Omani Students' Coping Strategies in an English Medium Engineering Programme

Holi Ibrahim Holi Ali
Rustaq College of Education, Oman
Department of English Language & Literature

Abstract
This study explores how Omani engineering students utilised coping strategies whereby they negotiated the challenges inherent in studying through the medium of English (EMI) both the students and their teachers utilised several coping strategies to overcome EMI-related problems and difficulties. A qualitative research design with a semi-structured interview with twelve engineering students as the main method of data generation. The interview data were coded thematically and analysed inductively. Key theories were chosen to inform the study design and help in interpreting and understanding the study data. The study seeks to answer the following question: How did Omani engineering students respond to EMI challenges? The data analysis and interpretation are presented according to the emergent themes and a priori themes. The identification of themes offers insights into understanding Omani students' learning experiences through the medium of English and presenting the participants' stories about their challenges and difficulties in college. These experiences are categorised and presented here based on the themes rather than through ascription to the individuals to which they relate.

Keywords: coping strategies, English medium, EMI challenges, engineering programme, Omani students

1.   Introduction
1.1 The role of English in engineering education in Oman
In Asian and Gulf countries, policymakers responded to an initiative for educational reforms and the internationalisation of higher education by adopting the English medium of instruction despite the challenges it manifested (Nyguen et al., 2016). This motivated the Gulf Cooperation Countries (GCC) to expand their higher education and adopt EMI. EMI is defined as "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (Macaro et al., 2018, p.37).

Higher education (HE) in Oman is undergoing rapid expansion and transformation in the GCC and Oman in particular (Baporikar, 2012). This growth demands good English language education and resources. However, proficiency in English language and mastering its skills have been identified as a major challenge in HE (Al-Shemli, 2009). Public and private higher education institutions (HEIs) in Oman teach their science-based and humanities, majors, in English (Al-Mahrooqi, 2012) and English is playing a vital role in Oman as a tool for the country's integration into the wider world and for the 'Omanisation' process as the government endeavours to replace the expatriate workforce with Omani nationals (Al-Mahrooqi and Tuzlukova, 2010, p.13). Advancements in engineering and technology are of the utmost importance for the 21st century in the globalised world (Tamtam et al., 2010). It has been argued that "engineering graduates require an ever-increasing range of skills to maintain relevance with the global environment of the new millennium. Multi-lingual skills are considered a salient element in the make-up of the new global engineer" (Riemer, 2000, p. 91). Research has shown that there is a significant knowledge gap concerning the requirement for international communication among engineering graduates in the Arab world (Tamtam et al., 2010).

In this global context of a growing tendency for English to be used as a medium of instruction in educational contexts, even when the majority of the population speak a local language (Vu, 2014:2), the English language has been receiving political, economic and legislative support from the Omani government (Al-Issa, 2014). The German Engineering Association (VDI) urges engineering graduates to know foreign languages, cultural awareness and teamwork skills (cited in Schulz, 2008, p.146). Adopting English-medium higher education encourages universities towards internationalization (Phillipson, 2009). Moreover, research findings in EFL/ESL generally, and in the Gulf region, in particular, assumed that learning core subjects through the medium of English will help students to develop their language mastery and proficiency (Holi, 2020; Ekoç, 2020; Jiang et al., 2019; Jiang and Zhang, 2019; Chapple, 2015; Macaro, 2015; Al Mahrooqi and Tuzukova, 2014; Belhiah and Elham, 2014; Shohamy, 2013; Ali, 2013; Becket and Li, 2012; Chang, 2010).

When Omani secondary school graduates join colleges of technology to study on one of the technical courses they are expected to join their specialties on arrival, but because of the adoption of EMI in their target professional programmes and because their English language proficiency is often inadequate, they generally have to join the English foundation programme to improve their abilities in that language (Al-Husseini, 2009). Most of the Omani students entering HEIs are required to sit a placement test, however, students who perform exceptionally well on the placement test (86% or above) qualify to sit for a Level 4 Exit Exam. Upon passing this Exit

Exam, students go directly to the credit programmes, provided that they meet all the other admission criteria for the target specialisation, including the minimum test of English as a foreign language (TOEFL) score. If they fail to pass the Level 4 Exit Exam, students are enrolled in Level 4 and then take the general foundation programme, which contains language skills, basic mathematics, Information Technology (IT), and general learning skills (Carroll, 2009; Al-Mamari, 2011 cited in Baporikar, 2012:15). Additionally, the foundation programme aims to equip the students with the skills required to cope with their specialities and to meet a pre-requisite for the post-foundation programme. Upon the completion of their foundation programme, they need to opt for the post-foundation English for Academic Purposes (EAP) courses which are credit courses that function as an extension to the foundation programme. These EAP courses aim to provide students with report writing, presentation, public speaking and communication skills (http://www.hct.edu.om/centers/english-language-center/programmes-and-courses).

These courses are expected to bridge the gaps between students' existing proficiency and the linguistic demands of their specialisations and EMI challenges. Despite this, many Omani students have been experiencing multiple difficulties in coping with EMI in their academic programmes. This study considers their experiences and perspectives on the use of EMI and their coping strategies in their engineering education better to inform the EAP and EMI provision and pedagogy and to gain a greater understanding of the challenges they face.

