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Making the connection: Examining the relationship between undergraduate students' digital literacy and academic success in an English medium instruction (EMI) university

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Abstract

The transition through the first year of university study is challenging for the majority of students. For students from Culturally and Linguistically Diverse (CALD) backgrounds, commencing studies in an English-Medium Instruction (EMI) university program presents a number of specific challenges. These students are faced with meeting both language demands as well as learning expectations of the institution, which often differ markedly from their previous formal learning experiences. Developing CALD students' digital literacy practices has been shown to lead to improved academic performance, success and retention in some higher education settings. This paper focuses on the digital literacy practices of undergraduates at a national public university in a Gulf State. Results from a survey and focus groups are analysed to identify the students' access to and use of digital technologies, in order to better understand how their academic success can be enhanced through digital literacy development. The study identifies a disconnect between students' perceptions of their digital capabilities and the institutional requirements for study. The research recommends that providing integrated, institution-wide digital literacy development focused on accessing, assessing and incorporating online resources in their work, will help improve transitioning CALD students' preparedness for undergraduate study in this and other EMI universities.

Keywords Academic literacy · Digital literacy · Information literacy · English-medium instruction (EMI) · Culturally and linguistically diverse (CALD) students

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1 Introduction

Undergraduate study presents an exciting challenge for commencing students. As they immerse themselves in their chosen discipline, developing the knowledge and skills they will need for their future careers, commencing students must also come to terms with the teaching and learning expectations of a new learning environment (Gravett et al. 2020; van der Meer et al. 2018).[1] In an era of increasing participation in higher education internationally, it is important to understand the specific challenges faced by particular cohorts of students as they undertake undergraduate studies. This paper focuses on some of the challenges students from Culturally and Linguistically Diverse (CALD) backgrounds face adjusting to the demands of English Medium-Instruction (EMI) university programs. It explores an academic literacies approach to supporting these students achieve their study goals through a case study of students enrolled in a public university offering EMI programs to CALD students in a Gulf State.

Student achievement can be measured in a number of ways, such as Grade Point Average (GPA) or success rate (number of subjects passed/number of subjects studied), both of which are determined in part through students' performance on individual assessment items. To successfully complete assessments in contemporary universities students are typically required to use a range of technologies (e.g. laptops, web browsers, databases) and concomitant academic skills or practices: *finding* information, *evaluating* that information (for relevancy, credibility, bias), *summarising*, *paraphrasing* and *synthesising* this information in a report or essay (Beetham et al. 2019; Joint Information Systems Committee [JISC] 2014). Studies have shown that when CALD students underperform in assessments, it is often due to their lack of command of these practices and (mis)understandings of the required conventions of academic English writing (Bitchener and Basturkmen 2006). This can be seen when they include information from inappropriate sources in their essays and through their unintentional breaches of academic integrity rules (which are underpinned by fundamental cultural notions of text authorship and ownership, see Pennycook 1996), when they summarise, paraphrase and synthesise incorrectly. For example, poor performance in written assessment has been attributed in part to CALD students' lack of awareness of and command of standard academic English referencing practices (e.g. Chinese students, Flowerdew and Li 2007; Indian students, Handa and Power 2005). In this paper, these challenges are addressed using an academic literacies theoretical framework with a particular focus on one academic literacy relevant to university study: digital literacy.

2 Review of the literature

2.1 Academic, information and digital literacies

An established approach for supporting CALD students achieve their higher education goals in EMI programs is to develop their academic literacies. The

[1] Transition pedagogy of first year students addresses the challenges of a wide range of first year cohorts through emphasising the importance of institutional responses which encourage student engagement, developmental support, and belonging (Kift 2015; Nelson et al. 2012; Zepke 2013). Of these three approaches developmental support is the focus of this paper.

academic literacies approach constitutes a specific epistemology which views literacy as a range of learned social practices (Street 2009) that enable a transformation in students (Lillis and Scott 2007). The approach focuses on developing students' use of academic *practices* needed in their studies. It foregrounds that which is appropriate in a specific context, such as the conventions of academic English writing in a university, or more specifically in a university discipline. These are the very practices that research indicates that CALD students are often unaware of, such as how to paraphrase and how to use in-text citations in their writing (Flowerdew and Li 2007; Handa and Power 2005). In fact, as Catterall et al. (2016) note, CALD students sometimes underperform in EMI university programs by employing academic practices, such as rote memorisation and unreferenced citation, that have helped them achieve in previous non-EMI educational contexts. A focus on academic literacy practices then, offers a frame for linking academic English with what students as "individuals, as socially situated actors, do, both at the level of 'context of situation' and at the level of 'context of culture'" (Lillis and Scott 2007, p.11). This approach enables these CALD students to meet the requirements of academic English writing assessment tasks in EMI university settings.

It is not only CALD students who benefit from academic literacy instruction. Higher Education specialists have argued that students, irrespective of background, are often unfamiliar with the broader academic culture and very discipline-specific textual expectations they encounter (Hammer and Green 2011). Coldwell-Neilson et al. (2019) found that undergraduate students in Australia were not as digitally capable as expected by academic staff, and recommended the explicit teaching of digital literacy skills throughout the curriculum. At a research intensive university in the UK, Gravett and Kinchin (2020) show that poor command of academic literacy practices (referencing) was leading to increased numbers of academic misconduct cases and the authors recommended developing students' academic literacy practices.

