Lecture comprehension difficulties experienced by Omani students in an English-medium engineering programme

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Abstract: This paper considers the views and perceptions of Omani engineering students in relation to their lecture comprehension difficulties in an English-medium Engineering programme. It also investigates the students’ coping strategies utilised concerning these lecture comprehension challenges. A qualitative research design was employed to collect data through semi-structured interviews conducted with 12 engineering students. The interview data were coded thematically and analysed inductively. The study attempts to address the following key questions: what lecture comprehension difficulties did these Engineering students encounter in the context of engineering taught through the medium of English? What were the coping strategies used by them to handle those challenges? The results indicate that students, and their teachers, faced a range of challenges and difficulties and that numerous coping strategies were utilised to complete their Engineering studies.

Subjects: Language & Linguistics; Language Teaching & Learning; Languages of the Middle East

Keywords: lecture comprehension; difficulties; Omani students; English-Medium; engineering programme; coping strategies

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PUBLIC INTEREST STATEMENT

In today’s increasingly globalised world, EMI has become a popular and global growing phenomenon in higher education settings. However, there are a number of challenges presented by the use of EMI in EFL contexts. These challenges include lecture comprehension and mastering disciplinary contents and genres. My primary research interest in EMI has been fostered by several years of undergraduate and graduate EAP teaching experience at various national and international HEIs in the Gulf region. The findings and implications reported in this study might help students, disciplinary and EAP teachers to cope with their students’ lecture comprehension challenges presented by EMI more effectively. The study reported creatively deployed a number of EMI-related challenges and the coping strategies to help students handle difficulties associated with the register and discipline-specific terminology in their disciplines. The present study therefore contributes to the existing
1. Introduction

English Medium Instruction (EMI) in higher education (HE) is growing all over the world. 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., 2017, p. 37). The increasing need for highly qualified professionals, who can freely access data and communicate globally with their English-speaking international colleagues, has put EMI in the centre of curricula in universities in many parts of the world (Tamtam et al., 2012). This study is set in one of the public governmental colleges in the Sultanate of Oman and seeks to critically consider Engineering students’ lecture comprehension challenges, as well as strategies that they utilised in their EMI Engineering classes to handle such challenges. The study was first conceived from general observation and practical experience in the field of teaching Engineering students English for Specific Purposes/English for Academic Purposes (ESP/EAP) for several years in Oman. It was noted that Engineering students who studied ESP/EAP in public governmental colleges at the post-foundation level in Oman faced many linguistic and academic challenges in their disciplinary courses after their completion of both foundation and post-foundation English courses in a public college. There are several survey-based and interview-based studies which have been conducted on the area of EMI in the Arab world, and in the Gulf in particular, but most have dealt with students’ experiences in general during their pre-college stage rather than during their specialisation stage, for example, Solloway (2016), Al-Mahrooqi (2012) and Al-Husseini (2004). Therefore, this study sets out to investigate Omani engineering students’ experiences with lectures delivered in English using an exploratory research design with qualitative data obtained through semi-structured interviews.

1.1. Students’ comprehension-related challenges in English-medium programmes: survey and interview-based studies

In his study, Al Zumor (2019) identified that major challenges that resulted from EMI in teaching scientific disciplines have a seriously negative impact on the scientific content comprehension and assessment of a majority of the students in the present study of the Kingdom of Saudi Arabia where English was the language used as the medium of instruction and assessment. The findings showed that EMI causes anxiety, frustration, tension, fear, embarrassment and, ultimately, poor educational outcomes. Additionally, EMI deprives the students of their basic rights to effective understanding, communication, interaction, discussion and inquiry during lectures.

Boyle (1985) identified three main factors that may influence ESL students’ listening ability during lectures. These are speaker factors, listener factors and factors related to the materials and medium of instruction. Problems with lecture comprehension occur due to several reasons, including the mismatch between students’ and lecturers’ expectations; lack of understanding by students; and problems relating to the kind of strategies lecturers adopt (Flowerdew et al., 2000). Moreover, problems of lecture comprehension may be related to lecturers’ attributes, such as the speed of delivery, accent and interpersonal factors as well as students’ poor linguistic abilities relating to vocabulary and listening skills, including failure to understand discourse organisation (Yousif, 2006). Several studies have been conducted from lecturers’ perspectives on students’ experiences about lecture comprehension (these include: Arden-Clase, 1993; Flowerdew & Miller, 1992; Flowerdew et al., 2000; Mulligan & Kirkpatrick, 2000; Airye & Linder, 2006; Hellekjær, 2017, 2010; Sivaraman et al., 2014; Kagwesage, 2012; Joe & Lee, 2013; Rahimira & Moini, 2015; Yousif, 2006; Navaz, 2012; Sally, 1985).