2. Theoretical background
2.1 The socio-cultural perspective
This study draws on two main theories which include socio-cultural theory as an overarching framework of reference to help to illuminate, conceptualise and understand engineering students' learning experiences through EMI and their coping strategies in HE in Oman. Other theoretical perspectives, which were also considered to make sense of the data in this study, were associated with classroom translanguaging. Wang (2006) points out that socio-cultural theory draws heavily on the work of Vygotsky (1978), and others such as Lemke (1990), Rogoff (1990) and Wertsch (1991). Vygotsky, (1978) views learning as something which is embedded within social events and which takes place when a learner interacts with people, objects and events in the environment. One of the fundamental concepts within the sociocultural theory is mediation, which refers to the part played by other significant people in the learners' lives, whereby their learning is enhanced by selecting and shaping their learning experiences (Vygotsky, 1978). This concept was used to inform my thinking about engineering students' learning experiences in a particular college, which was the site for my fieldwork. Many people played a significant role in the engineering students' lives including, importantly, EAP teachers, family members, engineering teachers, and the students' classmates in the context in question. Vygotsky (1978) claims that the secret to effective learning lies like the social interaction between two or more people who possess different levels of skill and expertise. Therefore, mediation and collaboration are of vital importance in knowledge acquisition and appropriation through interaction. In the context of the present study, the world that socio-cultural theories refer to is the academic world, and the culture involved refers to the academic culture in which this study was conducted. Specifically, that is learning engineering through English as experienced by a group of students in a particular college in Oman. Fieldwork revealed that engineering students in the present study used their first language (L1) in some situations in their classrooms as a means to mediate their learning and as a strategy to cope with

their EMI challenges and difficulties. Socio-cultural perspectives on learning conceptualise learning as a social act and language are considered as the fundamental tool mediating knowledge acquisition and development. Issues related to interaction, collaboration and peer support that enable learners to be engaged in their learning are central to this study.

2.1 Translanguaging perspectives on learning

The learning experience is one of the main factors that influence students to study engineering in addition to the choice of careers in engineering after graduation (Balakrishnan and Low, 2016). Emergent bilingual students face the challenge of developing their disciplinary knowledge and this can be particularly challenging in content areas such as science (Esquinca, 2014). There are two main types of classroom translanguaging: student-directed and teacher-directed. They both have pedagogical value in the bilingual classroom, and they are used for scaffolding and enabling learning and promoting dialogic teaching (Melo-Pfeifer, 2015). Therefore, exploring Omani engineering students' learning experiences through the medium of English is of vital importance for informing EMI pedagogy in general and the EAP in particular. One aspect of the Omani engineering learning experience is the students' use of L1 and translanguaging to cope with their English-medium engineering programmes and to communicate with their classmates. Translanguaging is increasingly used within the academic community as a medium of communication and as an approach to the teaching of science-related courses in the field of bilingual education (García, 2009). It is defined by Canagrajah (2011) as "the ability of multi-lingual speakers to shuttle between languages, treating diverse languages that form their repertoire as an integrated system" (p. 401). Moreover, it refers to the interrelated discursive practices and "forms of hybrid language use that are systematically engaged in sense-making" (García et al., 2011. p.5). However, it has moved away from the traditional terms code-switching, code-mixing, code-meshing, borrowing, etc. Translanguaging can facilitate communication and interaction among students and their teachers, and it can also help students to express their ideas. In this regard, as García and Leiva state (2013):

> The concept of translanguaging goes beyond code-switching. Code-switching refers to the mixing or switching of two static language codes. Translanguaging, resting on the concept of transculturation, is about new languaging reality, original and independent from any of the 'parents' or codes, a new way of being, acting languaging in a different social, cultural and political context. Translanguaging brings into the open discursive exchanges among people in ways to recognize their values of languaging. In allowing fluid discourses to flow, translanguaging has the potential to give voice to new social realities (p. 216).

Researchers have claimed that translanguaging opens the door for new understandings of the bilingual classroom and learning in general (Mazak and Herbas-Donoso, 2015). Translanguaging is different from code-switching and code-mixing. In this regard, García and Sylvan (2011) explain:

> Translanguaging includes code-switching – defined as the shift between two languages in context – and it also includes translation, but it differs from both of these simple practices in that it refers to the process in which bilingual students [and we would add,

teachers] make sense and perform bilingually in the myriad ways of the classroom – reading, writing, taking notes, discussing, signing and so on (p.389).