Two related academic literacies discussed in the literature are relevant here: information and digital literacy (see Fig. 1). The first is the established tradition of information literacy, defined as a set of practices enabling individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association [ALA] 1989). Information literacy practices mediate both print and digital media; whereas, the related digital literacy unsurprisingly focuses exclusively on practices situated in digital contexts. A range of digital literacy definitions are used in the literature (see Spante et al. 2018 for a systematic review of these) and across higher education institutions (Coldwell-Neilson 2017). Other emerging terms are used to describe closely related capabilities (e.g. digital dexterity is preferred by the Council of Australian University Librarians [CAUL] see O'Sullivan et al. 2019).

Many digital literacy definitions include reference to the digital capabilities covered in Beetham and Sharpe's (2011) e-learning model (see Fig. 2), representing a hierarchy of: 1) *access* to technology; 2) use of ICT *skills*; as well as 3) the ability to use higher-order *practices* mediating how learners

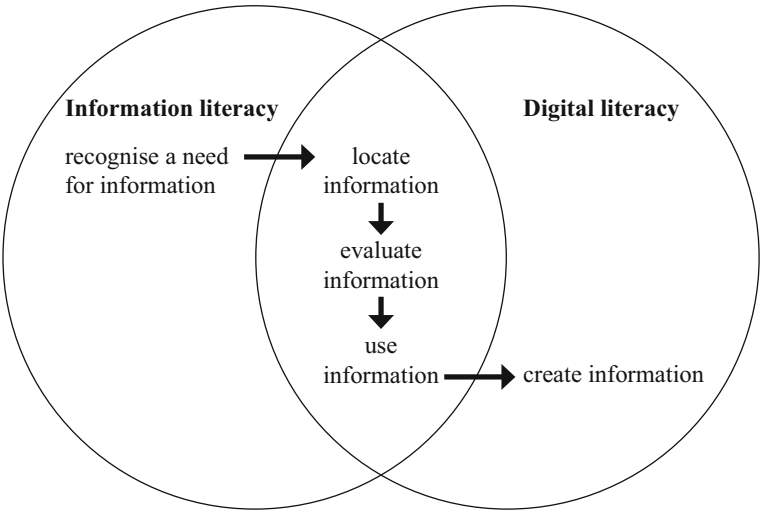

Fig. 1 Two related academic literacies: information and digital literacy

engage with information and others.[2] JISC (2014) further proposes that digital literacies encompass a range of other capabilities that they present in their seven elements model.[3] Once students have *access* to technology, such as smartphones, tablets or desktops, they use ICT *skills* to drive software applications such as browsers and databases to perform tasks such as locating online information. Definitions of digital literacy typically go beyond these ICT *skills* in emphasising the importance of *practices* including evaluating the relevance, authority, currency and purpose of information found online. These higher-order practices in Beetham and Sharpe's (2011) model share commonality with the ALA definition of information literacy. More recent digital literacy definitions however often also include what Beetham and Sharpe consider as 4) attitudinal attributes, capturing how students appropriately create and disseminate information in digital spaces (Ávila and Pandya 2013). A definition of digital literacy, which draws on Beetham and Sharpe's (2011) work, is used in this paper: "the ability to access, critically assess, use and create information, through digital media in engagement with individuals and communities" (Roche 2017, p. 43). It is important to stress that in using an academic literacies approach, digital literacy as defined here focuses on socially situated academic literacy *practices*, aiming to help students develop flexible strategies in response to the needs of university learning and their specific discipline, such as, how to access information online, how to evaluate relations of authority (credibility and reliability) and purpose (through bias) and how to use that information in one's own work (through paraphrase, referencing). An example of a teaching tool to communicate these practices to students is the CRAAP Test (Blakeslee 2004).

[2] Higher-order processes in learning include systematic decision making, evaluative thinking and rule usage (Hickendorff et al. 2009).

[3] These include media; information, and ICT literacy; digital scholarship; communications and collaboration; learning skills, and career and identity management.

2.2 Statement of the problem

In an era of increasing EMI university enrolments of students from diverse CALD backgrounds (UNESCO Institute for Statistics 2015), it is important to understand students' digital capabilities; their access to technology and the digital literacy practices, skills and attributes they are able to use during their higher education journey. This can help ensure that students are prepared for the expectations of the academy (Coldwell-Neilson 2017; Morgan 2018; Roche 2017) and to identify what the institution can do to support students to develop their digital literacy capabilities. Without an understanding of students' digital literacy capabilities, higher education providers run the risk of approaching digital literacy as something which students have (Bhatt and Mackenzie 2019). This in turn can lead to cohorts of CALD students who have not had sufficient opportunity to develop the requisite digital capabilities and are more likely to fail in their studies, achieve lower GPAs and are less likely to complete their studies (Roche 2017).