A quantitative study by Hellekjær (2010) investigated lecture comprehension in English-medium higher education by comparing student lecture comprehension in English and the students’ first language (L1) at three Norwegian and two German institutions of higher education. Three hundred and sixty-four Norwegian and 47 German students were surveyed. The study compares self-assessment scores for lecture comprehension in English and the L1. The results indicated that the difference between English and L1 scores was substantial, with a considerable number of students having difficulties understanding the English-medium lecture. Among the main problems,
which were similar in English and the L1, were difficulties in understanding and distinguishing the meaning of words, unfamiliar vocabulary and difficulty in taking notes while listening to lectures. This corroborates Camiciottoli’s findings (Camiciottoli, 2019) on lecture comprehension which revealed large numbers of students expressing problems in understanding EMI lectures and identified low-language proficiency of students and teachers, and domain-specific vocabulary as the primary causes that hinder comprehension.

The study argues the need to improve the quality of lecturing in English and L1 as well as the students’ and lecturers’ English proficiency. Hellekjaer’s study provided insights into lecture comprehension problems in both English as a second language (ESL) and as a first language (L1).

A study by Arden-Close (1993) examined the kind of language problems encountered in chemistry lectures given by English and American lecturers to Omani students at Sultan Qaboos University, Sultanate of Oman. The language problems were found to be exclusively related to vocabulary and were classified as: those vocabularies having to do with the invisible nature of chemistry; those concerning the scientific and everyday use of words; and problems with synonyms used to explain words. The study suggested that the kind of learning of words that occurred in these lectures entailed a very limited knowledge of the words in question. Arden-Close’s study has provided us with an account of some Omani students’ experiences in relation to English-medium lecture comprehension problems in chemistry classrooms, and it offers good illustrative examples of EFL/ESL students’ English-medium lecture comprehension difficulties in the Sultanate of Oman.

Flowerdew et al. (2000) conducted a three-stage longitudinal study into lecturing in English to non-English-speaking students at a university in Hong Kong. The first stage of this project (Flowerdew & Miller, 1992) focused on perceptions, problems and strategies of non-native-speaking students receiving lectures in English from native-speaking lecturers. The second stage of the project focused on the lecture situation from the other side of the lecture equation, that of the lecturers. In the third stage of the project, which is reported here, the ESL lecture is investigated from the perspectives of local Chinese lecturers that share the L1 of their students and for whom English is, therefore, a second language. The main problems during lectures, as stated by all groups, were the linguistic skills of the students, speed of delivery and the inability to understand vocabulary or specialist terminology. Chinese-speaking lecturers reported having more problems due to the linguistic skills of the students during lectures than the native-English-speaking lecturers mentioned. Surprisingly, these problems seemed to stem from the Chinese-speaking lecturers’ ability to use Cantonese. Many lecturers reported pressure from students for them (the students) to use Cantonese during lectures. Students were not willing to ask questions in English during the lecture when they were having problems, and many could not take notes in English. Chinese-speaking lecturers tended to attribute the students’ weak study skills to the education system they had experienced during their schooling. Regarding the strategies employed by students to follow the lecture and handle the lecture-related challenges, they employed a variety of strategies, such as the students tended to make extensive use of their peer groups for support in understanding what was taking place in the lecture. They also made use of their reading skills, either before the lecture or afterwards, to enhance their comprehension of the topic. All lecturers attempted to modify their language when lecturing to their students. They tended to give out more handouts than they would like to; they tried to use local examples as much as possible. Additionally, lecturers used more visual aids than they were used to using to make sure that their students were following the lecture. The use of some Cantonese during lectures was considered to aid comprehension and to check students’ understanding.

Flowerdew et al.’s (2000) study is considered important in relation to lecture comprehension problems as it was longitudinal and dealt with lecture comprehension problems in an EFL context. Moreover, the study looked into both lecturers’ perceptions concerning lecture comprehension problems and into strategies used to handle these problems by both students and lecturers. However, the study did not consider the possibility that lecture comprehension problems resulted from the variation across disciplines due to the differences among various science-related disciplines.
Flowerdew and Miller (1992) conducted an ethnographic study to investigate second language lecture comprehension problems experienced by 30 Hong Kong Chinese students attending lectures in a BA TESL methods course. Questionnaires, diary completion, classroom observations and in-depth interviews were used to generate data. The analysis of the data focused on students’ perceptions of the lecture experience (attitude, self-rating of comprehension level, what students look for in a lecture, etc.). The main problems reported were the speed of delivery, terminology and concepts, and concentration. The strategies used to handle such problems were pre- and post-lecture reading, peer or lecturer help, attempts to concentrate harder and note-taking. Flowerdew et al. (2000) claimed that their study had wider pedagogical implications for both lecturers to non-natives and ESL specialists preparing students to study through the medium of English.

