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An examination of undergraduate students' engagement in an information literacy blended course

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Abstract

To develop information literacy (IL) skills of Arab students enrolled in a first year premedical programme of an American branch campus in Qatar, the Education and Research Librarian designed a blended IL curriculum that was integrated in the English for Academic Purposes course. The IL curriculum used the flipped classroom modality that combined e-learning materials with face-to-face sessions taking place every other week. The e-learning materials consisted of biweekly online modules and practice quizzes that students needed to review and submit prior to the face-to-face sessions designed to engage students in class discussions and hands-on activities. While a few students showed a modest level of engagement during the face-to-face sessions, the majority did not seem to be fully engaged or aware of the content in the online modules. To find out why, this study sought to research the reasons for this disengagement by investigating students' perceptions of their engagement. A case study methodology consisting of a survey and three in-depth interviews with a purposive sample of students was used to collect data. The study concludes that students' perceptions of a blended IL curriculum are impacted by the importance they attribute to the topics covered in IL. Results also suggest students' preference for just-in-time, online, and asynchronous access to content with an optional face-to-face attendance that would help them learn about a skill when they need to use it.

1. Introduction

In the fall of 2013, the Education and Research librarian had the opportunity to design and integrate an information literacy (IL) curriculum in the English for Academic Purposes (EAP) course for premedical students. The course was part of the premedical curriculum of a branch campus of an American medical college in Qatar. Six years later, the IL curriculum has now become an integral component of the EAP course.

Advocating for the integration of IL in college curricula, the Association of College and Research Libraries (ACRL) developed core competencies that empower librarians "within their own knowledge domain" to develop an IL curriculum that aims to:

"connect information literacy with student success initiatives; to collaborate on pedagogical research and involve students themselves in that research; and to create wider conversations about student learning, the scholarship of teaching and learning, and the assessment of learning on local campuses and beyond" (www.ala.org/acrl/standards/ilframework).

Based on this framework, the current IL curriculum was designed to develop premedical students' basic research skills, strengthen their critical thinking abilities, and prepare them for lifelong learning. Students join the medical college from local schools that teach mainly in the Arabic language with barely any attention given to research and IL skills. Therefore, the IL curriculum was aligned to complement the EAP course and create a context for students to implement the new skills they acquired in IL.

IL uses a Blended Learning (BL) approach with a flipped classroom modality that combines e-learning materials with face-to-face instruction and integrates in-class activities that take place every other week. One week prior to each class session, an online module that aims to achieve two to three learning outcomes is made available to students. They are prompted to view the content, access online materials and submit a practice, ungraded quiz before the next class session. Face-to-face sessions start with a graded quiz that checks students' understanding of the module content, followed by group activities and class discussions.

Based on class observations, a few students showed a high level of engagement during face-to-face sessions through discussions and group activities. Students would usually express their opinions, ask questions, and volunteer

to answer questions. However, the majority of the students did not seem to be engaged in class or aware of the content covered in the online modules. Consequently, the same information was repeated in class over and over again, which called for this study to investigate the reasons for this disengagement. Therefore, this study aims to contribute to the knowledge base of college students' readiness by exploring a relatively under-researched area: students' engagement in an information literacy blended course. The results of this study hope to generally inform teachers, librarians, and administrative staff of other Transnational Higher Education (TNE) institutions of the challenges and opportunities of designing an integrated blended IL curriculum for first year non-English speaking students. The study would also be considered as the first one to address this topic in an Arab Gulf country with native-Arabic speaking students enrolled in a foreign American premedical programme.

2. Information Literacy in Medical Education, Blended Learning, and Student Engagement

This section will review literature on three main areas relevant to the topic under investigation. The first section will be used to critically analyse the available literature on developing IL for medical students. Section two will investigate the uses of BL for IL development. Section three will gather and critically appraise the available literature on student engagement in blended learning (BL) courses. Another potential area for discussion is the availability and accessibility to technology as an important aspect of this debate. However, this will not be covered in this study for two reasons. First, the limited nature and scope of this paper does not allow to delve into this topic. Secondly, due to the situated context of this study, the lack of technological infrastructure is not the issue since Qatar is considered among the top countries with 91.5% of individual internet usage and 98% of households with Internet access (www.motc.gov.qa, 2014).