According to García and Kleifen (2010) and Esquinca et al. (2014), translanguaging mediates learning for bilingual learners and includes practices such as shifting between text in one language and discussion in another language, discussing in one language but checking comprehension in another language and using both languages flexibly. It has potential pedagogical implications (Gort, 2015). As mentioned above, the Omani engineering students who participated in this study were using both English and their L1 (Arabic) during their engineering lectures to communicate and help each other to understand concepts and instructions. Translanguaging practices could become mediational tools to create and expand zones and opportunities for learning (Martin-Beltran, 2014). Additionally, it seeks to promote pedagogical practices that consider bilingualism as a positive resource rather than as a problem (Lasagabaster & García, 2014). It goes beyond the traditional concept of bilingualism as it seeks to include the minority language and its community whilst ensuring that it and the language of instruction is not seen as competing. It claims that bilingual speakers have a unique repertoire which they can use strategically to facilitate effective communication (Lasagabaster & García 2014). Translanguaging is not just about mobilising one language to reinforce the acquisition process of another, or to enhance the understanding of unknown structures or words by relying on familiar ones. It is crucially about employing multiple semiotic resources to create meaning and to give meaning to the learning and teaching process. It has the potential to empower the critical voice and consciousness of the learner and to impact classroom participation positively (Melo-Pfeifer, 2015). It can help learners to figure out the meaning of a particular vocabulary item or scientific concept (Sayer, 2013). Moreover, Baker (2006) suggests potential educational and pedagogical advantages of translanguaging, namely, it may promote a deeper understanding of the subject matter; it may help in developing the language, and it may help to bridge and create cooperation between home and school. Further, Lewis et al. (2012) claim that translanguaging promotes biliteracy.

The present study draws on the theoretical perspective on translanguaging due to its pedagogical value for developing teachers' and learners' awareness to the importance of students' L1 as a mediating tool which fosters learning and the teaching process (Langman, 2014). Wahi (2013) conducted a study on English as a second language (ESL) engineering English language academic literacies in Malaysia and he noted that in the process of struggling to understand the course materials and unfamiliar subjects, students adopted translation strategies and other strategies, such as relying heavily on dictionaries, to aid comprehension and construct their utterances and compositions. Students acknowledged the fact that they were thinking cognitively in their mother tongue and subsequently translated their ideas into English to meet their academic requirements (Wahi, 2013). The study suggests that learning English language literacy is a complex and highly contextualised process, particularly in the multi-lingual context of Malaysian engineering education (Wahi, 2013).

It could be argued that EFL/ESL higher education institutions need to accept the need to adopt a policy that accommodates L1 use, particularly among learners with a low level of English as a second language (L2) proficiency. This could ease the transition for the students into tertiary education, which requires them to adapt to a very different culture of learning to their previous

Arabic-medium schooling (Mouhanna, 2010). A study conducted by Kim, Kweon and Kim (2016), investigated Korean engineering students' perception of EMI and L1 use in three major engineering universities. Their results make compelling arguments against EMI while demonstrating students' invariable support for LI use in the EMI classroom. Most of the students did not select EMI classes voluntarily. They showed low confidence in their English ability and consequently did not feel that their English skills were sufficient for EMI classes. Additionally, many students were not convinced that EMI classes helped them to improve their English skills. The study suggested that students' and their teachers' involvement in EMI must not be compulsory as their English might be inadequate for EMI classes. Furthermore, the benefits of L1 use in EMI classes need to be recognised by instructors, students and administrators. They argued that from second language acquisition, L1 use has been considered detrimental to learners' acquisition of L1, limiting their exposure to L2. However, numerous studies have shown that L1 can function as an effective academic tool for clarification, emphasis and repetition of valuable content, as it may help to strengthen the rapport between students and their instructor, which is a key strategy for classroom management. They argued that the use of Korean in EMI engineering classes would accelerate students' comprehension of complex materials. They claimed that L1 use in a bilingual and multi-lingual situation is a natural phenomenon and must be recognised and utilised as a legitimate, effective instructional strategy (Kim, Kweon & Kim, 2016). L1 use in EMI classes has always been fraught with controversy; however, both L1 and L2 can provide important communicative support for both students and teachers (Lasagabaster, 2013). Moreover, Auerbach (1993) claimed that L1 use in the classroom offers a sense of security and validates the learners' lived experiences, allowing them to express themselves clearly. Macaro (2009) states that the use of L1 in teaching has been challenged by research findings. Firstly, because it has been observed that the vast majority of teachers use L1 to varying degrees, even in those contexts where an only-L2 language policy is expected to be implemented; secondly, because the L1 can function as a cognitive tool in L2 learning and teachers can facilitate learning by making reasoned references to the L1; and thirdly, because code-switching is a natural part of bilingual interaction. So, the use of LI in EMI classes can tackle many disciplinary issues (Lasagabaster, 2013).

Despite research findings that demonstrate that teachers make ample use of the L1 (Littlewood & Yu, 2011), practices such as code-switching and translanguaging are still controversial. The use of L1 EMI and Content and Language Integrated Learning (CLIL), if judicious, can serve to scaffold language and content learning in EFL/ESL contexts, as long as learning is maintained primarily through the L2 (Lasagabaster, 2013). Teachers need to be able to appropriately interpret bilingual phenomena and use students' L1 as a resource for learning in their classes (De Jong and Harper, 2015).

