as per this additional description.

Indeed, this is congruent with the first level of affordance, “manipulation”, (Pols, 2012) wherein little cognitive involvement in the online interaction is reported. However, care must be taken as ease and availability of the online resources is negatively linked to the reported misuses of online resources, such as plagiarism, in Oman (Naqvi, 2013).

**Table 2. Students’ perceptions of online affordances**

Statements/Descriptive statistics	Mean	Std. Deviation
1- Use of online resources on projects.	3.55	1.192
2- My teacher helps me criticise online content.	3.44	1.192
3- Online tasks extend to real life.	3.10	1.094
4- The online activities help me to think and reflect.	3.31	1.055

To conclude, it seems that students perceive moderate opportunities for learning based on the opportunities created by teachers. Hence, the correlation between the opportunities created by the teachers and the learning activities engaged in by the students shows that teachers tend to have an influence on students to some extent, as claimed by McGrenere and Ho (2000).

***STUDENTS SELF-DIRECTED USE OF ONLINE POSSIBILITIES FOR E-LEARNING***

The self-directed use of the online possibilities for learning is explored by three subcategories: online literacy (safety, academic materials), extending learning (collaboration on projects, open forum discussions), and self-knowledge (learning style, and efficiency) (Table 4). The statistical analysis shows significant correlation between two factors: teacher affordances for e-learning and students’ heutagogy at about .01 (99%; see Table 3).

**Table 3. Correlations between e-heutagogy and teacher online affordances**

		Heutagogy	Teachers affordances
Heutagogy	Pearson Correlation Sig. (2-tailed)	1	.759**
Teachers’ affordances	Pearson Correlation Sig. (2-tailed)	.759**	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Table 4. Learner heutagogy for online affordances**

Statements	Mean	Std. Deviation
1- I can distinguish academic from non-academic resources.	3.31	1.035
2- I can learn by myself online effectively.	3.35	1.005
3- I collaborate on projects.	3.32	1.101
4- I can select materials suitable to my learning style.	3.26	1.059
5- I participate in online forums.	3.04	1.040
6- I can distinguish safe sites.	3.39	1.186

Table 4 shows that many students neither agree nor disagree with all six statements on their abilities or activities online, where a mean of 1 is never and 5 is always applicable. This may suggest that more support is required so that students can access these affordances and fully understand the benefits of e-heutagogy (Blaschke, 2012; Canter, 2012). It is not surprising that students are neutral on items 2 and 5 which relate to online project collaboration and forum participation, respectively. This may be a result of affordances as perceived by teachers in Table 1 item 5, “I always design activities that require online collaboration”, which many teachers disagreed with (mean 2.37). Although it is not necessary to *always* design activities for online collaboration, this alongside results from the students’ questionnaire may suggest a lack of affordances for students. So and Brush (2008) attributed a relationship between satisfaction and perception of collaborative learning. This evidence supports the view that further emphasis on collaborative learning for teaching and learning in the context of higher education in Oman would be beneficial.

Additionally, active participation in forums and discussions is equal to e-collaboration on classroom related projects. In Yang and Lin (2010), active participation in Moodle forums was associated with high positive attitudes towards using them, while self-efficacy was not linked to active participation. Likewise, Eskandari and Soleimani (2016), although finding no statistically significant impact of online collaboration on learning conditional sentences, reported that the experimental group surpassed the control group, which was linked to high motivation. It is argued that perception of the possible means of active participation affects students, potentially increasing their motivation and levels of collaboration.