2.1 Developing IL for Medical Students

2.1.1 IL Skills for Medical Students

IL skills have been deemed important for medical students for the last twenty years. When medical schools started adopting problem-based learning (PBL) - a learning approach developed in the 1960s by McMaster University Medical School (Blake, 1994), this pedagogical approach necessitated a new set of skills, the IL skills, and considered

them essential for students' critical thinking and lifelong learning abilities. A few years later, IL was considered among the five goals of the U.S. Department of Education's 'National Education Technology Plan' (Virkus, 2003). While the beginning of this integration was cautious and timid, it did not stop librarians from stepping in to collaborate with faculty in providing basic library orientations and research skills (Carder et al., 2001). This collaboration proved to be critical later on with the ubiquity of technology and abundance of information in order to teach students critical skills in finding and evaluating relevant content (Bendriess et al., 2015). Nevertheless, more research on IL integration in premedical curricula is needed.

2.1.2 Integrating IL in the Curriculum

Several studies explored the integration of information literacy skills in medical curricula. For instance, a study by Haraldstad (2002) described the effort to develop an IL curriculum for medical students in their first and fifth years that focused mainly on evaluating information sources. The author identified the important role of starting the integration of IL early on in the medical programme and building on students' knowledge to cover all the skills they need by the time they graduate. The study also argued the necessity to test students' IL skills like any other clinical skills they need to master (Haraldstad, 2002). The results of this study still hold true in today's medical education. This is reinforced by another recent study that shows that the earlier an IL intervention occurs, the more impact it can have on students' ability to locate and access online resources, evaluate the information found, and use evidence-based resources (Kingsley et al., 2011). However, these studies did not uncover the challenges encountered by non-native speakers of English who have probably never heard of IL. Therefore, more information is needed to explicate situated IL practice with Arabic-speaking medical students of a TNE institution.

2.2 The Uses of BL for IL

2.2.1 BL for Enhanced IL Skills

The Macmillan dictionary defines BL as "a method of learning which uses a combination of different resources, especially a mixture of classroom sessions and online learning materials" (www.macmillandictionary.com). The BL approach was sought as a solution to the growing need of IL skills, budget constraints, and the urgency to reach out to students and faculty in a more direct, visible, innovative, and engaging way (Pankin et al., 2012). A recent study investigating students' self-directed learning and communication

skills confirmed that using a BL approach in an IL course improves students' self-directed learning (Sriarunasmee et al., 2015), one of the most important life-long learning skills that students need to develop as future global citizens. On the other hand, a study by Kong (2014) that investigated the design and implementation of a digital classroom to develop students' IL skills and critical thinking abilities showed "statistically significant growth in domain knowledge, in the cognitive and meta-cognitive perspectives of IL competency, and in all the five major perspectives of critical thinking skills" (p. 172). Clearly, blended learning plays a vital role in IL pedagogy.

2.2.2 Increasing Engagement Through Face-to-Face Encounters

While students prefer more online courses and fewer face-to-face sessions, allowing them more flexibility and asynchronous access to course materials, they also "lament having no face-to-face experience" (Dziuban et al., 2011), which calls for BL as a balanced approach to maintain their student-student and student-faculty interactions (Moskal et al., 2013). This human interaction remains essential to effective teaching and learning, especially with careful consideration of cultural milieu and learner dispositions, which these studies failed to explicate. A successful BL experience consists of a 'face-to-face learning' component where teachers and students meet in a traditional classroom setting; a 'self-paced e-learning' component where students have asynchronous access to learning materials through technology; and a 'live e-learning' component where teachers and students connect in real-time using technology (Van Dam, 2001, as cited in Sriarunasmee et al., 2015). However, the results also suggested implementing more class time to increase students' interaction and encourage discussions (Kong, 2014). This has been undoubtedly conducive to effective learning in the current class under investigation as students attempt to make sense of the online content through hands-on activities and peer discussions.

2.2.3 The Blended Librarian

When discussing BL and IL, it is also important to define the role of the 'blended librarian' who, according to Sinclair (2009), "is versed in both print and online tools and can help faculty meet course goals, regardless of the medium or technology" (p. 504). Therefore, the role of a blended librarian is to design, implement, promote, and assess educational opportunities that keep up with the "radical paradigm shifts occurring in society driven by the evolution of information technologies" (Shank & Bell, 2011, p. 105).

2.3 Student Engagement in Blended Courses

2.3.1 e-Learning and Students' Self-Reflection

The ubiquity of technology in education has bolstered the combination of face-to-face and e-learning environments and provided students with additional engagement opportunities (Delialioglu, 2012). Many studies have argued the positive role of technology in leveraging student engagement. For example, Robinson and Hullinger (2008) encouraged the use of technology for asynchronous learning to allow more time for students to reflect on their learning and apply the new knowledge they acquire. Furthermore, Duderstadt et al. (2002) suggested the use of e-learning to improve higher order skills, such as critical thinking, collaboration, and problem solving.