3. Methods

A qualitative research design which was underpinned by a case study approach was employed in this study to offer the opportunity to study people in their natural settings and to make sense of and "interpret the phenomena in terms of meaning people bring to them" (Denzin and Lincoln, 2008, p.4). Drawing on the interpretivist qualitative paradigm, the study adopts an explorative descriptive case study that focuses on the experiences of a group of Omani students and their accommodation strategies they used to handle EMI challenges. Semi-structured interview with twelve engineering students from a college of technology was used as the main methods of data

generation. Semi-structured interviews are considered as one of the most powerful ways we have of understanding others" (Kvale & Brinkmann, 2009, p.168). The interview data was coded thematically and analysed inductively. The study attempt to address the following fundamental question: What were the coping strategies used to handle those challenges? A qualitative methodology was utilised to help developing understandings of participants' experiences and views in detail and depth. Purposive sampling entails studying information-rich cases and yields insights and in-depth understanding rather than empirical generalisations (Patton, 2002, 230). Therefore, this study utilises a purposive sampling procedure usually used with a multiple structure population of many groups. All these measures were applied with regards to the interviews. The cooperation of participants was requested, their voluntary participation was obtained, and they were informed of their right to withdraw at any time should they so wish. All participants were provided with a voluntary consent form, which included the purpose, and nature of the study, outlining ethical procedures that protected their identities and guaranteed their anonymity and privacy. Informed consent includes the purpose of the study, who the information is for, how it would be used, what would be asked in the interview, how the information would be handled and what benefits were involved for participants being interviewed (Patton, 2002). The analysis was undertaken through the identification of the main themes and codes which offered a thorough and in-depth understanding of the issue under investigation.

4. Findings
4.1 Omani engineering students' EMI coping strategies

The Omani engineering students participating in this study utilised several coping strategies to handle their EMI language-related challenges and difficulties. The issue of coping strategies appeared as a recurrent theme in both the interviews and observational data analysis. Some of these strategies seemed to be more effective and widely used than others. This section presents Omani students' coping strategies which are divided into the use of mother tongue as a compensatory strategy; use of translation dictionaries and technology; in-class task-related strategies; the use of social support from peers, groups and family members; use of personal strategies and lecture comprehension-related coping strategies.

4.2 Using the mother tongue (Arabic) as a compensatory strategy
Students frequently used Arabic, their mother tongue, as a compensatory strategy to avoid communication problems and breakdowns when they asked and answered questions. Some of the students referred explicitly to their use of Arabic or translanguaging, in their engineering classes. This was also noticed during observations where students were interacting and discussing questions with their classmates in Arabic.
 S3 thought that Arabic was useful for his study:

> To some extent, Arabic has helped me. If I haven't understood anything or a point, I can ask my friend to explain to me in Arabic. If I were asked to study engineering in English or Arabic, I would go for English because if I study in Arabic, I wouldn't find a job to secure my future. Some engineering professors are Arabic speakers who can simplify things and say them in Arabic and we have found that much more useful and beneficial for us. Some of my friends use Arabic to explain the new

instructions and machines' manuals to us. Friends use Arabic to write their assignments and then translate them into English using translation technology (S3).

S3 realised that the Arabic-speaking engineering professors were using Arabic to mediate learning and to explain things which the students could not understand in English. In cases like this, translanguaging can promote a deeper understanding of the subject matter (Baker, 2006). In addition to using Arabic as a useful coping strategy, students also relied on peer support as another coping strategy. Using Google Translate was yet another coping strategy whereby the students translated English engineering texts which were required for their assignments and projects into Arabic.

Other engineering students identified holding the same view of additional roles of Arabic in their engineering classes as a compensatory coping strategy:

> It has several roles to play in the classroom and outside. People learn better when they are instructed in their mother tongue and several countries, such as Japan and China, have been using their local languages as medium of instructions. They have been developing in education, technology, industry, etc. Arabic should be used even as an auxiliary language besides English to help students to understand the content. I usually use Arabic along with English to discuss content with my classmates and argue with them. On some occasions, we mix Arabic and English when we study in groups. We use Arabic when we study for our exams and write our assignments and projects. Sometimes we write everything in Arabic and then we use machine translation to translate it into English. Arabic was beneficial for us (S4).

Translanguaging interactions were plain to see and regularly evident during classroom observations as a student carried out their engineering-related tasks. Another of the interviewee stated:

> My mother tongue has played many positive roles such as in mathematical calculations. Moreover, some teachers use Arabic to explain difficult concepts and problems which relate to engineering. We use Arabic with each other to discuss problems and how to solve them. We use Arabic to give examples from real life to explain stuff and relate them to our everyday life (S5).

Another student highlighted the wide use of Arabic among students both on campus and in their hostels and its role in engineering education:

> Arabic is widely spoken across the campus and in the hostel as well. We use Arabic to discuss technical things in some cases instead of English because it is our mother tongue and it helps us sometimes to comprehend abstract things and concepts in a better way. We sometimes translate the whole handout to understand it in a better way. Arabic-speaking teachers are more likely to digress to Arabic to explain complicated things to us. Moreover, they give examples from reality to explain or demonstrate ideas for us. The equivalent of certain technical words is given in Arabic and then just remembered as we studied it during our school days. Arabic

has helped us in studying not only engineering but also studying the English language as well (S7).