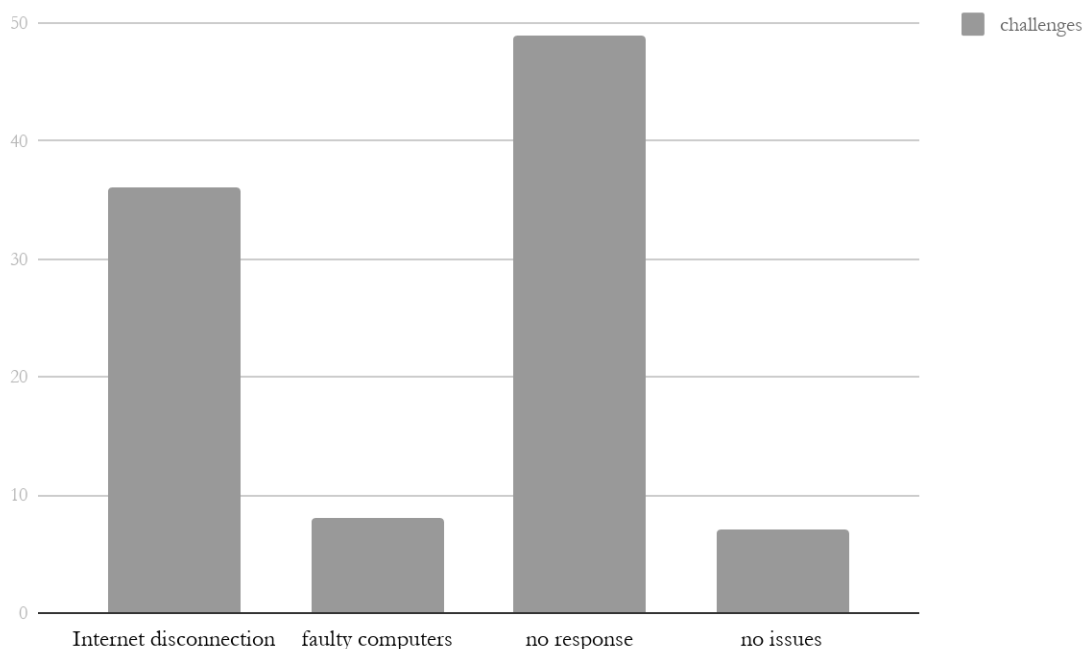
The reported ability of students to distinguish academic online resources from non-academic ones is medium. Judd and Kennedy (2010) confirmed in a five-year study (2005–2009) that the primary websites used on the internet for academic projects were Google and Wikipedia, while use of alternative academic resources such as libraries and specialised portals remained low throughout the five years. Although more studies are needed in this area, this indicates the negative influence of an excessively limited awareness of the range of internet resources. There is also a perceived medium awareness regarding distinguishing safety of sites. The question remains as to whether this self-report of student perceptions is reliable. This finding also differs from Mohammed and Cavus (2016), in which students demonstrated low awareness of web security and unsafe malicious software.

In this study, the students’ perceptions of the effectiveness of their own online learning is medium, with a mean of 3.35 (item 2). Similarly, students’ perception of matching materials with learning style

is relatively medium with a mean of 3.26 (item 4). The degree of perception required to match mediated learning to learning style is indeed a high level of self-reflection, that requires self-awareness, and is crucial to learning in heutagogy. This would suggest that targeted interventions are required for teachers and their students to maximize the benefits of e-heutagogy in the setting.

**CHALLENGES**

In the questionnaire for students, the participants were asked an open question regarding possible issues pertaining to online teaching. Two main challenges regarding to educational technology infrastructure were raised, namely, repetitive internet disconnection at 36% and faulty computers at 8% (Figure 3). One student commented: “I hope something can be done to remedy the obvious issues.” This was verified by others who said: “we do not have internet” and “change the computers.” It is difficult to interpret the results of these questions, as about 49% did not answer the question, while 7% reported no requirement to change the infrastructure and services. Al-Ani (2013) found similar issues of “frequent disturbance in computers” as a challenge to blended learning.



**Figure 3. Students’ perceptions of online challenges**

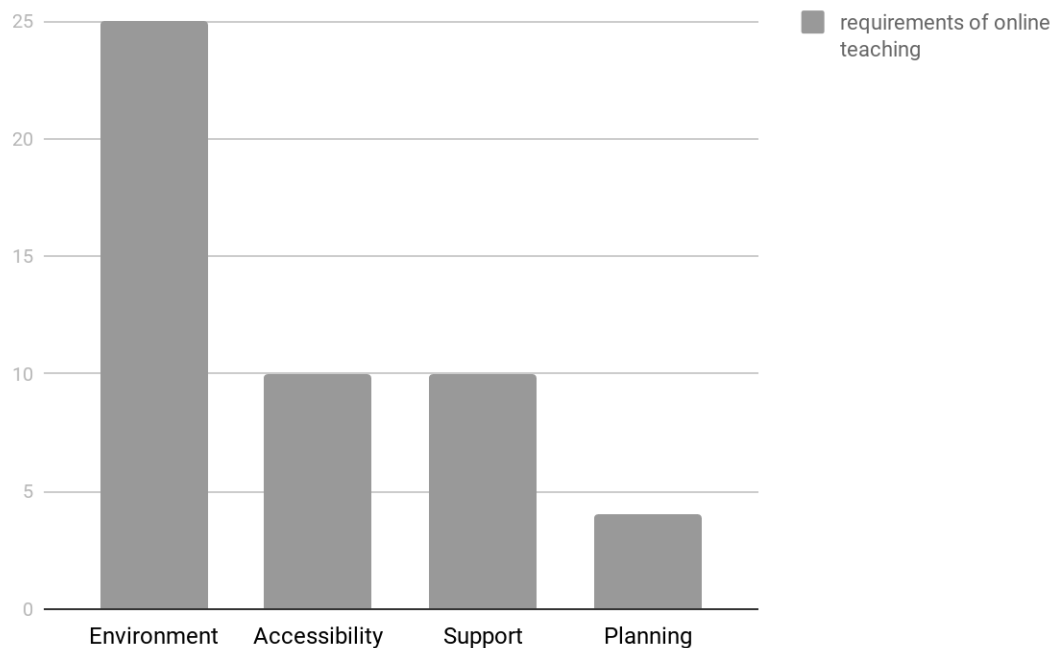
Regarding extending the level of the affordance to heutagogy, the analysis of the open question on the students’ questionnaire reveals little indication that students are able to recognise possibilities for self-directed learning. Only four students (about 1%) mentioned the need to “adapt class activities to their abilities to learn and have fun,” “smart use of technology,” “add applications for learning,” and “add programs to support difficult subjects.” To conclude, it is unsurprising to note little student concern about high-order levels of affordances, considering what is revealed in the above sub-sections.