2.3.2 e-Learning and Student Engagement

When designing e-learning content, effective modules include online collaborative activities (e.g., discussion boards) linked to learning outcomes from another course (transferable into other current courses) and contain assessment activities that evaluate students' learning and provide them with an opportunity for reflection (Barker et al., 2007). However, in the absence of an online moderator to encourage and facilitate online collaboration, students who are not self-directed learners will not benefit from e-learning. In fact, they might even feel marginalized and disconnected, a concern left unaddressed in these studies.

2.3.3 It Takes More to Engage Students

Other studies underestimated the role of technology by stating that the success of BL should not be attributed to the use of technology (Means et al., 2009; Clark, 2009) but to the "alignment of institutional, faculty, and student goals" (Moskal et al., 2013). Alignment of these components is no doubt critical as it reflects sound course design in general. Yet, from a practitioner point of view, technology should be readily available when needed by teachers and students alike. It should also be considered as a tool rather than an end in itself and should be carefully tailored to serve the institutional mission, support curriculum, and foster student learning.

2.3.4 e-Learning and Reusable Learning Objects

In a recent case study exploring undergraduate and postgraduate students' attitudes towards e-learning and BL, the survey results favoured the BL approach (McGuinness &

Fulton, 2019) and encouraged the use of e-learning tutorials as "reusable learning objects, which can be accessed as just-in-time delivery modes, when students perceive they need to review particular skills or reinforce learning material" (p. 2). Yet, these reusable learning objects can be enhanced and made more relevant by adding a variety of learning materials that would support students' learning styles and by providing examples that relate to students' cultural context, experience, education, and interests.

2.4 The Gap in the Literature

The challenge that we usually face with the constant access and use of technology is getting students engaged both in the digital and face-to-face environments. Based on the review of the literature, this study aims at investigating students' perceptions of the IL blended curriculum and understanding their attitudes towards the usefulness and application of IL skills. In the local context where this study took place, many schools still follow a teacher-centred approach where teachers are considered knowledge experts while students are passive learners, especially in some Gulf countries.

This perception of teaching and learning has therefore caused some difficulties for students transitioning into higher education where self-directed and independent learning is expected (Frambach et al., 2012). Based on this context — a TNE institution — and the background of the participants — first year Arab students enrolled in a premedical course of a branch campus of an American medical college in Qatar — student engagement should be explored to identify its core aspects and interpretations, especially in BL. Therefore, this study is an opportunity to fill a gap in scholarship on engagement in BL by Arab premedical learners in a TNE medical college in Qatar.

3. Theoretical framework

Although student engagement is considered a cornerstone in students' success and achievement, reaching consensus on a clear definition of engagement remains a challenge. Initially, student engagement started with Astin's (1984) theory of student involvement, which "refers to the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). Some studies argue that student engagement should be measured by collecting students' perceptions of and interest in their learning activities, such as their interaction during class time and their interest in knowing more about a topic (Chapman, 2003). Other studies revealed that engagement

is manifested through students' use of cognitive and metacognitive skills to self-regulate their learning (Pintrich & De Groot, 1990; Pintrich & Schrauben, 1992). This study uses the following student engagement three-dimensional framework (Fredricks et al., 2004; Trowler, 2010; Balwant, 2018): *behavioural engagement* concerned with students' behaviour vis-a-vis completing the required work; *emotional engagement* which considers students' self-report on their feelings, interest, and values; and *cognitive engagement* which can be measured through students' motivation, their active problem-solving skills and organisation skills. For each dimension, each student can manifest a positive engagement, non-engagement, or negative engagement (Trowler, 2010).

3.1 Research Questions

Overarching RQ: What are the key differences and similarities between Arab premedical student engagement in the face-to-face component versus the online component of a blended information literacy (IL) curriculum offered at a branch campus of an American medical college in Qatar?

- RQ1: What are the perceptions of premedical students about their engagement in the biweekly IL face-to-face sessions?
- RQ2: What are the perceptions of premedical students about their engagement in the online component of the IL curriculum?

4. Methodology

The targeted population for this study is a purposive sample of a class of 17 premedical Arab students who were enrolled in the IL course for the academic year 2018-2019. This sample was chosen for its "fitness for purpose" (Cohen et al., 2018, p. 386) since these students have experienced the IL blended curriculum recently, which might provide some fresh insight and feedback to help inform this study.

Being aware of the challenges this study might produce and students' level of comfort or, rather discomfort, when providing feedback, and in order to mitigate any inconvenience, the study was postponed until the end of the academic year, after final grade submission, to reach out to the students and get their feedback. Students were also reassured that the survey was completely anonymous and the study would have no impact on their performance.