There is a growing awareness that students' informal ICT skills do not transfer well to academic learning situations (Coldwell-Neilson 2017; Littlejohn, Beetham & McGill., 2012). For example, research has shown that while many students are able to use social media tools for informal communication with friends and family, they often lack the digital literacy practices required in academic contexts (JISC 2014). Ganapathy and Kaur's (2015) study of 110 s year CALD university students in EMI programs in a Malaysian public university found that students had good access to digital technology but noted that they had difficulty using technology to search for relevant and authoritative information, as well as recording information with appropriate citations and references. In their study Ganapathy and Kaur (2015) found students were judged to perform poorly when they "had to evaluate the currency of information and... Especially [with] information from the Internet" (p 10), a finding which has been seen in other EMI contexts (Nasah et al. 2010). Given the range of quality of information online, in its veracity and reliability, and that online search results are generated in part by the implicit biases, motivations, and intentions of the

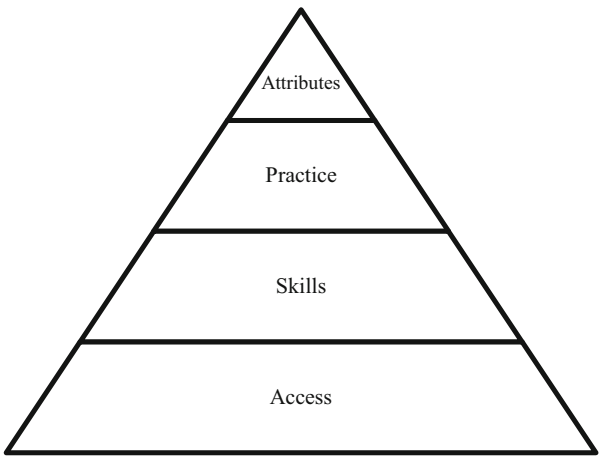

Fig. 2 Beetham and Sharpe's (2011) developmental e-learning model

companies who design the search algorithms (Bhatt and Mackenzie 2019) the ability to evaluate information found online is essential to both university study and life beyond the classroom. These practices of assessing the relevancy, currency and authority of online information and using it in their own work are the very academic literacy practices a digital literacy approach addresses. Any use of social media to enhance and positively impact educational performance must be well considered and focused (Selwyn and Stirling 2016[4]) and used in meaningful, learning-centred ways (Duncan-Howell 2012) rather than incidental and based on ill-founded assumptions of students' digital literacy capabilities.

Once a particular cohort's digital literacy is understood - their access to, uses of and practices with technology - measures can be designed and implemented to address their developmental needs. Bawden (2001) notes that university preparatory programs and pathways play a central role in encouraging learners to communicate with the learning tools and techniques needed for their studies. In one longitudinal study (Roche 2017), after identifying issues with CALD students' digital literacy capabilities and remodifying the curriculum, results indicated that those students who took a subject with an explicit digital literacy focus (in content, assessment and learning outcomes) showed higher GPAs, success and retention rates than CALD students who had not received explicit digital literacy instruction. Those students who had completed the subject with a digital literacy learning outcome also reported a better understanding of academic integrity practices and related institutional policy and less difficulty accessing course content than their CALD peers who had not taken the subject.

3 Research questions

This paper then, does not approach digital literacy as something which students have (or do not have), but views it as a capability and range of practices that can be developed (Bhatt and Mackenzie 2019; Gourlay and Oliver 2018). This case study sets out to investigate CALD students' digital literacy in one institution by answering the following research questions:

1) What are the students' patterns of digital access and ownership?
2) What are the students' self-reported digital literacy capabilities (in terms of ICT skills, practices and attributes)?
3) How do these connect with their academic experiences?

4 Methods

4.1 Context

The research was carried out at a public university in a Gulf state offering EMI programs. At the time of the study it had approximately 15,000 students (part-time

[4] This special issue of Learning, Media and Technology surveys the use and impact of social media on education.

and full-time, undergraduate and graduate) of which over 80% were female and over 600 Faculty members. The majority of students were local but almost 17% were from other nationalities resident in the country, with 1% being from other GCC countries. The university consists of 9 Colleges[5] and holds WASC[6] accreditation. The majority of the programmes and courses are taught in English but there are several Arabic-medium courses in different disciplines (e.g. Arabic Language and Literature courses). Students must have achieved a specified level of proficiency in English[7] to be accepted, as well as meeting requirements through completion of a maths and Arabic placement test.

Access to ICT for teaching and learning is extensive; Blackboard is used for all courses, and; Wi-Fi connectivity is present across the campus. Students have use of their own devices, mainly smartphones but also laptops and tablets to a lesser degree and the university provides labs and computer rooms, especially for specialised software. As part of its '21st Century Themes' the university has incorporated within the Student Academic Success Program (SASP) of Core Subjects a strand on 'Information, Media and Technology Skills' (further divided into 'Information Literacy', 'Media Literacy' and 'ICT Literacy'). Whilst this is an indication that the salience of academic literacies has been recognised, research shows that if these initiatives are to succeed, they need to be situated within a broader, comprehensive framework for digital literacy and bridge the gap between students' current capabilities and institutional requirements (Miller 2015; Roche 2017).

4.2 Methodology

A mixed methods approach (Crocker and Heigham 2009) was used to obtain data for this research consisting of four focus group interviews (1 male students only, 2 female students only and 1 mixed gender group) and a survey conducted amongst male and female undergraduate students.

4.3 Instruments

Focus group interviews were undertaken to gauge students' understanding of the concept of digital literacy and to determine their familiarity with and use of ICT tools at university by engaging in discussions to both guide and supplement the quantitative data obtained from the survey. They provided an opportunity to examine how familiar students were with terminology relating to digital literacy as well as the concept of digital literacy itself. The survey was based on the pre-existing ECAR Survey (Dahlstrom et al. 2012) questions (35 plus questions on demographic and general data) with modifications made for language and local context in keeping with previous research (Morgan 2018). Questions were modified to obtain information about digital literacy practices although the words used reflected those students were familiar with as gauged in the interviews.