**Table 5. I like online teaching (Students’ Questionnaire)**

Item/Statistical test	Mean	Std. Deviation
I like online teaching	2.69	1.225

Finally, the students demonstrated a moderately medium favourable opinion regarding the current practices of online teaching with a mean score of 2.69 (Table 5). This indicates that the students are largely satisfied with their online education system. This shows that raising awareness of students towards different levels of affordances is required. Hence this, indeed, has repercussions for the clarity of the affordances or the ability for students to personally engage with their own learning practices.

The perceived essentials for designing an online space for the Omani HE context have been elicited from teachers in an open question leading to four main components: characteristics of the online environment (n= 25 or 24.5%), accessibility (n=10 or 10%), support (n=10 or 10%), and adequate planning (n=4 or 4%) (see Figure 4). This question was answered by only 50% of the teacher participants. As for the characteristics of the online environment, it is described as “interactive,” “engaging,” “user-friendly,” and “disciplined.” As for accessibility, difficulties were explained by the participants in terms of existing systematic WIFI access both at the college and hostels, which concurs with students’ complaints about internet connectivity, shown in Figure 2. As for support, teachers reported a need for infrastructure support, training for teachers and students, supportive policies, timely maintenance, and continuous professional development. Finally, planning is explained in the following comments: “learning is built on, shared, and gauged accordingly,” “thoughtful planning,” and “technology as a permanent component in the learning process.”



**Figure 3. Teachers' perceptions of requirements for online learning**

Overall, the students' responses show that their teachers created opportunities for learning that were rated as average. This corresponds to their teachers' responses, which reported a medium level for designing the tasks to facilitate student self-learning. Furthermore, the statistical analysis shows significant correlation between two factors: teaching affordances for self-directed learning and students' tendency towards heutagogy in online space. Moreover, there is a slight difference between students' and teachers' perceived challenges for online teaching and learning. On the one hand, the students held a moderately favourable opinion regarding the online teaching they received; however, more challenges regarding connectivity and faulty computers were reported on than regards the approach to teaching. On the other hand, teachers held varied opinions regarding online teaching with a prominent focus on the need to design a learner-friendly environment that is interactive and engaging.

## **PEDAGOGICAL IMPLICATIONS: ENHANCING E-HEUTAGOGY AFFORDANCES**

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The heutagogical approach to learning encourages learners to be self-sufficient and self-directed (Blaschke, 2012; Hase & Kenyon, 2007). Learners are exposed to a range of content, interactions, communities, ideologies, and choices (McLoughlin & Lee, 2007), yet they need to be educated about their online interactions and resources (Murphy et al., 2005), with particular reference to online learning. Within the parameters of e-heutagogy, the study suggests an array of recommendations for e-learning in the classroom and for conceptualising e-heutagogy in a way that understands the roles of teachers and of students that focus on the interrelation between teachers and students, providing opportunities for learning. The present study implies that surveyed teachers already show considerable understanding of what e-heutagogy requires in practice. However, significant challenges exist in terms of implementing practical steps, as mentioned by Kenyon & Hase (2010) such as revamping the curriculum and fostering new roles for more active students, with teacher roles adjusted in response to this change.