Some of the students showed that they had thought about EMI and its role and necessity. On the other hand, some were against EMI. They repeatedly stressed the importance of studying engineering through the medium of their mother tongue (Arabic).

> I think engineering should be taught in Arabic and there should be an English course taught along with the degree to help to communicate with companies (S6).

One of the students interviewed, however, favoured the opposite view with regards to the use of Arabic in engineering classes:

> I am against the idea of using Arabic as a medium of instruction for several reasons: first, if you work for big companies then you will be sent for courses and training abroad, so how would you cope with courses because they will be run in English... Second, the vast majority of engineering textbooks, references and machine manuals are in English. Third, high proficiency in English is one of the requirements in joining big companies in Oman such as Petroleum Development Oman (PDO), Occidental Petroleum (OXY), Schlumberger, etc. I did not use Arabic to cope with engineering difficulties though. I sometimes find it difficult to understand some of the exam questions. I try to read the questions several times and sometimes I asked the teachers about some of the keywords in the exams (S1).

S1 and a quarter of the participants illustrated the stance against the use of Arabic as a medium of instruction in engineering education in Oman.

The above cases demonstrate the importance and significance of the students' mother tongue, Arabic, in their engineering study. It is not always possible for students to use only English to study or to cope with their engineering tasks and this can give rise to a range of conflicting perspectives as well as, perhaps, some inner conflicts. However, the majority of the participants interviewed, 7 out of 12, were firmly in favour of studying through English; 4 out of 12 were committed to it, and 2 were ambivalent.

4.3 Using translation, dictionaries and the internet

The Omani engineering students participating in this study utilised a variety of coping strategies during their engineering course. These strategies were shaped by the type of task and activities required by the engineering classes. However, they reported that they used Arabic translation, bilingual dictionaries and websites to cope with EMI-related challenges and difficulties. One student pointed out:

> Arabic has helped us in knowing difficult concepts and terms. I usually used research engines and Google translators to find out meanings of new terms and concepts. Some teachers use Arabic to help us to write such assignments and they

translate them into English using technology. Lack of exposure to terms was a problem for us but Arabic has helped us a lot to know new terms and concepts. Sometimes the content is easy but the language used is very difficult so Arabic could help us complete assignments without clear guidelines and rubrics, and we use it concerning that issue. However, the translation process of the technical terms and concepts is time-consuming. We chat together with our classmates in Arabic to discuss things related to lectures before we go to the classroom or ask questions to our teachers and professors (S8).

The interview extracts above further highlights the role of the mother tongue (Arabic) as one of the most prominent coping strategies used by students to handle their EMI challenges and difficulties. Points such as those made here were frequently repeated and make clear that recourse to Arabic was made within a range of contexts to clarify thinking. Teachers were aware of this, and Arabic-speaking tutors were particularly valued because of their capacity to directly engage with their students in their mother tongue.

The use of Arabic was a prominent coping strategy used by students to handle their EMI-related challenges and difficulties. Students stated that they frequently used Google Translate for finding out meanings and writing their assignments and projects. Additionally, Arabic helped them to discuss and revise concepts and technical terms with colleagues before their classes. Moreover, they used Arabic in some cases to ask questions and seek clarification from their Arabic-speaking professors.

S6 stated that:

Yes, our mother tongue was a great help for us in translation and interpreting technical terms and concepts. I use dictionaries to help me translate technical words into Arabic. Most of our engineering studies and courses related to physics and therefore I had to know all the physics-related terms in Arabic. The teacher was an Arabic speaker and I used to understand and comprehend 97% of the lectures (S6).

S10's interview revealed that bilingual dictionaries were a great help for them:

For technical terms, I used to seek help from my father, consult [bilingual] dictionaries and use technology to find out about their meanings and pronunciations. They have been helpful to me. Some of friends and classmates have been helpful in group discussions and presentations (S10).

An engineering teacher confirmed that students sometimes used their mobile dictionaries to find out meanings of technical words and concepts during their classes:

Sometimes you would be surprised that they don't know the very basic words, which I think they should have. I just don't know what the structure of their high school curriculum is. It should have been discussed way, way back. When students

encounter one word that's not familiar to them they just did they take their phone, punch the word in and know what the meaning of that word is (Eng. T4).

Bilingual mobile dictionaries seem to have been frequently used as a compensatory strategy to help students cope with their discipline-specific terms and concepts. Both the participating students and the teachers were aware of the importance of using bilingual dictionaries in their engineering studies.

4.4 Usage of peer, group and family support

Students spoke about their use of peer, group and family support as significant coping strategies in their engineering studies. This was indicated by one of the interviewees:

> I sometimes seek help from teachers and friends. Moreover, family members who are educated can help in this regard. I talk to my friends in Arabic and they explain everything in Arabic and this has been helpful for me. Going to a teacher during office hours and asking them to repeat what they have taught is another useful coping strategy (S8).

This social support was considered as an effective coping strategy for this particular student, though not all would have similar cultural capital within their family network. Observational data revealed that students were utilising various cooperative learning methods to help and support each other in their engineering classes.