[5] Humanities and Social Sciences; Business and Economics; Education, Science, Engineering; Medicine and Health Sciences; Food and Agriculture; IT, and; Law and; University College. In addition, it has the College of Graduate Studies.

[6] Western Association of Schools and Colleges (Senior College and University Commission); an accrediting body based in the USA.

[7] An EMSAT minimum score of 1250; a TOEFL minimum score of IBT = 70 / ITP = 525 or an IELTS minimum score of 5.5.

This survey explored students' digital literacy in alignment with the first three aspects of Beetham and Sharpe's (2011) digital literacy model; access (and ownership), skills and practices. Qualtrics was used to administer the online survey during classes.

4.4 Data collection

The majority of the fieldwork was conducted during the Summer and Fall terms of 2019 at the University's main campus. Interviews were conducted prior to the survey to engage in the concepts and issues that had been identified from the literature and to develop the survey focusing on the research questions. The interview was semi-structured and consisted of several broad themes, including, use of technologies (social and educational); student and staff experiences of ICTs; credibility of information, and; self-study. The open-ended questions enabling participants to discuss areas relating to the topic which they felt were important and also provided opportunities to prompt for details and clarification. The survey data was collected by the researchers and assistants with the help of academic staff at the institution who agreed to have their classes participate in the study. Help was available to survey participants during the process in case of technical issues and clarification about terminology was also given.

4.5 Data analysis

Interviews were transcribed and analysed by the researchers using NVivo qualitative data analysis software. A recursive process was employed by which the transcripts were read and re-read allowing key themes to be identified and coded within each interview question (O'Shea 2016). These themes related to the questions in the interview schedule which were examining access, skills and use/practice of ICT and digital tools and technologies and consisted of the following: Blackboard; curriculum; devices; digital literacy; educational/academic use; evaluation and credibility; faculty/staff; information literacy; online and blended learning; self-taught/learnt; skills transfer; social media; social media for educational use, and; tools, applications, websites, etc. Emerging analytical categories which were not apparent in the literature or the interview questions were also identified (Flick et al. 2004). Distinct, yet interconnected themes were identified and quotes were then selected to capture the essence of each of these themes (Creswell 2013). The authors cross-referenced the nodes to ensure accuracy of coding. For the survey results, the tools available within Qualtrics were used to generate statistical analyses in line with the themes identified above covering the broad areas of device access/ownership/use; experiences of technology for academic purposes; tools/resources, and; communication.

4.6 Participants

In total 344 survey responses were completed by students, the majority of whom were in introductory level subjects.[8] Eighty-three percent of respondents were Emirati; 14%

[8] 487 students were invited to take the survey using a link sent via emails. 360 started the survey, of which 344 completed it, giving a response rate of 70%. The survey was administered in several different classes during which the researcher and research assistants were present.

non-Emirati Arabs and about 3% non-Arab. Almost 95% went to high school in the UAE, though the type of school was not specified. The participants were undergraduate students studying in different colleges, though the majority (57%) were from Humanities and Social Sciences and no student was from Medicine. Table 1 gives the gender and age distribution of survey respondents.

BERA's (2011) ethical guidelines were applied (i.e. informed consent and right to withdraw from the research). Approval was also granted by the university's Social Sciences Research Ethics Committee. The majority of participants in the focus group interviews were from the department of Mass Communication and they were asked to describe their 'average daily routine' in order to understand access, use and digital practices. During the group discussions students were asked to list and discuss the tools, applications, websites etc. that they used for both social and academic purposes and ask for recommendations of ICT development they would like from the university. These discussions provided opportunities for students to describe and evaluate their knowledge and use of ICT tools and make connections to digital literacy skills and abilities.

5 Results and discussion

5.1 Access, ownership, and skills

Data from the survey shows that overall rates of device ownership and access were both high amongst the respondents from this university. Participant device access was marginally higher than in a national survey of US undergraduate students (smartphone 95%, tablet 40%, laptop 91%, desktop 35%, in EDUCAUSE 2018), and for Australian students in university bridging courses to undergraduate studies (smartphone 93%, tablet 43%, laptop 90% in Morgan 2018). Smartphones were the most commonly accessed and owned device of the students surveyed. The percentage of ownership shown, represents the percentage of students who reported that the devices they had access to were owned by them (Fig. 3).

The overwhelming majority of students surveyed viewed these devices as central to their academic success, with desktops and laptops being rated as the most important of the four devices for the group (Fig. 4). Participants rated laptops as less important than US undergraduate students surveyed (c.f. 94% rated them as either extremely/very important in the US, with 82% in this survey). The smartphone was also seen as valuable for university studies, with some 70% of students reporting it was either

Table 1 Survey respondents (gender and age)

Gender/Age	18–20	21–24	25–30	Total
Female	85 (63%)	135 (71%)	8 (80%)	**228** (68%)
Male	50 (37%)	54 (29%)	2 (20%)	**106** (32%)
Total	**135** (40%)	**189** (56.5%)	**10** (3%)	**334***