The small number of participants, the focused topic under investigation, and the context in which this study took place necessitated a case study approach. A case study

methodology is used "to portray, analyse and interpret" (Cohen et al., 2018, p. 188) a phenomenon that is taking place within a defined group of first year, premedical students. It is guided by the need to investigate how and why a particular issue has occurred (Anderson, 1993), describe the uniqueness of the problem, and provide a deep understanding of the reasons (Patton, 1987) behind students' disengagement in a blended IL curriculum. Although it has been criticized for being unable to generalize findings (Johnson, 1994), a case study methodology will be used as a research methodology to investigate a 'phenomenon' (student engagement in a blended online course) 'in depth and within its real-life context' given that the "boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18).

5. Methods

Two methods were used to collect empirical data: a survey with closed and open-style questions and three in-depth interviews with three students. Qualtrics was used to create the survey and share it with all students. Students were made aware of the purpose of this study by sharing the study information sheet and consent form approved by the course convenor prior to starting the data collection. The first page of the survey explained the purpose of the study and asked students for their consent to participate, followed by nine questions. Then based on students' answers, three in-depth interviews took place to collect additional information that could help evaluate the current situation and understand what needed to be reviewed and changed to increase student engagement in the online component of the blended curriculum.

A mix of Ahlfeldt, Mehta and Sellnow's (2005) survey of student engagement (SE) and Dixson's (2015) online student engagement (OSE) scale were used and adapted to the context under investigation. The SE survey was designed based on the National Survey of Student Engagement (NSSE) in the U.S. It was used to measure student engagement in the classroom and scored high on validity and reliability (Ahlfeldt et al., 2005). Therefore, this survey is used to draw a holistic picture of students' attitudes towards and perceptions of their BL experience. Furthermore, the questions that were used in this survey address the three concepts of student engagement described in the theoretical framework section: behavioural engagement, emotional engagement and cognitive engagement (Fredricks et al., 2004; Trowler, 2010; Balwant, 2018). The survey consisted of nine questions: eight closed questions using a five-point Likert scale, and one open-ended question that allowed students to comment and provide some suggestions.

Following the quantitative results of the survey, three in-depth interviews that consisted of three questions collected qualitative responses from three volunteer participants. The questions addressed the changes that need to be implemented in the IL curriculum; the additional skills that need to be included; and students' reasons behind their preference of online modules over face-to-face. The data from the interviews complemented the survey results and provided not only clearer explanations and insights into students' perceptions and preferences, but also valuable suggestions.

6. Results

The following sections present the survey results using the three concepts of student engagement described in the theoretical framework section: *behavioural engagement*, *cognitive engagement*, and *emotional engagement*. The survey results are followed by the interview results that focused on three main themes: *improving the IL curriculum, including new IL skills*, and *preference for online modules over face-to-face sessions*.

6.1 Survey Results

The survey consisted of nine questions, eight closed questions using Likert scale and one open-ended question. Out of 17 premedical students enrolled in this course, 13 (76.47%) completed the survey. The detailed list of questions is provided in Appendix A.

6.1.1 Behavioural Engagement

Three out of five survey questions (Q1, Q2, & Q3) were of a behavioural nature. For Q1, "I check the online modules content on a regular basis", over half of the participants agreed or strongly agreed (53.84%) while three participants disagreed (23.08%) and three (23.08%) were neutral to that statement (see Figure 1). This question reflects behavioural engagement, and when compared to the three dimensions discussed by Trowler (2010), it can be deduced that more than half of the participants manifested a positive engagement, while three participants were not engaged, and three participants showed negative engagement.

In Q2, "I submit the online quizzes on time", all participants agreed (30.77%) and strongly agreed (69.23%) to this statement (see Figure 2).

Q3 inquired whether participants help their classmates complete the online modules and quizzes. This question intended to measure participants' behavioural engagement

and their interactions in order to complete the required task. More than half of the participants (53.85%) agreed to this statement; four participants (30.77%) were neutral; one participant disagreed (7.69%); and one strongly disagreed to this statement (7.69%) (see Figure 3).

Figure 1. Participants' responses to Q1 show that 53.84% check the online modules regularly.

Figure 2. Most of the participants indicated that they submit the online quizzes on time.

Figure 3. Distribution of participants' answers to Q3.

Figure 4. Distribution of participants' answers on Q5.

Figure 5. Participants' answers to Q6 (left) and Q7 (right).

6.1.2 Cognitive Engagement

Q5 measured cognitive engagement and collected participants' perceptions of the usefulness of the IL skills when engaging in other courses. When asked to rate the following question, "I apply the IL skills to other courses (EAP, Biology, Global Health...), the majority of the participants agreed (69.23%) and strongly agreed (7.69%) while two participants were neutral (15.38%) and one participant disagreed (7.69%). The results show that integrating IL learning outcomes with other courses can be beneficial to increase participants' awareness and practice of new skills.