One student stated:
> I usually seek help from my elder brother who is an engineer. Additionally, my friends and classmates help me to understand things which are not clear enough for me. I sometimes ask my teachers for further help and explanation (S5).

He had access to friends and family members who were able to help him with assignments and projects. He considered this support network an effective way to cope with his study. Other students stated:

> As for assignments, I usually seek help from friends and teachers, and they have been helpful for me. My brother is a civil engineer and he sometimes helps me with my projects and assignments (S3).
> I used to go to my uncle to chat with him in English and he has been helping me with my English and assignments too. I believe that nothing is easy in life and there is no gain without pain (S6).
> It hasn't been easy for me to overcome such challenges, as some of these were there since my schooling. My friends were a great help to me in terms of explaining difficult things for me in Arabic and simplifying equations in English. Some of them were helping me with projects and lab reports. We sometimes organise group reading and discussions and they have been helpful for me to overcome such problems. Translation technology was a great source of help for me in some cases (S7).

In some cases, students resorted to hiring an English tutor to improve their English to cope with their EMI-related challenges. The help of family members is usually referred to as 'mediation' in Vygotsky's terms, one of the fundamental concepts in sociocultural theory. It highlights the role played by other significant people in the learners' lives. Mediation and collaboration are of vital importance in the process, whereby knowledge is acquired and appropriated through interaction. In short, the data reveals that students utilised various cooperative learning paths, many informal and outside the institutional sphere, to help and support themselves and each other in their engineering studies.

4.5 Opting for English tuition classes

One of the coping strategies employed by students, in addition to hiring a personal tutor, was that of attending English tuition classes.

Some students participating in this study had been involved in English courses for nine years, including full-time language instruction (not less than 15 hours a week) for one and a half years in the foundation programme. In other cases, the language deficiencies may have been made worse by ineffective instruction, inadequate curricula, demotivated or ill-prepared teachers and a scarcity of real-life and 'push-and-pull' factors to use correct English, etc. However, to assess the incidence of these variables would require further research into factors such as Intelligence Quotient (IQ), college preparedness, motivation, socio-economic background, policies, college infrastructure and facilities, funding, personal study habits, recruitment criteria, assessment methods and curriculum design. What may well be asserted is that some of the students encountered many language-related difficulties in their engineering study and sought help from their relatives, friends, teachers on campus, private tutors and each other. Indirectly, this indicates that their college English classes were not enough (objectively and subjectively) to help them to develop the kind of English which is needed to successfully study engineering courses in English. English tuition classes are quite common in Oman at all educational levels, however, not all students can afford them – which both creates and perpetuates educational inequality. Consequently, many students felt the need to access private tuition classes during their free time to improve their English to meet their study needs. Such students did not feel able to rely on their college English classes alone. These classes are not affordable for all students; however, some of them had the necessary financial capabilities.

Having discussed tuition classes as a coping strategy, the analysis will now move on to look at the personal coping strategies which the participants considered to be important, necessary and effective for dealing with their EMI challenges and difficulties.

4.6 Using personal coping strategies

The issue of the use of personal coping strategies emerged from the analysis and the data set as a salient and recurrent theme. All students emphasised the importance of their strategies in helping them to cope with their EMI-related problems and difficulties.

S6, a student, pointed out:

> One of the most effective coping strategies which I have been using is my effort. I usually write a list of words and I keep repeating them all day until I internalise them (S6).

This quote illustrates that some students develop their coping strategies which, incidentally, is a natural and necessary dimension of becoming an autonomous learner. In this case, the strategy meant glossaries and repeating words, concepts and terms throughout the day. Engineering students do not complete their secondary schooling knowing detailed engineering jargon. However, in the case of Omani students, the enculturation process must happen in a foreign language. And it is more difficult for Arabic-speaking Omani students to deduce the meaning of technical words, many of which are often etymologically linked to two other completely unknown languages, namely Greek and Latin.

In the same vein, a student reported:

> We usually use many strategies to cope with such language difficulties. I do some reading and revision of the materials given before my class. We asked senior students to help us. I approach other teachers to help me understand the point. I used Google translator to translate the texts or instructions into Arabic and then I can understand them in a better way (S8).

The fact that some of the students are doing this shows that they are (gradually) taking charge of their learning.

Another student who used personal coping strategies to handle his EMI language-related difficulties stated:

> For technical terms, I used to seek help from my father, consult dictionaries and use technology to find out about their meanings and pronunciations. They have been helpful to me. Some friends and classmates have been helpful in group discussions and presentations (S10).

S8, a student, added:

> I used many strategies to overcome my writing problems. I kept writing many drafts and submit them to my teachers to get feedback. After that, I rewrite the draft and now I feel my writing is far better than before. I sometimes feel that I don't have enough ideas while writing and I think that academic writing is boring and difficult. I find it difficult to construct a sound argument which can be supported by evidence and examples. Moreover, I feel writing is time-consuming. During exams, I write a lot to express myself clearly for simple things which could be expressed in simple sentences. Seeking help from friends and classmates has been a common strategy. I think the 'over-writing' [writing at length, including several drafts] strategy has been the most effective strategy which has helped me to deal with writing problems. Repetition has been an effective strategy to help us to deal with my writing problems (S8).