*Total is not 344 as some students did not give details of either age or gender

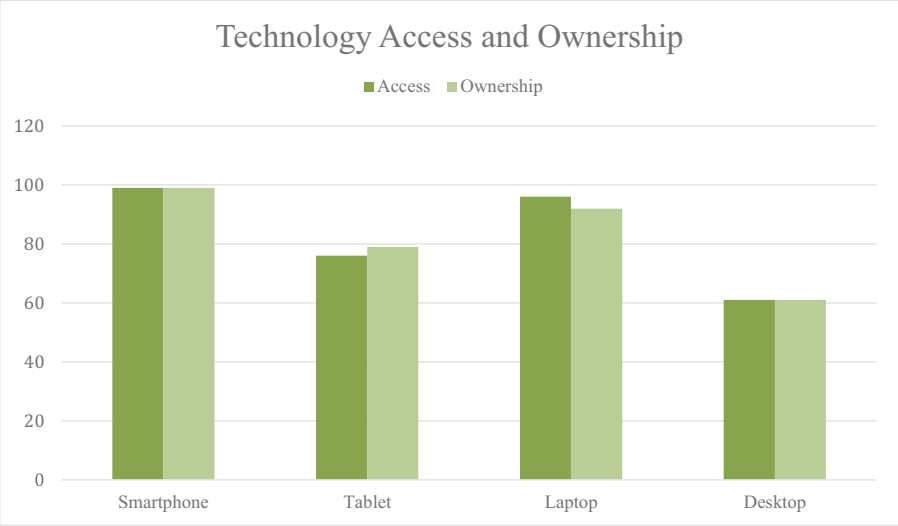

Fig. 3 Students' technology access and ownership

extremely/very important in comparison to 53% of US undergraduates (Fig. 5). These results show a similar preference for mobile phones as a device for learning over laptops and tablets in the Emirate of Ajman, UAE (Shishakly 2019: 73.3% prefer smartphones c.f. 17% laptops). Further analysis shows that students are predominantly using smartphones for administrative purposes such as checking grades and registering for courses. It is of note however that large numbers of students are using them to access their course learning sites and research content in the library.

Turning then to students' ICT skills, the vast majority of students considered all the software applications listed in the ECAR survey as important. The individual subject learning sites delivered through a learning management system (LMS) were recognised as the most valuable ICT tool for university study. This was closely followed by the university's website (96%) which functions as an LMS portal for individual subjects, the university library, message boards with academic staff contact details; and word processing software (96%) used for writing assignments, formatting presentations and analysing data (Fig. 6).

Results indicated that the majority of students (60%) learned best in blended learning environments with some online components. Approximately the same percentage of students felt they learnt best in courses that were completely online (19%) as those that felt they learnt best with no online component (21%).[9] This compares with 55% of US undergraduates who reported they would prefer to learn in a blended environment, 38% on campus and 7% completely online. Around three quarters of students (76%) reported that they felt prepared to use technology for their studies when they commenced their undergraduate degrees, which compares favourably to both undergraduate students in the US (67%) and students in a university bridging course in Australia (55%). Though as Morgan (2018) notes, the students in the latter program

[9] Participants in focus groups also commented favourably on blended learning, citing advantages such as replaying videos, working remotely, catching up on missed classes, etc.

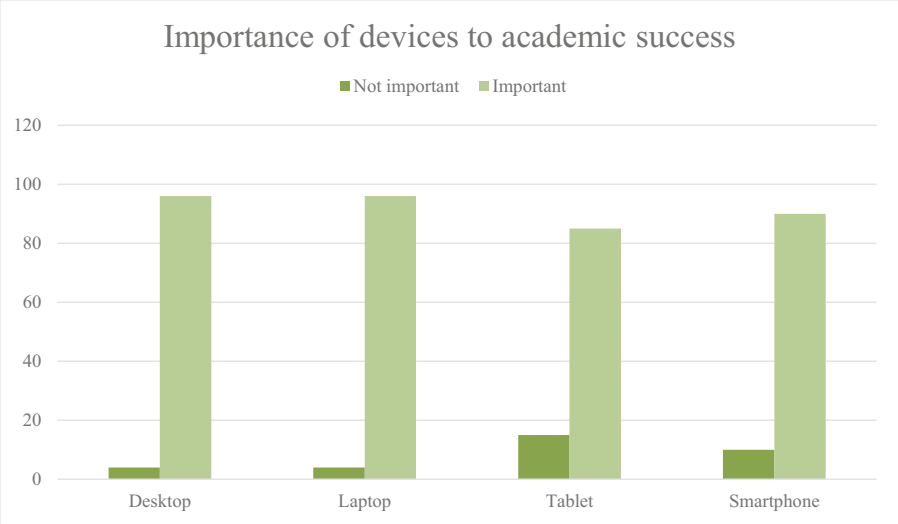

Fig. 4 How important devices are to academic success

were mostly from lower-socio economic backgrounds and with limited recent formal educational experiences.