Q6 and Q7 explored the cognitive dimension and implicitly collected students' feedback regarding the usefulness of the face-to-face sessions in comparison with the "IL online modules". The purpose was to indirectly investigate the correlation between the two methods of the blended IL curriculum. Q6 collected students' perception of the class activities and whether students saw them as an opportunity to practice the content of the online module. Most of the students agreed and strongly agreed (61.54%) with this statement. Similarly, in Q7, "I find the class activities a chance to understand some concepts that were not clear in the online modules", most of the participants agreed to this statement (69.23%).

6.1.3 Emotional Engagement

Q4 was written to collect participants' emotional engagement in the IL course and, therefore, their perception of its value in their everyday life. In response to "I find the IL course materials relevant to my life", two participants (15.38%) disagreed with this statement, five participants (38.46%) were neutral, five participants agreed (38.46%) and one strongly agreed (7.96%) (see Figure 6). These results suggest that more examples from everyday information seeking and evaluation should be integrated in the future to allow participants to value or appreciate the transferability of these skills into their daily quest for information.

Q8 and Q9 investigated the emotional dimension of SE. For Q8, students were asked to choose which of the two methods they preferred. It appeared that most of the participants (69.23%) preferred the online modules whereas four participants (30.77%) liked both methods. When asked to explain their choices in Q9, nine students' answers came as follows:

"The face-to-face sessions can be redundant and unnecessary if you go through the online sessions."

Figure 6. For Q4, participants' answers were divided based on the relevancy of IL course materials to their everyday life.

"It is accessible anywhere and informational."

"It's more knowledge over less time. "Studying smart". Online is just as effective as face to face."

"I don't like the face-to-face sessions, but I like the assignment given as it acts as a practice. I don't like that IL is graded."

"The IL sessions were too long for the modules and the online modules are more beneficial because it does not pressure students into spending more than an hour on a citation skill."

"It gives me a chance to learn the topic on my own time and pace, as we have a very stressful schedule."

"They're easy to follow and understand so we don't really need to come here at 8 in the morning for a repetition of the same content."

"Because the online modules are faster and there won't be a need to make face-to-face sessions if one understands the online modules, which is what happened to me this year."

"They are quick and easy to understand."

Four students indicated that they “like them both” for the following reasons:

“I like the online modules because they give an introduction to the concept that are going to be explored during the face-to-face sessions. This allows for a better understanding of the material which enhances the learning process and prepares the students ahead of time.”

“To practice and understand some concepts that were not clear in the online modules.”

“Because each has an advantage and disadvantage.”

“They are both beneficial in a way that if people read online modules and do not understand they can ask questions during face-to-face sessions.”

6.2 Interview Results

The aim of the interview is to investigate the extent of engagement in the IL course, especially the online modules. The detailed interview questions (IQ) and answers of each participant are available in Appendix B. The interview data is presented based on the following three main sections: improving the IL curriculum; additional skills that need to be included; and students’ preference for online modules over face-to-face. The theoretical framework’s engagement dimensions are described and linked where appropriate to provide a clearer explanation of students’ answers.

6.2.1 Improving the IL Curriculum

IQ1 aimed to understand what changes need to be implemented in the course to make it more relevant to students’ daily life. Students’ answers provided three different perspectives that are equally important, and each perspective touched on one of the three SE dimensions.

Participant 1 (P1) found that the examples used when teaching a specific skill “*might be out of context*” and uninteresting or dull for the students which can be linked to the cognitive engagement dimension of the SE theory. P1 provided the example of scholarly versus popular resources and how students do not use print magazines anymore, which might be confusing for students. P1 suggested using examples from social media, such as Instagram and Twitter, and other widely used digital platforms and commercial websites to show them good and bad examples. P1’s answer came as a surprise as the current curriculum did not consider including social media, which is essential with today’s student population.

For P2, the content was 100% spot on. P2 even gave an example from a recent encounter describing how the skills taught through IL were used to decide to “join a diet centre” and checking out the credibility of the vendor. P2 also mentioned that some senior college peers made her realize the importance and applicability of these skills in their everyday study habits and daily life in general. The interviewee explained,

“I also know from my friends, one in premedical 2 year and the other one in medical year, that they are using these skills extensively in their studies too as they become part of their daily research and studying behaviour.”

This comment depicts the student’s behavioural and cognitive engagement and is in line with the findings of an earlier study by Kingsley et al. (2011), which confirms that IL skills should be integrated early in the curriculum in order for students to acquire these skills and adopt them in their daily learning habits.