The above interview extract illustrates yet another coping strategy which is a study that students normally develop on their own. S8 was in the habit of writing drafts and submitting them to his teachers and then reflecting upon their feedback. In this way, the student seeking to improve his writing. He did this even though he found academic writing difficult, boring and time-consuming. For exams, he would over-write a simple thing and use simple sentences to make his arguments

clear. It seems that writing essays over and over again worked for him, too. This suggests that rewriting is important for mastering writing, and students could learn (and be encouraged) to write effectively by rewriting good and useful texts.

S9 also revealed that he combined two of the above-mentioned strategies: rewriting and making glossaries:

> For my writing, I am working hard on it by rewriting and getting comments and feedback from my teachers but the spelling problem is still there. For technical terms and vocabulary, I developed my own technical terms glossary and it has been helpful for me (S9).

To sum up, the students' responses demonstrated that Omani EMI engineering students use a variety of personal strategies to overcome their EMI-related problems. They use these strategies to manage their challenges and cope with their study needs and requirements. Although their collaboration and interaction with their classmates, teachers and family members in a shared practice were significant for their learning, they still developed their coping strategies to handle their EMI language-related difficulties. This suggests that it was not enough for them to depend on others to help with their study difficulties; they also needed to proactively and creatively develop personal coping that worked for them.

5.   Discussion
5.1 Omani engineering students' coping strategies
My data shows that engineering students developed their mainly own intuitive/informal coping mechanisms to help themselves study in English. For example, they frequently resorted to their mother tongue (Arabic) as a compensatory strategy, used online translation applications and bilingual dictionaries, sought the support of their peers, group and families, and hired English tutors. At the metacognitive level, they also developed their strategies and applied lecture comprehension strategies.

Something that repeatedly emerged during the interviews was that the students (and occasionally also the teachers) continuously switched between English and Arabic, especially when explanations were needed and certainty was paramount. However, Wilkinson (2005) found that EMI can lead to ineffective content learning if the instructional technique of code-switching between L1 and L2 is adopted.

The findings of the present study seem to be consistent with other findings related to coping strategies used by EFL/ESL students (e.g. Holi, 2020; Al Zumor, 2019; Tsai, & Tsou, 2015; King, 2014; Joe and Lee, 2013; Marie, 2013; Suliman and Tadros, 2011; Alginahi et al., 2009; Saat and Othman, 2010; Hung, 2009; Peacock, 2001; Spack, 1997; Flowerdew and Miller, 1992). Students tend to use similar coping strategies whenever they have to study in English as a foreign language. For instance, Marie (2013) found this when examining the coping strategies of multi-lingual students in Rwanda who were studying in English. One of their most common strategies was translanguaging, i.e. the use of other languages at their disposal to handle their academic tasks. In the Omani case, a telling example of translanguaging was given by S11.

> When sometimes we have group discussion or reading we use Arabic to exchange information and aid understanding and comprehension. Some concepts were really difficult to be understood in English, therefore, my friends explained them in Arabic and we were able to understand them quickly and in a better way. Arabic translation was useful in assignment writing and when practising exams (S11).

S11 exemplified the extent to which L1 was used by students in their engineering classes. Students were supporting each other through the medium of Arabic even though the lectures were delivered in English. This implicitly suggests that translanguaging could be used in some cases to scaffold learning as it can help learners to figure out the meaning of a particular vocabulary item or scientific concept (Sayer, 2013). L1 need not be completely excluded from college. On the contrary, its use in EMI classes ought to be recognised by instructors, students and administrators. Second language teaching practitioners have often believed that L1 use is always detrimental to learners' acquisition of L2 as it presumably limits their exposure to the target language. However, numerous studies have shown that L1 can function as an effective academic tool for clarification and emphasis, and to summarise and repeat important content. It can also help to strengthen the rapport between students and their instructors – which is a vital strategy for classroom management. The use of LI in EMI classes can even help with many disciplinary issues (Lasagabaster, 2013).

The findings of this study showed that teachers adopted some other (besides the use of L1) coping strategies to deal with the challenges presented by EMI. For example, they simplified materials, code-switched, repeated their exposés and re-emphasised key points. These findings are consistent with Saat and Othman (2010), who studied Malaysian students' EMI coping strategies in an undergraduate programme. Their findings are consistent with those of the present study. S11 stated that:

> I often asked teachers to repeat the taught points and concepts several times and to simplify the content and materials. Moreover, I seek help from my father's electricians and mechanics [the father was an employer]. They explain things practically for me. In lab sessions, I sometimes ask my friends to explain things for me in Arabic. For my writing, my sister was a great help. She sometimes helps me with my reading tasks by explaining the main ideas of texts. I used the internet and online dictionaries to know the meaning of technical terms and I sometimes ask friends to help me with the meaning of unknown technical words (S11).