5.2 Practices and attributes

In Beetham and Sharpe's (2011) model, students' access and ICT skills lay the foundations of the higher-order elements of digital literacy: practices and attributes. In order to better understand these students' digital practices a survey question asked which online resource they felt was the most helpful for finding information in their undergraduate studies. The most common answers in descending order were the course

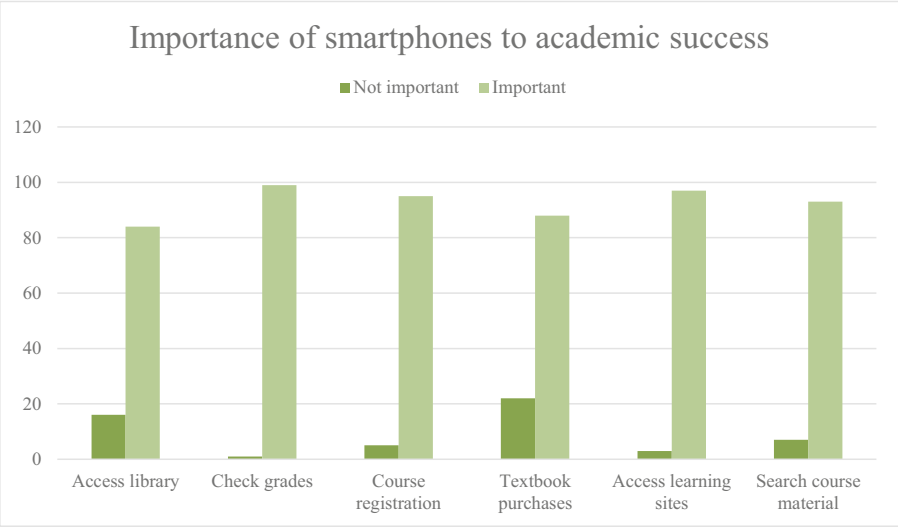

Fig. 5 How important smartphones are to academic success

learning site (Blackboard), not sure/don't know, Google, YouTube, Wikipedia, the university Library, Google Scholar and Chegg.com. An NVivo word frequency query showed that group participants listed Google (21), Blackboard (18), Instagram (15), YouTube (14), Snapchat (5), WhatsApp (5), Twitter (4) and Facebook (3) as the most common tools/apps.

It is of interest here that for sites where students were not directly given resources for use (such as on the course learning page) the second most common response shows they are uncertain about which sites are most relevant to university study. The next three most common responses (Google, YouTube and Wikipedia) are non-academic websites which lack the credibility and authority to be included in university assessment. The University Library and Google Scholar were listed as the 6th and 7th most helpful sites for finding information, both of which however were nominated by less than 5% of respondents. Though it is of note that 96% of students surveyed did consider the University library site as important to their academic success, it appears its importance is viewed as inferior to other non-academic sites such as YouTube. This suggests the students lack an awareness of the digital literacy practices needed for locating authoritative information and evaluating the relevance/credibility of that information (Blakeslee 2004). Data from the focus groups under the 'digital literacy' theme shows students would like further development on "evaluating websites; using credible, authentic sources; identifying false information; getting useful information from the internet, and; using the e-library". This finding is consistent with findings of CALD students in another EMI context in Malaysia (Ganapathy and Kaur 2015), and for students in the US (Nasah et al. 2010).

The focus group results indicated that most students were confident about their knowledge of and ability to access and use digital tools and platforms. Even when they were introduced to new tools, they were not hesitant in trying them out, often developing skills through self-learning. Several references were made to 'self-learning' or 'self-taught' in relation to using previously unknown tools, platforms and

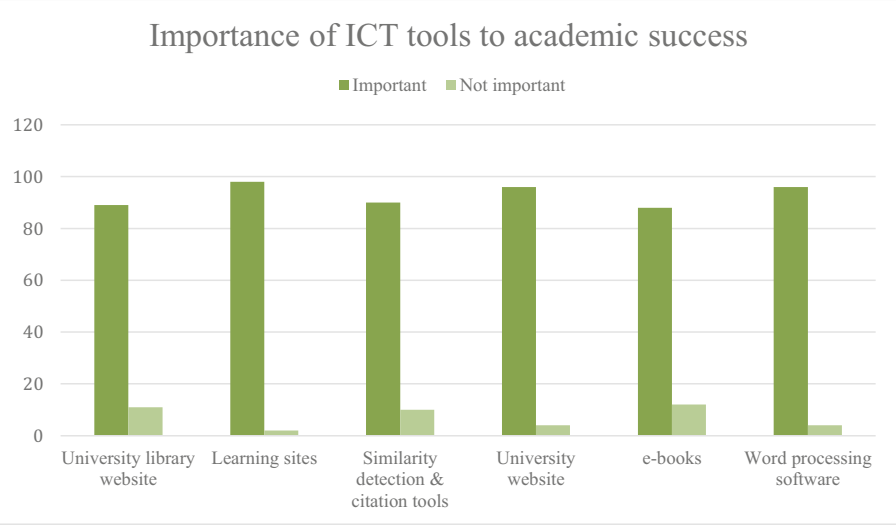

Fig. 6 How important ICT tools are to academic success

applications. Watching video tutorials and collaborative learning with peers were two of the ways mentioned. This resonates with the understanding of younger users engaging with digital technology in a self-assured manner and the ECAR study results that found "students' default modality is DIY" (Brooks and Pomerantz 2017). For the more formal or academic tools, students recognised that instruction from the university was preferential. There was discussion about whether stand-alone courses were more effective in imparting knowledge and enabling digital literacy practices (explicit) or whether such generic skills should be incorporated into the whole curriculum across all courses (implicit). There were mixed responses to this question from group participants depending on their individual experiences and some had learnt several information literacy and technology related skills, such as, using search engines effectively, including Google Scholar, presentation software and availability of library resources. "It should also be encouraged in [all] courses. I mean if the other courses, throughout your college and in your years… [If] they're not really promoting it, you feel like you're not really using the skills. So they [skills] kind of waste away" (curriculum theme). Ultimately, there was no consensus about where digital literacy should fit into the curriculum to ensure students receive appropriate literacy development.