P3 had a more of a middle ground approach where he thought that the way some of the modules were developed made them more relevant than others. He added,

“On the very first day of the IL course, you told us a story about a famous doctor who lost his medical license for fabricating research data and I think this story stuck with all of us. Things like that help us see the importance of these skills.”

This statement can be linked to the emotional engagement dimension of the theoretical framework that underpins this study.

6.2.2 Including New IL Skills

IQ2 asked participants to suggest other skills that they wanted to be included in the IL curriculum.

P1 found that IL provided several transferable skills into other courses and suggested introducing some skills on how to prepare scientific reports.

For P2, the skills were comprehensive and easily transferable to other courses and had no suggestions. As a follow-up question, when mentioning to P2 that another participant suggested adding a skill on how to prepare a scientific report, and if she felt the need for something similar, P2 answer was:

"Depending on the schools we are coming from, some students might need a different set of skills. For example, I know how to create a lab report and include all the sections (intro, aim, subject, title, picture, etc.) as I have done this at school, but I know that some classmates were struggling with that."

P3's answer resonates with P1 as he also suggested collaborating with the Biology instructor to design a session on how to put together a lab report as the requirements for formatting and style were confusing.

6.2.3 Preference for Online Modules Over Face-to-Face Sessions

Participants' answers to IQ3 provided insights about students' preference for online modules over face-to-face sessions. Based on the survey questions, the majority of the students confirmed that they found the face-to-face sessions an opportunity to practice the content of the online modules and checked their understanding of some of the concepts covered online. All participants' answers to this question can be linked to their emotional engagement with the blended course since it taps into their feelings, interest, and values.

P1 and P2 explained their preference for online modules since "*face-to-face sessions were in the morning!*" However, both participants found the face-to-face sessions important to "*familiarize ourselves with the topic*" (P1) and "*when we are in the classroom we HAVE to do it because the instructor is there, while if it is online we think we can do it anytime and sometimes we never do*" (P2).

P2 also suggested we only use online modules unless there is a big assignment or new skill that necessitates a face-to-face session, such as a literature review. This is also in line with P3 who thought that while "*the face-to-face sessions should be compulsory*," some other simple skills can be taught through the online modules, such as in-text citations.

P3 also suggested having the online modules as a back-up for students to refer to when they need. In fact, this was shown in a recent study by McGuinness and Fulton (2019) where they argue for making e-learning tutorials "reusable learning objects" for students to access when they need to reinforce a certain skill.

7. Discussion

Results from the survey and interviews will be discussed in relation to the relevant literature.

7.1 Research Question 1

For RQ1 - *What are the perceptions of premedical students about their engagement in the biweekly IL face-to-face sessions?* - it can be inferred from students' answers to survey questions 6, 7, 8 and 9 that although most of the students prefer online modules, they also find face-to-face sessions a chance to understand and practice the skills presented in the online modules. The reasons for this dissonance can be understood in light of the literature that indicated how students prefer online courses for their flexibility and asynchronous access, yet students also "lament having no face-to-face experience" (Dziuban et al., 2011). When this question was brought up during the interviews, participants explained that the schedule of the face-to-face sessions, early in the morning, is what might have influenced the students' answers to the survey questions. However, the interviewed participants considered that some practical skills necessitate face-to-face sessions.

Based on the literature (Moskal et al., 2013; Kong, 2014; Van Dam, 2001, as cited in Sriarunrasme et al., 2015) and the results of this study, it can be concluded that although students found the face-to-face sessions redundant and unnecessary, they play an important role in bringing students to interact together towards solving a problem and to help them internalize the skills taught in the online modules. It is also necessary for student-faculty interactions as students "*can ask questions directly, and the instructor can make sure that [students] understand the module*" (Interviewee P1). However, the instructor needs to be selective as to what skills need face-to-face sessions and when to include them in the curriculum. This calls librarians, whose role is to design, implement, deliver, and assess such sessions (Shank & Bell, 2011, p. 105) to revisit their curriculum based on students' needs, and consider using relevant technology to complement face-to-face sessions rather than provide redundant information. This finding further emphasizes the importance of collaborations between librarians and faculty when designing curricula and delivering instruction to ensure alignment of skills.

7.2 Research Question 2

For RQ2 - *What are the perceptions of premedical students about their engagement in the online component of the IL curriculum?* - data collected from survey questions 1, 2, 3, 4, 5, 8 and 9 show that most of the students perceive themselves as engaged in the online component of the IL curriculum by checking the content on a regular basis, submitting quizzes on time, and helping each other complete the online tasks.