A study by Mulligan and Kirkpatrick (2000) looked into tertiary literacy among international students at Australian universities. The study aimed to determine the nature and extent of problems experienced by non-English-speaking background (NESB) students in comprehending lectures and it found significant gaps in understanding. The results revealed that many NESB students had problems with comprehension and note-taking in lectures. The results showed that fewer than 1 in 10 NESB students were able to understand the content and intent of their lectures very well. More surprisingly, almost one-quarter of them had not understood much of the lectures at all. The study suggested strategies for change for EAP teachers, students and core subject lecturers.

Although Flowerdew and Miller (1992) study, and the studies reviewed above, have provided some insights into the types of second language lecture comprehension problems encountered by EFL/ESL students, they did not consider Engineering students’ lecture comprehension problems and difficulties, or strategies used to handle these problems. The current study is a multi-thematic investigation into Engineering students’ experiences with EMI challenges and lecture comprehension in Oman which aims to provide a more detailed, comprehensive picture of the situation in a specific geographical and cultural context and to thereby better inform the provision of EAP during the pre-sessional and in-sessional years in that context.

A study on Omani students at an Engineering college in the Sultanate of Oman was conducted by Sivaraman et al. (2014) to understand the attitudes of teaching staff towards Engineering students’ English language difficulties. The study surveyed teaching staff about students’ learning difficulties, where English was used as the medium of instruction. The vast majority of students had had their primary and secondary education in Arabic-medium schools. They went through a bridging course in the foundation programme but their proficiency in Arabic was limited and they still had problems in understanding the engineering modules, in-class participation, in exam preparation, and their overall performance and study experience. The survey findings showed that the language barrier negatively affected the performance of the students in their engineering modules. Although Sivaraman’s et al.’s (2014) study shared contextual and disciplinary orientations with the present study, it did not collect data from students or from the foundation teachers, which might have given a different picture. Moreover, the study only used questionnaires to obtain data regarding the views of the staff about students’ difficulties.

Joe and Lee (2013) study focuses on Korean medical students’ perceptions of second language lecture comprehension. The study also scrutinised relationships among Korean medical students’ comprehension of satisfaction to EMI and on their general English proficiency. Various concerns have been raised concerning students’ difficulties in EMI lecture comprehension and ineffective interaction between lecturers and students. Sixty-one students were surveyed and sat for pre- and post-tests during English-medium and Korean-medium lectures. Surprisingly, it was found that the medium of instruction had no effect on the understanding of the lecture and that students’ general English proficiency was not related to their lecture comprehension. Based on the findings, the study has offered suggestions and recommendations for implementing EMI courses in Korea.
A study conducted by Kagwesage (2012) investigated Rwandan university students’ reflections on using English as the sole medium of instruction in their everyday HE academic tasks and duties. The data were mainly obtained via interviews. The findings suggest that the students encountered several difficulties and challenges with the newly implemented medium of instruction as their English proficiency did not match with the communicative demands of their academic tasks. However, students were very much aware of the demands of globalisation and the “dissolution” of national boundaries through new technologies, so they were willing to improve their English to cope with the new demands of the EMI academic setting. Kagwesage’s study has offered good insights into EMI difficulties in EFL/ESL contexts.

Airey and Linder (2006) investigation was aimed at the use of EMI to teach Physics at two Swedish universities. Twenty-two undergraduate Physics students attended lectures in both English and Swedish as part of their regular undergraduate programme. These lectures were videotaped and the students were then interviewed about their learning experiences using selected excerpts of the videos in a process of stimulated recall. The results revealed that there were important differences between when they change the medium of instruction from Swedish into English. The classroom interaction concerning asking and answering questions was reduced, and there was difficulty in following lectures and taking notes at the same time due to the change in the disciplinary discourse. The study found that students employed several strategies to respond to these language-related difficulties, namely, asking questions after the lecture, and reading the sections related to the lecture before class. There was a change in their study habits so that they no longer took notes in class. Airey and Linder (2006) investigation has provided a clear picture and insights about EFL/ESL students’ experience in relation to EMI.