The study at hand, focusing on the engineering discipline in Oman, corroborated what previous EMI studies conducted in the other disciplines in other parts of the world have indicated, that is that EFL/ESL students tend to employ a range of coping strategies to deal with English-medium lectures. For instance, Evans & Morrison (2011) reported that Hong Kong University students were able to study in English by developing learning strategies, relying on peer support and working hard. King (2014), too, found that both EFL students and teachers in the United Arab Emirates (UAE) used several strategies in English-medium programmes, including avoidance, simplification of materials, reduction of content and code-switching into Arabic. Additionally, Flowerdew and Miller (1992), as well as Airey and Linder (2006), showed that the most salient

coping strategies used by EFL students were asking questions after lectures, reading the sections related to the lecture before class, asking for the help of peers or lecturers, attempting to concentrate harder and note-taking. In short, it transpired from the literature and my findings that EFL/ESL students in different disciplinary and geographical/cultural contents tend to use similar coping strategies to deal with the challenges posed by English-medium higher education programmes.

6.   Conclusions, implications and recommendations

Omani engineering students participating in this study revealed that they adopted several coping strategies to deal with EMI language-related challenges and difficulties. The key coping strategies used were the use of their mother tongue (Arabic) as a compensatory strategy; using translation, bilingual dictionaries and the internet; usage of peer, group and family support; opting for English tuition classes; using personal strategies, and some other lecture comprehension-related strategies. Some of these strategies were used more than others. For example, the use of the mother tongue (Arabic) as a compensatory strategy was the most widely used coping strategy. This acknowledged the role of mother tongue on learning content subjects when delivered in English. Therefore, it could be argued that the use of mother tongue (L1) in content classes is not always problematic; it could be used to help students understand some of their content courses which they could not fully understand in English. Additionally, mother tongue (Arabic) was used by students to help each other during lectures and this was noticed during classroom observations. The translation was also another widely used coping strategy used by students to overcome their EMI challenges and difficulties.

Students reported that they used technology-driven translation machines to translate their assignments, engineering textbooks and materials to have a good understanding of them and make sense of them. These machine translation tools were perceived by students to be effective in helping them to translate the engineering content written in English into Arabic. It was evident that translation was creating opportunities for learning within content courses. However, teachers believed that these translation tools were not effective and that they mistranslate concepts in some cases, which might mislead students and impede their comprehension and understanding of those concepts and ideas. In the literature, it is evident that translation is one of the widely adopted coping strategies used by EFL/ESL students to handle their EMI-related challenges and difficulties (Querol-Julián & Camiciottoli, 2019; Sayer, 2013; Lasagabaster, 2013; Marie, 2013; Saat and Othman, 2010). This study suggests that mother-tongue had a positive impact on studying engineering through the medium of English and these students recognised its importance and significance in helping them to study engineering. It scaffolded students' learning, particularly those with low language ability and proficiency levels. In considering whether it is appropriate for students to use their mother tongue in content classes, Langman (2014) argued that the reason for using L1 (translanguaging) is its pedagogical value for developing teachers' and learners' awareness and its importance as a mediating tool which fosters learning and the teaching process. It could be argued that EFL/ESL higher education institutions need to accept the need to adopt a policy which accommodates L1 use, particularly among learners with a low level of L2 proficiency. This could ease the transition for the students into tertiary education, which requires them to adapt to a very different culture of learning to that experienced within their previous Arabic-medium schooling (Mouhanna, 2010).

Evidence also indicated that students used their group and family support as a coping strategy. They sometimes sought help from friends and family members in dealing with EMI and engineering-related challenges. This social support, which Vygotsky (1978) called 'mediation', is one of the fundamental concepts within the socio-cultural theory, which refers to the part played by other significant people in the learners' lives, whereby their learning is enhanced by selecting and shaping their learning experiences. The cooperation within groups and help from family helped Omani students to learn, to complete their assignments and to effectively address their engineering tasks. Additionally, Omani engineering students used L1 in some situations in their classrooms as a means to mediate their learning and as a strategy to cope with their EMI challenges and difficulties. Moreover, students employed a range of personal strategies in addition to including opting to pay for English tuition classes to overcome the challenges presented by studying through the medium of English. These were the key strategies employed by Omani engineering students to minimise their EMI-related challenges and carry out their engineering tasks and activities successfully.

The study also provides an insight into students' coping strategies, revealing unexpected strategies used to handle their EMI-related challenges, such as L1 was being utilised by EFL/ESL students to cope with their English-medium programmes. Moreover, the study shows that there is clear evidence that EMI in practice operates in a complex web of informal language switching. The study makes another essential methodological contribution. It provides a crucial contribution with regards to qualitative methodology in this context as most of the studies, which were carried out in this particular context, were survey-based studies. The study contributes to EMI research as most studies conducted in this area were from critical perspectives. Those studies were focused on problematising EMI and its use and implementation in EFL/ESL contexts.

About the Author:
Holi Ibrahim Holi Ali is Assistant Professor of Applied at the Department of English Language & Literature, Rustaq College of Education, Oman. He has a PhD in applied linguistics from the University of Huddersfield, UK. His teaching and research interests include writing for publication, English Medium of Instruction (EMI), academic integrity in higher education. He has presented widely at international conferences and published extensively in peer-reviewed journals. ORCID ID: https://orcid.org/0000-0002-0608-6146

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