What was intriguing was that two of the three interviewed participants explained that they preferred the online component as it gave them flexibility in accessing the modules. However, they also confessed that the idea of having the online modules available anytime encouraged some students to procrastinate and subsequently fail in checking the content before the face-to-face session.

Nevertheless, the interviewees provided some useful suggestions to enhance the content of the IL modules.

Teaching in a medical school leads to the assumption that what needs to be covered should fall into the academic, scholarly realm. However, results from the interviews provided an emerging interest in the use of social media in future curriculum and instructional design. Students suggested replacing the module on ‘evaluating scholarly and popular resources’ with evaluating social media tools and showing students good and bad examples. Other suggestions were more aligned with students’ academic needs such as ‘preparing a scientific report’ and formatting a ‘lab report for Biology course’. What can be concluded from the collected data is that the IL curriculum needs to be revisited to include new emerging skills that students use in their everyday life, particularly the ubiquitous social media that the digital natives use daily.

7.3 Overarching Research Question

The overarching RQ — *What are the key differences and similarities between Arab premedical students’ engagement in the face-to-face component versus the online component of a blended information literacy (IL) curriculum offered at a branch campus of an American medical college in Qatar?* — is formulated to draw a clear conclusion about how to improve the IL curriculum.

Through the analysis of the collected data, it is found, that students prefer the online component for its flexibility and asynchronous accessibility and perceive themselves to be more engaged in it. They also found that the face-to-face sessions are a repetition of the online modules and can be reduced to a minimum. However, the data also suggest that students still need the face-to-face component to put into practice the skills learned in the online modules, interact with their peers and collaborate as a tool to internalize the learning process, and finally, have access to the teacher interaction where they can ask questions pertaining to the learning materials.

7.4 Study Limitations

Other aspects of student engagement that were not addressed in this study due to its scope need to be investigated in future studies, such as the shifting role of the teacher as a moderator of the e-learning experience. This role is crucial to the success of BL, especially when students are not self-directed learners and unaware how to benefit from e-learning.

Another important tool that needs to be investigated is what McGuinness and Fulton (2019) call “reusable learning objects” (p. 2). These objects or artefacts should be created and made available online to provide students with skills and knowledge when needed. Students’ access and use of such objects can be tracked to assess the usefulness and appropriateness to their academic level.

8. Conclusion

Being digitally literate does not imply being information literate. Today’s learners need to be equipped with skills to critically evaluate the endless deluge of information and effectively use it not only in their educational pursuits but also for lifelong learning. To contribute to this endeavour, this study investigated Arab premedical students’ perceptions of a blended IL curriculum integrated in an EAP course at a branch campus of an American medical college in Qatar. The study collected students’ feedback by providing them with an opportunity to voice their opinions and give suggestions through a survey and interviews. The feedback would assist in redesigning the course learning outcomes and enhancing the online modules as well as the face-to-face component.

This study contributes to the current literature on student engagement through the integration of IL in higher education and the use of technology in delivering a blended learning experience to first year Arab premedical students. The study concludes that students’ perceptions of a blended IL curriculum are impacted by the importance they attribute to the topics taught in IL. They seem to prefer just-in-time, online and asynchronous access to content with an optional face-to-face attendance that would help them learn about a skill when they need to use it. Furthermore, the findings of this study contribute to the literature on online and blended learning by stressing the importance of accommodating students’ preference for online asynchronous learning, while also providing them with the choice of attending face-to-face, synchronous sessions, be it online or in-person.

Based on these findings, the IL curriculum should be revised and tailored to the specific needs and the unique context where teaching and learning take place. It is im-

portant to provide a well-rounded learning experience to students that carefully considers their environment, culture, and previous education experience. An asynchronous course format with non-compulsory online live sessions might be the answer to a flexible approach to online and blended learning. This format should be investigated in future studies to assess whether it accommodates students' engagement preferences and supports the contextual circumstances that might occur in higher education.

Finally, it is worth mentioning that this study took place right before the pandemic outbreak and the emergency learning situation that was imposed mid-March 2020. Therefore, the results of this study will be useful in guiding the development and delivery of the next IL curriculum, and future studies can be undertaken to assess the success of an online, asynchronous learning approach for the IL curriculum.