An investigation was carried out by Yousif (2006) on the reasons for lecture comprehension problems in an EFL context, specifically in Saudi Arabia. The participants were students majoring in English. His findings showed that there were five key factors affecting lecture comprehension. The factors were: linguistic and conceptual variables (e.g., terminology); discourse variables (e.g., difficulty in understanding longer sentences); acoustic variables (e.g., speed of delivery); environmental variables (e.g., noisy classroom); and psychological variables (e.g., boredom). The current study aims to fill some gaps in the relevant literature by undertaking a comprehensive and multi-faceted approach to investigate Engineering students’ learning experiences on an English-medium Engineering programme in Oman, identifying the difficulties that were encountered with lecture comprehension and the strategies that they utilised to handle these problems. The present study also moves in a similar direction to Yousif’s (2006) work since it addresses EFL students’ experiences with EMI in their Engineering education, based on multiple sources of data (i.e. semi-structured interviews, observations and collection of documents). Yousif (2006) reported lecture comprehension problems only from students’ perspectives.

Sally (1985) investigated undergraduate Engineering students’ lecture comprehension in a Sri Lankan context. Sally exposed the participants to an experimental course in listening comprehension for eight weeks. Listening comprehension was measured, and it was found that the students had difficulties in understanding vocabulary, prepositional phrases and phrasal verbs, which in turn affected their lecture comprehension negatively. Sally claimed that the exposure to these experimental lectures enhanced the students’ lecture comprehension; however, the study did not reveal how the listening comprehension was measured. Additionally, it did not highlight the impact the differences among disciplinary contents may have had on lecture comprehension. Likewise, Navaz (2012) investigated students’ and lecturers’ experiences with lecture comprehension difficulties at the Faculty of Applied Sciences (FAS) in a Sri Lankan university. The data was collected via questionnaires, interviews and observations. The findings revealed that several factors influenced students’ and lecturers’ behaviour in class and their perception of that behaviour. Additionally, it was found that students’ lecture comprehension problems and classroom interactions were influenced and shaped by their language proficiency. Students believed the lecturers’ delivery
style to be more important than their language proficiency. However, the study did not investigate the strategies they used to handle these difficulties.

1.2. EFL/ESL students’ coping strategies with the English-medium of instruction

English-medium courses and programmes have increased dramatically in tertiary education in non-English-speaking countries all over the world. This has raised many concerns concerning the difficulties that EFL/ESL students may encounter, which may result in ineffective interaction between lecturers and students, and problems with lecture comprehension (Joe & Lee, 2013). Researchers such as Camiciottoli (2019), Kagwesage (2013), Hu and Lei (2014), Suliman and Tadros (2010), Peacock (2001), Alginahi et al. (2009), and Saat and Othman (2010) have investigated the coping strategies employed by EFL/ESL students to handle EMI difficulties and problems.

Kagwesage (2013) examined coping strategies used by multi-lingual students in Rwanda to successfully deal with complex academic material delivered through the medium of English in their Economics and Management courses. The data was collected from group work discussions and interviews; the data were analysed thematically. The findings showed that students used multiple coping strategies to handle EMI-related difficulties, including the successful use of other languages at their disposal to mediate cognitively demanding academic tasks. Interestingly, although other spoken languages are not officially recognised as media of instruction in Rwandan higher education, they played a mediating role in core subject learning through the use of code-switching and translanguaging. Kagwesage’s study has offered valuable insights into coping strategies used by EFL/ESL students to respond to EMI difficulties. However, EAP and core subject teachers were not involved in the investigation. Hu and Lei (2014) reported several coping strategies used by professors and Chinese students to deal with EMI language-related challenges and difficulties. Because of the linguistic demands of EMI, students and professors reported considerable difficulties in using English to explain sophisticated scientific concepts and complex technical terms, to explicate process and principles fundamental in their discipline, and to discuss intricate cases and develop persuasive arguments and construct counterarguments. To overcome such language-related problems, teachers reported various teaching and learning strategies they were using. One of the coping strategies adopted by core subject teachers was simplifying the curricular content. Another teaching strategy was preparing teaching notes in advance to explain the language of the textbook. Also, teachers assigned pre-lecture readings for students to preview the instructional content, as well as repeating explanations that students did not understand. Further, students were compelled by their inadequate command of English to adopt a variety of compensatory learning strategies. One of the popular strategies was to depend on Chinese references/textbooks to make sense of their lecturers and English coursebooks. Additionally, students spent a lot of time looking up unknown vocabulary in their English textbook before they went to their classes. Besides, they translated content from English into Chinese, memorised answers to tests based on Chinese and English textbooks, and avoided spontaneous discussion in English. These findings are consistent with Camiciottoli’s study which found that some students may need EMI lecturers to adapt their discourse and use different strategies to make content comprehensible, including non-verbal semiotic resources such as different types of gestures.