The teacher is a focal agent in creating the e-learning affordances that students engage in during their English language learning. This study reveals that the current online practices of teachers can be described as primarily using the internet as a medium for communicating materials with limited planning for cognitive and social challenges in which students can engage. An example of such a challenge might be forums that can support self-directedness in online learning, particularly in the current context of Oman. Omani school graduates have been characterised as underperforming and requiring a bridging year (Al-Mahrooqi et al., 2016). In this regard, there are three recommendations pertinent to teachers. First, awareness and conscious raising of teachers' self-practice can be supportive for the learning heutagogy of students. Second, focalisation on e-learning affordances in the current discussions about e-learning movements. A third suggestion calls for further education of teachers who have not necessarily received specialised training in the e-learning field.

With regards to the role of students in e-heutagogy, it can be seen that they are influenced by the opportunities for learning processes that are designed by teachers. Thus, suitable learning experiences should be furnished so that students are empowered to grasp their own learning, focusing on cognitive and social engagement, according to the learning affordances outlined by Kolb (2019) and Pols (2012). The competence of teachers in providing e-affordances and students e-heutagogy are correlated. Therefore, it is possible that once teachers can engage students in more collaborative and critical social activities, self-efficiency and directed learning can be enhanced. As Hase (2016) explains, the foundation of heutagogy is that learners' agency for learning is cumulative and that learners should be encouraged to take up more active roles that include becoming "partners" in the learning cycle (Hase, 2016).

Based on the strong correlation between e-heutagogy and online affordances, a bridging of the two concepts is proposed. The notion of online affordances creates a context for self-determined learning. Hase (2016) summarises this as follows:

While heutagogy suggests that the ability to learn is a natural human condition, there is still a need to learn process skills such as the use of technology, doing good research, differentiating the wheat from the chaff, working in teams, continuous improvement, problem solving and critical thinking. So, these skills are central to a self-determined learning educational environment, underpinned as they are by the notion of human agency. Learning how to learn is a critical life skill and is central to the principles of self-determined learning. (p. 5)

Similarly, the concept of online affordances potentially provides opportunities for collaborative learning, critical thinking, social extendibility, and mental involvement in activities (Kolb, 2019). However, rarely do discussions in the literature focus on the connections between these concepts. The concept of affordances for e-heutagogy is proposed as a means of extending theories of e-learning. From the

teacher perspective, the tripartite notion of IT tool, teacher support, and learning task need to be the focus of ongoing teacher education and development. In this way, teachers can play a stronger role in continuously enriching affordances and encouraging more active use of them in e-heutagogy for students. It would be useful to join together the common issues identified by both teachers' and students' perceptions elicited in Oman. For instance, a collaborative online activity (raised by teachers), which is meaningful to real life (perceived as less used by students) such as a group problem-solving task involving critical thinking could be co-developed and piloted by teachers as part of e-heutagogy approaches. Such approaches would allow for the development of a balance between flexibility as well as structure to incorporate student needs and preferences, which was highlighted as of the utmost importance in Day & Lloyd's (2007) study.

## CONCLUSION

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To conclude, this paper examines the possible impact of the opportunities created by teachers on the engagement with purposeful learning opportunities by students. A comparison of the perceptions of teachers about the impact of any e-heutagogy with the awareness of students about their own e-learning revealed a strong correlation. This study contributes two aspects to the understanding of the concept of the educational technology affordance. First, it is collective, that is, both teachers and students perceive similar opportunities for learning. It was shown that the e-heutagogy learning practices were restricted in range due to limitations inherent in the opportunities created by teachers. Second, it was found that teachers created a low level of online engagement. This calls for education of teachers to raise the awareness about the affordances of educational technology.

The limitations of this study are in its methodological orientation that focused on the perceptions of teachers and students about the online learning opportunities experienced. Hence, utilising an exploratory study would better reveal the actual affordances for e-heutagogy that teachers create and the actual e-heutagogical actions that students engage in. Therefore, more studies are needed to enlighten us on the affordances that can be created for e-heutagogy learning. Moreover, this study reveals the need for higher-order affordances that are directed towards engaging cognitive and social abilities and capabilities of the learners. More studies on the impact of the different levels of affordances on students learning and heutagogy are also needed.

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## APPENDIX A

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### Teachers' Survey

Technology Integration in ELT and Foundation Programs at CAS Network

Dear instructor,

This questionnaire is part of a study to investigate the current trends employing technology in teaching and learning in the Foundation Program Year (FPY) and ELT Program at the Colleges of Applied Sciences (CAS). Your input is highly appreciated and will enlighten the design of a framework for integrating technology at CAS. All your input will be dealt with confidentially and anonymity will be ensured. Your participation is voluntary.

Thank you!

#### Section 1 Biographical Data

College (institution) name:.....