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Appendix A. Survey Questions

IL Online Modules	Dimension
1. I check the online modules content on a regular basis.	Behavioural
2. I submit the online quizzes on time.	Behavioural
3. I help my classmates complete the online modules and quizzes.	Behavioural
4. I find the IL course materials relevant to my life.	Emotional
5. I apply the IL skills to other courses (EAP, Bio, Global Health...).	Cognitive
IL Face-to-Face Sessions	
6. I find the class activities a chance to practice the content of the online module.	Cognitive
7. I find the class activities a chance to understand some concepts that were not clear in the online modules.	Cognitive
Improving the IL Curriculum	
8. Which of the two methods do you prefer?	Emotional
9. Why?	Emotional

Appendix B. Interview Questions and Participants' Answers

The aim of this interview is to investigate the amount of engagement in the IL course, especially the online modules.

1. When students were asked whether they find the IL course materials relevant to their lives, their answers were divided: half of them agreed and the other half disagreed. What can I do to make IL course materials more relevant to your lives? (Note to interviewer: Explain what I mean by relevance to life to avoid any confusion).

Responses:

P1: The modules discussed popular versus scholarly resources. Such examples might be out of context for us as we don't use them. You can add examples about social media resources, e.g. tourism websites, Instagram, how to order online materials... Some resources that we use in our daily life not only for research purposes. You can also give us some hints about red flags in social media.

P2: The modules were relevant because, for instance, yesterday I was joining a diet centre and they sent me a link to proceed with payment, but I wasn't sure if this website was a legal one, so I googled the company, checked that the links are working, looked at the url. Another example is that of these nutrition videos they send over social media about healthy drinks for weight loss, so now I know that I can go to PubMed or WebMD to look up the information and ingredients used.

I think the students did not clearly understand this question in the survey, because now you explained it to me in a clear way.

I also know from my friends, one in premedical year and the other one in medical year, that they are using these skills extensively in their studies too as they become part of their daily research and studying behaviour.

P3: On the very first day of the IL course, you told us a story about a famous doctor who lost his medical license for fabricating research data and I think this story stuck with all of us. Things like that help us see the importance of these skills such as referencing and avoiding plagiarism.

What I find more helpful is when you provide us with good examples that we can follow rather than pointing out what not to do. When you demonstrated the use of advanced search techniques such as Boolean operators, quotation marks, truncation, we were able to understand the logic behind them and I notice that we know incorporated them into our regular search.

2. One of the questions inquired whether students apply the IL skills to other courses in their program (EAP, Bio, Global Health...), and the majority of the participants agreed with this statement. I would like to know from you what other practical or helpful skills you would like to learn through IL that would be applicable to other courses?

Responses:

P1: The IL course covered a lot of skills that were transferable to other courses and it helped us a lot especially with citations. One thing that I would like to suggest to include in IL is how to write and format lab reports because we use this in chemistry and biology.

P2: I did use the IL skills in other courses. For example, in the biology report on cat dissection and in the Global Health course, we had to choose between using MLA or APA as long as we remain consistent, and I was able to put

into practice this skill that I learned during IL. Also for the chemistry report, we need to summarize and cite resources and I was able to recall and use these skills from IL.

Depending on the schools we are coming from, some students might need different set of skills. For example, I know how to create a lab report and include all the sections (intro, aim, subject, title, picture...) as I have done this at school, but I know that some classmates were struggling with that.

P3: I would suggest you ask the Biology instructor to give you previous lab reports to be used as example or template for us to start a new one. The Biology instructor wanted us to use APA style but she had it customized to her preference which made it a little confusing for us. It will be very helpful if you can explain to us the style used for a lab report and help us start putting one together during your class.

3. Most of the students answered that they prefer the online modules over face-to-face (they find face-to-face redundant, unnecessary while online modules are quick, easy to understand). However, most of them also found that the face-to-face sessions were an opportunity to practice the content of the online modules and check their understanding of some concepts that were not clear in the online modules. What do you think about this contrast in their answers? Can you think of reasons why? (short attention span, intensive schedule, lack of interest...)

Responses:

P1: Because face-to-face sessions were in the morning. Personally, I find the face-to-face very helpful. The online modules give us the basics, introduce the concept and we get the chance to do small homework and familiarize ourselves with the topic but face-to-face make us understand more by putting everything together. We can also ask question directly, and the instructor can make sure that we understand the module.

The only drawback is time. I understand why my classmates were aggressive about this question because it is hard to wake up early and arrive at 8 am.

P2: It is a morning session! Face-to-face were useful especially the literature review session. It was very important and necessitated a face-to-face session. Face-to-face sessions should be used for big assignments and new skills like this, and when we are in the classroom we HAVE to do it because the instructor is there. While if it is online we think we can do it anytime and sometimes we never do.

P3: The search techniques had an online module and a face-to-face session and I found the face-to-face session much better. In fact, I think the face-to-face sessions should be compulsory. However, for some other skills like how to do in-text citations, an online module would be sufficient and can be used as a backup for students to consult when they need to use it.