A study conducted by Suliman and Tadros (2010) explored coping strategies used by nursing students in Saudi Arabia to cope with foreign language-medium of instruction difficulties. A descriptive repeated-measure design was used; seventy-eight students were surveyed three times. The findings showed that students’ coping strategies were changing in this context. Some coping strategies, such as positive reappraisal, planful problem-solving, self-controlling and seeking social support were rated as the highest at the beginning of the semester. However, they decreased significantly in the middle of the semester. Confrontive coping and distancing increased significantly by the end of the semester. Positive reappraisal and planful problem-solving deal with inspiration to analyse and solve difficulties and problems. In this case, the teacher should boost students’ confidence to work out a couple of different solutions, such as setting a plan of action and doubling efforts, and changing strategies of studying and this would help to deal with such problems. Self-controlling as
a strategy requires avoiding frustration to facilitate learning English, and here the teacher should instil confidence in their students when they are stuck and stressed. Seeking social support includes getting advice from teachers, students, and relatives on how to cope with English-language-related challenges. Further, Suliman and Tadros (2010) pointed out that students' choice of confrontive coping and distancing by the end of the semester may signal that they are stressed and imply that the teachers may need to support them by giving them positive feedback, offering them academic counselling sessions and enhancing their understanding of effective coping strategies in relation to learning English as an EFL or ESL medium of instruction. The study concluded that nursing students utilised a variety of strategies which changed over time. The researchers argued that the responsibility for coping with the English-medium of instruction is a shared one which rests on the collective efforts of students, faculty and management. Suliman and Tadros's study has provided insights into EFL/ESL students' coping strategies. The method of data collection was limited to surveys. The current study moved beyond surveys by using in-depth interviews and observations.

A study conducted by Peacock (2001) examined strategies adopted by EFL learners to cope with English as the medium of instruction. The following six strategies were examined: cognition, compensation, memory, metacognition, socialisation and affection. His focus was on the relationship between the strategies learners use and their language proficiency. He found that the strategies linked with language proficiency were compensation, metacognition and cognition. Indeed, these coping strategies might be used by EFL students in different contexts, however, a study which moves beyond surveys as a method of data collection is needed to provide a picture of the experiences of EFL/ESL students beyond descriptive methods of data collection to take into account both students' and teachers' perspectives.

A longitudinal case study was conducted by Hung (2009) at Hong Kong University to report two types of difficulties EFL business undergraduate students experience with writing tasks in their marketing programme. Students reportedly used the following strategies to deal with EMI challenges and complete their writing tasks: use of L1, collaborative and group work, the Web, and guessing the potential reader expectations. Such studies seem to suggest that better support is needed to help EFL/ESL students to cope with their English-medium programmes. Given these potential context-specific issues and given that most studies have been conducted on non-engineering disciplines, the need becomes apparent for more studies to explore students' experiences on English-medium programmes (Kachru, 1992).

Alginahi et al. (2009) evaluated Information and Communication Technology (ICT) students' coping strategies in dealing with English as the medium of instruction in their university studies. Two hundred and sixty-seven students were surveyed at a Computer Science College in a Middle Eastern University. Moreover, the study used a phenomenological approach with semi-structured interviews with 10 students. The responses from students showed that having English as a medium of instruction was a source of stress to them.

Saat and Othman (2010) explored the perceptions of and challenges experienced by Malaysian pre-service teachers teaching science in a second language. A qualitative case study with multiple methods of data collection, namely, interview and observation, were utilised. The study provided insights into the challenges a group of pre-service science teachers encountered with English-medium classes during their practicum and the strategies that they used to handle them. These teachers had to overcome difficulties, which arose due to their lack of competency in English, and the students' varying degrees of language ability. These teachers employed several strategies to overcome such challenges, such as code-switching and mixing, teacher-student collaboration, rephrasing and re-emphasising, the use of instructional aids and the use of analogies. The study recommended that attention should be given to address English language policy in the science teacher education programme. Saat and Othman provided useful illustrative examples of the types of challenges EFL/ESL students experience on their English-medium programmes and the strategies that they use to overcome such challenges. However, the study did not consider students' voices. Therefore, the present study attempts to address the following key questions: what lecture comprehension difficulties did
these Engineering students encounter in the context of engineering taught through the medium of English? What coping strategies did they use to handle those challenges?

2. Methods
The present study employs a qualitative research design underpinned by a case study approach. Semi-structured individual interviews with 12 engineering students in a college of technology in Oman were 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). Sampling is determined by the type of research under investigation (Yin, 2009). This study utilises a purposive sampling procedure usually used with the multiple structure population of many groups. Engineering students in each section or department represent a group and their speciality and level could be considered as sub-groups. A sample was drawn to represent all these sub-groups in this particular college to allow the researcher to satisfy the needs of the study (Robson, 2002). The study focuses on engineering students, mainly in one Omani public college in Oman. The sample consists of 12 students—nine male and three female—selected out of the population studying engineering as a major subject in this particular college. Their ages ranged between 20 and 24 years. All had a similar linguistic background, as Arabic native speakers, and they had been instructed in the same educational system in Oman before they were enrolled in HE institutions in Oman. Therefore, the selected groups of students were relatively homogenous in educational level and the number of years of pre-university instruction in the English language.