Students made a clear distinction between using technology for social and academic purposes. There was potential for skills transfer between the two but each needed its own specific, defined skillset. Maintaining a certain distinction between the two types of usage was seen as desirable because students did not want their personal, social use to be mixed with study and research. Over 80% of survey respondents either strongly agreed or agreed to 'I like to keep my academic and social life separate'. Social media was seen as having potential to be used for academic or research purposes and the example of Twitter was given as a way to gauge trends or ideas that would enable students to collect information on an initial and informal basis before moving to more academic sources. Having fluency in social media use was seen as an advantage, "for example, [if] someone uses social media a lot, it would be easier for him to learn how to share, because he is used to the technology. But if you bring someone that doesn't know anything about technology, it will be difficult for him to write words or [know] what to do in specific situations" (skills transfer theme). Social media allowed students access to other students - current and past - and this was a very useful way of asking for advice, understanding what research had previously been undertaken and avoiding pitfalls. The use of social media in educational settings has been demonstrated in several studies (see for example, Greenhow and Lewin 2016). Ward (2012, in McCrea) recognised early on that "digital literacy and social media is an inseparable and powerful combination" but warned that for this intersection to have most impact, it needs to be focused and meaningful - not just the use of social media to look 'cool' and appeal to students. One or two group participants cautioned about this by stating that active social media users are not always the best writers or researchers and the assumption of the automatic linkage should not be made.

Interestingly, whilst almost all students stated that they wanted to keep social and educational usage distinct and separate, some suggested that platforms such as Blackboard should be made more like social media to 'appeal' to them and make them more user-friendly. The instant nature of social media was seen as an advantage compared to any LMS and the communicative aspect of social media platforms that were constantly 'on' or 'open' was better than Blackboard for which you needed to

login and navigate before obtaining the required information. The instant nature of many communication platforms has altered expectations of many students and they require the same speed from educational technologies that they have become used to on social media. Instant chats with lecturers were one example that was cited. "I think it [Blackboard] is more complicated and you have to create a group and all that… and it's not instant" (Blackboard theme).

In terms of their digital literacy practices, such as evaluating information found online, the focus group interviews suggested variable capabilities across the group, with an awareness yet limited grasp of how online information could be evaluated. The survey did not systematically measure students' skill levels or competency in using particular technologies. The cohort in this study were all aged between 18 and 25, owned a smartphone (often more than 1), had access to a laptop and used tools and applications that are universally popular. Most were not aware of the phrase or concept of digital literacy but in discussions about the concept[10] many considered themselves as being digitally literate. When considering particular factors such as evaluating websites a few students affirmed their ability to do so, one example being collaborative websites for content gathering, such as Wikipedia. When asked about whether they evaluate information, some students stated that it depended on the website, "when you read newspapers… you see credibility [which] is important" (evaluation and credibility theme). Apart from Wikipedia not being credible, they also mentioned blogs and social media which they felt required source-checking and confirmation of information. In this way they spoke about checking the credibility of sources and the fact that search engines do not necessarily convey 'official' information because people can "write whatever they want". In order to confirm information found on websites generated by a search engine, they would visit official sites such as those of national newspapers. Verification of information sent via messaging services (WhatsApp was the most commonly cited) or other less formal applications was also something they were aware of. Whilst students listed a number of non-academic sources (websites) as being important to their studies, they were at the same time conscious of the notion of credibility. However, from the group discussions, it did not seem that students were utilising a structured method of evaluation, such as the CRAAP test, but were usually applying a more superficial approach to evaluating sources. The higher order practices within the academic literacies framework that enable students to rigorously evaluate information and sources are not being applied comprehensively. Unless this is made an explicit learning outcome, students will not reach the higher level of literacy competency that is required as part of Beetham and Sharpe's (2011) attributes.

During the focus groups, students were asked to list the tools, software, applications and websites they utilised for both social and academic purposes. Some students divided their lists into the following categories: communication; research/academic; information; shopping, and; entertainment (this included watching and playing games). The discussions were similar in all interviews about distinguishing between social and academic usage and students suggested that they would benefit if the university provided formal instruction for the use of academic sites and tools. In this way the participants were implying that digital literacy in the university/studies context needed

[10] They were given the American Library Association (1989) definition after the concept had been introduced and were given an opportunity to explore what digital literacy meant.

development, whereas they were satisfied with their own abilities in using less formal or social ICT tools.

Participants in this research study reflected the general attitude of students at the university in their approach and attitudes towards using digital technology for both social and educational/academic purposes. They were confident and felt no hesitation in engaging with existing and new ICT tools and applications. However, what is important to note is that in all the group interviews, participants mentioned training and guidance from the university would be useful, including specialised workshops. This included what was mentioned above (as part of 'digital literacy') but also academic skills such as "how to summarise; paraphrase; reference; use in-text citations, and; language and presentation". A similar finding emerged in Gravett and Kinchin's (2020) study of undergraduate students in the United Kingdom. This reaffirms the results of Morgan's (2018) study which showed that "learners need support in developing the transferable digital literacies required for success in university learning contexts" and this is particularly salient as students exhibited "highly variable levels of pre-existing technical competencies" (p 45). This explicit, focused skills development is essential in bridging the experience (gap) in dealing with social media tools and the skills required for academic use. Furthermore, initial narratives of the 'digital native' are too simplistic and potentially misleading in analysing the experiences of participants because whilst the majority of students had considerable exposure to online and digital technologies, they often had difficulty in transporting this from a social to an educational context and were less advanced than educators perceived them to be (Littlejohn et al. 2012).