You are:

- male
- female
- Omani
- expatriate

You have an experience of teaching English at ELL:

- 0-2 year
- 2-4 year
- 4-8 year
- more than 8 years

Your qualification is.....

You taught foundation year for

- none
- 1-3 semesters
- 4-8 semester
- other.....

## Section 2 Current Practices of Blended Teaching

This part investigates the current practices of integrating technology in teaching regarding three main areas: engagement, enhancement, and extension. Rate the following statements: 1 (never), 2 (rarely), 3 (sometimes), 4 (mostly), 5 (always)

statement	1	2	3	4	5
1. I use Google Classroom for posting materials, assignments, and educational contents on a weekly basis.					
2. I use Blackboard for posting materials, assignments, and educational content on a weekly basis.					
3. I design online tasks and projects that require students to: 3.1 use online references to complete 3.2 apply critical thinking skills 3.3 distinguish between authentic and non-authentic references 3.4 collaborate with native speakers 3.5 contact learners outside classroom boundary 3.6 use higher order thinking skills 3.7 be involved in online discussions 3.7 practice English outside the classroom					
4. My students have digital literacy skills.					
5. I design educational tasks that are linked to online authentic uses (e.g. use of vocabulary in real online competitions, writing to authentic readers, competing against each other to finish a task).					
6. I always design online activities that require online collaboration.					
7. I individualise different online teaching activities to fit my students' individual needs.					
8. I design online educational tasks that require students to navigate the online space by themselves.					
9. My students are aware of cyber security threats through the courses in the FYP.					
10. Students need clear guidance regarding their own and other digital identities and stamps.					

Section 3 A framework for Online Space

Rate the following statements: 1 (never), 2 (rarely), 3 (sometimes), 4 (mostly), 5 (always)

11. Teaching should be learner centred.
12. The role of the teacher should be mainly as facilitator and observer.
13. The pace of the learning process should be controlled by the learner rather than the teacher.
14. Learning outcomes should aim for personal development of skills rather than providing contexts for peer-to-peer learning.
15. Most of the classroom activities should be run in class rather than through online spaces.

Section 4: Please answer the following question (optional)

For optimal blended classroom, the online environment should be (you can write about any problem, challenge, or opportunity for improvement)

.....  
.....  
.....

## APPENDIX B

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### Students' Survey

Technology Integration in Foundation Program CAS network

Dear student,

This questionnaire is part of a study to investigate the current technology use in teaching and learning in the Foundation Program and ELT courses at the Colleges of Applied Sciences (CAS) and Rustaq College of Education (RCoE). Your privacy and anonymity are assured. Your participation is voluntary. Thank you.

#### Section 1 Biographical Data

You study at .....college/ institution

Your current level of study is .....

You are

- male
- female

You study in the labs ..... class(es) per week.

- one
- two
- three
- four or more

Section 2 Possibilities for online learning

1. What is the major reason for you using the computer lab? Check all that apply.

- Learning
- Word processing
- E-mail
- Surfing the net
- Internet publishing
- Class session
- Researching class assignments
- Typing class assignments
- Using printer
- Online quizzes
- Other.....

Section 3 Affordances of online learning

Learners interact with technology in their process of learning. Rate the following statements: 1 (never), 2 (rarely), 3 (sometimes), 4 (mostly), 5 (always)

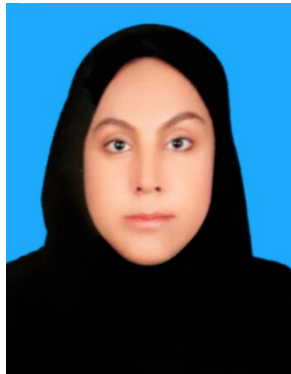
Statement	1	2	3	4	5
1. I use online information to complete tasks and projects.					
2. I am able to distinguish between academic and non-academic resources.					
3. I am aware of the unsafe use of online resources.					
4. The teacher helps me when I survey the internet in criticising the content.					
5. The course includes online real-life application or uses (e.g. use of vocabulary in real online competitions, use of vocabulary when writing a letter to a real person).					
6. My learning -through use of online resources- is as beneficial as other courses that do not use online learning.					
7. I have always used online tools for working with my friends on projects.					

Statement	1	2	3	4	5
8. I use online learning materials that are suitable to my learning style (e.g. I listen to audio because I am good at listening).					
9. The online use (for courses) encourages me to reflect on and think about learning materials.					
10. I participate actively in educational forums that require involvement in discussions, giving feedback, or evaluating.					
11. I enjoy online teaching.					

Section 3: Please write your feedback (on any issues, challenges, or requests) with regard to using technology in teaching (optional)

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## BIOGRAPHY



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