The interviews in this study were conducted to explore Engineering students’ perceptions of Omani Engineering students concerning their lecture comprehension difficulties in an English-medium Engineering programme. It also investigates the students’ coping strategies utilised in relation to these lecture comprehension challenges. The student interviews were principally conducted in Arabic to encourage the students to better express their opinions and views through their first language. The interviews lasted approximately 45 minutes on average. As permission was gained from the college, it was agreed that the student interviews should be carried out during breaks and free time, and the time and place were decided by students. All student participants signed a consent form.

The interview data were coded thematically and analysed inductively. The study attempts to address the following two key questions: what lecture comprehension difficulties did Omani Engineering students encounter in the context of engineering taught through the medium of English? What coping strategies were used to handle those challenges?

Techniques for establishing credibility and trustworthiness of research, such as prolonged engagement, persistent observation, triangulation, referential adequacy, peer debriefing and member checking (Lincoln & Guba, 1985), were used to sustain the credibility of the findings of the present study. Levels of trustworthiness were also enhanced by giving the research participants opportunities to refuse to participate in the study, to ensure that the sessions of data collection involved only those who were genuinely and freely willing to take part in the study (Shenton, 2004, p. 66).

3. Findings and discussion

3.1. EMI lecture comprehension-related challenges
Omani Engineering students repeatedly complained of difficulties in comprehending lectures delivered in English. This was despite EMI being considered an effective way to improve students’ language proficiency by using English to acquire subject knowledge (Joe & Lee, 2013). The following interview extract is indicative of students’ problems with lectures delivered in English (student contributors have been given numeric codes):

I had several problems in understanding lectures delivered in English. Therefore, if I haven’t understood something during lectures I can ask my friend to explain to me in Arabic. If
asked to study Engineering in either English or Arabic I would choose English because if I study in Arabic I wouldn’t find a job to secure my future. Some Engineering professors are Arabic speakers, and they can simplify things and say them in Arabic and we have found that beneficial for us. Some of my friends use Arabic to explain new instructions and machine manuals for us. Friends use Arabic to write their assignments and then translate them into English using translation technology (S10).

Indeed, EMI presented a challenge for students to understand engineering lectures; however, they employed many strategies to handle such challenges and difficulties. Although the students reportedly developed disciplinary knowledge while progressing in their studies, many encountered problems with lecture comprehension. These problems exist due to several reasons, namely, the mismatch between students and lecturers’ expectations, lack of understanding by students, and problems relating to the kind of strategies lecturers adopted (as reported by Flowerdew et al., 2000). Moreover, the problem of lecture comprehension may be related to lecturers’ personal attributes, such as the speed of delivery, accent, and interpersonal factors, as well as to students’ poor linguistic abilities, such as lack of vocabulary and limited listening skills (Yousif, 2006).

Another student described his difficulties with lecture comprehension as follows:

I have difficulties in understanding the tutors’ accents and I also found them unintelligible for me. I sometimes find it difficult to take notes during the class as some teachers use difficult and highly technical language. I sometimes try to record the lecture to listen to it at later stages. I use online dictionaries to help me to find out their meanings (S6).

Some students reported that they experienced difficulties in taking notes and even in engaging in classroom discussions. They used several compensatory strategies to handle these problems, including those problems indicated by student S6 above.

Students’ lecture comprehension difficulties were persistently evident. Particular lecture comprehension problems were a consequence of lecturers’ speed of delivery, as indicated by the following interview extract:

I have difficulties in understanding and comprehending engineering lectures because of the level of my English. Moreover, I have problems with following my teachers when they speak during lectures. All these could be considered challenges which have a great impact on my academic performance (S5).

There was evidence that the problems with lecture comprehension and technical terms could be attributed to the fact that all students studied in Arabic in their schools:

The English language was a great challenge for me because we studied all subjects in Arabic in schools. Moreover, the kind of English that we studied in schools is different from the kind of English at college. Because the English in our college is highly technical and complicated. In secondary schools, we studied general English and the words used were very simple and they were not useful for us now. At the college the situation is quite different, all words are linked to speciality and when you revise and read your Engineering textbooks and materials you have to understand them within the context of Engineering. They need more effort and practice to be internalised and understood (S5).

The quote above underlines the challenges created by the transition from Arabic-medium education to English-medium education to these engineering students.