Their self-evaluation or identification as being digitally literate may not fall neatly into a more rigorous definition of the practice but perceptions are important. Coldwell-Neilson (2017) cites a number of studies in which students overestimate their digital skills and when tested, demonstrate that their perceptions outstrip their capabilities. If these perceptions are combined with those of educators and administration, it is clear to see where problems may occur. Both students and those responsible for their skills development and education may assume inherent skills, constant connectivity and a technology-rich environment are all that is needed to create highly skilled, twenty-first century, future-ready graduates but there is always potential for a 'digital mismatch' between expectations and realities to occur (Duncan-Howell 2012).

6 Limitations and future work

The results of the research provide a depth of understanding of these CALD students' digital literacies, but it should be acknowledged that the study has some limitations. The results as presented here are limited by the sample size and dependent on voluntary participation by students. While there are grounds for anticipating that similar results would be found at other EMI universities in other Gulf States, further studies of those contexts are needed to draw any confident conclusions about students in other institutions.

The current study is based on students' self-reported digital literacy abilities, a common approach in the literature (Dahlstrom et al. 2012; EDUCAUSE 2018; Morgan 2018). Given the digital-mismatch or disconnect between students' perceptions

and their abilities found elsewhere (Duncan-Howell 2012), the data could be complemented by either surveying academic staff's views of students' digital literacy abilities or directly assessing students' digital literacy levels and capabilities as defined by researchers (e.g. in Beetham and Sharpe 2011; Roche 2017) and comparing these results with their perceptions. Such a tool to directly assess students' digital literacy levels is yet to be developed.

In order to develop a more comprehensive understanding of the digital literacy of students, faculty could be included in the research. Staff digital capabilities and the institutional approach to digital literacy has not been considered in this paper. If the disconnect that has been identified in other institutions is to be overcome, then a holistic approach is required and a university-wide framework needs to be formulated in which all stakeholders are present and involved.

7 Implications

There is growing awareness that university students require digital literacy capabilities to succeed in their studies and beyond. As Bhatt and MacKenzie (2019) note, institutions often approach digital literacy as something which students have (or do not have), rather than something which students do and can be developed. This paper has shown that an academic literacies informed approach to digital literacy can be used to identify a set of specific capabilities (ICT skills, practices and attributes) that students are lacking which can then be developed to support students achieve their educational aims. Existing research highlights the value of embedding these digital literacy skills, practices and attributes in either subject learning outcomes in first year courses, or as part of supplementary workshops across the curriculum. These approaches have relevance to commencing university students globally, but for reasons argued above, these are of particular relevance for university's offering EMI programs to CALD students in other national contexts.

This research found that for the CALD undergraduates of one national university with EMI programs, its students currently have higher levels of digital technology access and ownership than peers in university programs in Australia and the United States. These CALD students bring many digital strengths which can be capitalised on; they not only have high levels of digital access, they report high levels of confidence in the use of ICT tools and see great value in applying them to their studies. However, the results of this study also highlight that the CALD students in these EMI programs lack an awareness of key academic practices, such as *evaluating* and *appropriately incorporating online resources* in their academic work. Given the great importance of getting these practices right for assessment and therefore ultimately their own academic progress, there appears to be an institutional need to address this apparent digital literacy gap. Participants here had a positive outlook on ICT and social media habits similar to Morgan's study of non-traditional students in Australia (2018), students in the US universities (Nasah et al. 2010) as well as CALD students in an EMI context in Malaysia (Ganapathy and Kaur 2015) which could be developed through explicit instruction in order to support students developing the higher order academic skills at the top of the digital literacies pyramid. Importantly, a number of survey responses stated 'don't know/not sure' when asked

about sources which shows they need further developmental support in terms of the digital literacy practices of accessing information and evaluating that information, even though they are aware that the internet is a key resource. A clear implication is that students need explicit guidance from institutions on what digital capabilities are expected of them, and how they can develop these.

8 Conclusion

The cohort involved in this study has demonstrated that they have access and the functional ICT skills in Beetham and Sharpe's (2011) model as well as having the potential to develop higher level capabilities. Many of them would self-identify as being digitally literate but arguably they have not mastered the higher order practices and attributes that the model describes. However, the university should take advantage of the skills set that students have and enhance these by supporting the skills transfer from social to educational use. 'Latent' abilities and positive attitudes towards technology and digital tools mean students are an ideal target population and Roche (2017) and Bawden (2001) both point to the fact that digital literacies can be enhanced through specially created programs which play a central role in encouraging learners to communicate with learning techniques. Furthermore, for CALD students in EMI programs, engendering the cultural capital and practical know-how that is needed to read and navigate contemporary higher education system - that is institutional literacies (Miller 2015) are another factor that will improve performance and arguably their overall academic experience. Just as English language proficiency varies among commencing students, so too does their experience with ICT tools and therefore their skills and abilities. Instead of assuming that commencing students' levels of digital literacy are adequate, higher education providers should ensure they are assessing and supporting the development of those requisite digital skills, practices and attributes in students' first year of study to ensure academic success in order connect graduates with the demands of the twenty-first century, digitally mediated workplace.

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