Well ... I don’t have any problems with comprehending lectures due to the use of English. I sometimes have some difficulties but not because of the language but because some concepts are challenging and they need time to be fully understood (S10).
Sure, in certain courses and lectures this depends on who is the lecturer and his nationality and accent as well. Some lecturers speak very fast so I couldn't follow them and take notes. Some of them use a very complicated and highly complex language and this makes it difficult to understand. Lecturers sometimes ask very difficult questions during their lectures and I feel embarrassed in answering their questions (S6).

I haven't encountered such great challenges but sometimes I have difficulties in understanding the tutors' accents and I find them unintelligible for me. Their speed of delivery is also another story, some of them just speak even faster and I could not follow them or even be able to take notes. As we are computing engineering students we usually concentrate on applications rather than theories, therefore, we sometimes encounter some problems with such applications and we couldn't fix them (S4).

In theoretical classes, students need to listen, take notes and seek clarification from their teachers by asking questions and raising issues related to the content of the lecture. However, this was not an easy task for my interviewees. Lectures are not only about theories but also about sounds (for example, pronunciation and accent), inferences made from body language (for example, from emphasis or intonation), concentration and multitasking (for example, listening and taking notes). Furthermore, lectures presuppose knowledge of technical registers. My interviewees had problems with most of the above.

This study's findings seem to be consistent with the literature (for example, Al Zumor, 2019; Sivaraman et al., 2014; Joe & Lee, 2013; Hellekjær, 2010; Kagwasage, 2012; Navaz, 2012; Hellekjær, 2010; Yousif, 2006; Airey & Linder, 2006; Flowerdew et al., 2000; Mulligan & Kirkpatrick, 2000; Arden-Close, 1993; Flowerdew & Miller, 1992; Sally, 1985). It is widely recognised that non-advanced EFL/ESL students tend to experience difficulties with the triple burden “of simultaneously listening, reading/deciphering visual and taking notes” (Flowerdew and Miller, 1992, p. 126). In the case of Omani Engineering students, their difficulties with lecture comprehension seemed to be exacerbated by the teachers’ use of inappropriate teaching methodologies and speed of delivery.

Students find it difficult to ask questions during lectures and to seek clarification due to their lack of communication skills and low English language proficiency. Hellekjær (2010) conducted a comparative study in the Norwegian context related to lecture comprehension. In it, some issues were underlined, such as understanding and distinguishing the meaning of words, dealing with unfamiliar vocabulary and taking notes while listening to lectures. Hellekjær confirmed that students' language problems with lecture comprehension often resulted from poor pronunciation and technical and specialised vocabulary. It is noteworthy to add that Hellekjær detected many of these problems in L1 lectures, too. This would imply that they are a direct consequence of “socializing students into domain-specific academic genres and registers” (p. 248) rather than of the language of instruction.

The present study corroborated Hellekjær’s findings among Omani Engineering students. Indeed, a participating student stated that:

I sometimes had problems with following the lecturer when [they were] delivering their lectures. Some of them speak very fast and their pronunciations were not clear enough. I sometimes had difficulties in taking notes. I had difficulties in understanding some new technical vocabulary. I had my diary for the new technical words and take this diary with me wherever I go and I keep repeating the pronunciations and meanings of these words until I understand and memorise them (S11).

The Omani Engineering programmes studied in this research suggest that there is a need for addressing factors contributing to lecture comprehension. The difficulties must be acknowledged and solutions must be sought. For example, students should be helped to familiarise themselves with the Engineering discourse, genre and technical terms. This is necessary for their academic socialisation. Naturally, this entails a process that cannot be successful without the participation
and commitment of the four main constituents: the Ministry of Manpower (which runs the colleges), the curriculum and exam designers, the language centres (including the teachers), and the students. Such a process is complicated by a relatively rigid centralisation among the colleges of technology, which thwarts localised innovation, and the mentality of the students, who are generally do not appreciate that real learning cannot happen without their essential participation. After all, neither the most innovative curriculum nor the best teacher can ever replace the students’ involvement in the processes of learning.

The importance of the students as a variable can never be overstated. Hence, it is paramount that the education providers understand the factors which influence ESL/ESL students’ lecture comprehension, be they related to their speaking or listening, or to the materials and medium of instruction (Boyle, 1985).

Problems with lecture comprehension can arise for several reasons, such as strategies adopted by lecturers, the mismatch between students’ and lecturers’ expectations, and lack of understanding by students due to their poor vocabulary and listening skills. Yousif (2006), dealing with factors affecting Saudis’ lecture comprehension, showed that there were five main factors: linguistic and conceptual variables (for example, terminology), discourse variables (such as difficulty in understanding longer sentences), acoustic variables (e.g., speed of delivery), environmental variables (such as noisy classrooms) and psychological variables (including boredom). Interestingly, these difficulties seem to be universal in English-medium programmes in higher education around the world. Evans and Morrison (2011) reported almost identical findings from an interview study conducted among first-year undergraduate students at Hong Kong Polytechnic.

Similar findings were reported by Sivaraman et al. (2014), who surveyed Omani Engineering students’ and teachers’ attitudes towards difficulties arising from EMI, including understanding engineering modules, participating in the classroom and exams. However, most of the findings of these studies were based on data collected through questionnaires and surveys rather than in-depth interviews and classroom observations. Nonetheless, the present study also found that the interviewed Omani Engineering students experienced the usual challenges related to the comprehension of English-medium lectures and the transition from Arabic-medium schools to English-medium higher education institutions.

### 3.2. Lecture comprehension-related coping strategies

The Omani engineering students participating in this study utilised a variety of coping strategies during their engineering studies. 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 that:

> 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 about 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 by the students 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).

Bilingual dictionaries seem to be frequently used as a compensatory strategy to help students cope with their discipline-specific terms and concepts. Both the students and the teachers were aware of the benefits of using bilingual dictionaries in their Engineering studies.

Lecture comprehension-related challenges in English-medium Engineering classes were prominent amongst those encountered by interviewed students. Concerning coping strategies one student remarked that:

There are a couple of strategies that we used to deal with such challenges. For the speed of delivery, we sometimes interrupt the instructor and we ask him or her to slow down and repeat the topic or point. We sometimes talk to each other in Arabic and explain the topic to our friends in Arabic. Additionally, we ask the instructors to simplify their language and give examples from real life to make their point clear for us (S2).

All these difficulties and coping strategies were apparent during the classroom observations and they were confirmed by another student:

We usually work in groups in the practical part and we help each other to do the task. Our teachers often give examples from real life that would usually help us to understand in a better way. (S7).

For this interviewee, the biggest problems during lectures had to do with understanding theoretical explanations. The practical parts of lectures or lab sessions are arguably easier to follow as the students see what the instructor does. Theories must be visualised and, in most cases, students must do that by understanding words and grasping the logical connection being made between them.

4. Conclusions, implications and recommendations
To conclude, the results of this study are consistent with previous studies on EMI literature around the globe in terms of lecture comprehension challenges caused by EMI in terms of challenges which impacted the acquisition and mastery of disciplinary content negatively (for example, Al Zumor, 2019; Sivaraman et al., 2014; Joe & Lee, 2013; Kagwasage, 2012; Navaz, 2012; Hellekjær, 2010; Yousif, 2006; Airey & Linder, 2006; Flowerdew et al., 2000; Mulligan & Kirkpatrick, 2000; Arden-Close, 1993; Flowerdew & Miller, 1992; Sally, 1985).
The EMI-related challenges indicated by the Engineering students who participated in the present study could be attributed to some contextual and language-related factors. The problems concerning lecture comprehension seemed to be exacerbated by the use of inappropriate teaching methodologies and by teachers’ speed of delivery. Students may not be able to interrupt their teachers and ask questions to seek clarification due to their lack of communication skills and low English language proficiency. These findings suggest that there is a need to address key factors contributing to lecture comprehension difficulties and challenges. Familiarity with Engineering discourse, genre and technical terms is of vital importance. Therefore, academic socialisation in the Engineering registers seems vital for all Engineering students and graduates to enable them to be active participants within that discourse community. Moreover, the students indicated that their educational backgrounds in schools, and the use of Arabic as a medium of instruction, were a major contributing factor to their difficulties and challenges. The key problem encountered in EMI lectures was their inability to take notes and to use English to communicate with their Engineering teachers by asking questions, seeking clarification or commenting on the delivered content. This reflects the problem with comprehending lectures in an EMI engineering context in Oman. The majority of these problems and difficulties have been experienced by other EFL/ESL students and have been reported in the literature. Gearing the foundation and post-foundation programmes towards the Engineering speciality would help students to be socialised and enculturated in their academic disciplines and discourses. Moreover, from the responses presented, it could be argued that reviewing and restructuring the pre-university preparation programmes is a necessity. Tensions between content subject teachers and EAP teachers about students’ language-related problems could be effectively addressed through collaboration and cooperation between the two parties. Nevertheless, this could be best addressed by establishing official mechanisms for cooperation and collaboration for the sake of helping students to overcome their language-related difficulties more effectively and successfully. Omani Engineering students participating in this study revealed that they adopted several coping strategies to deal with EMI language-related challenges and difficulties. Their key coping strategies 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, the mother tongue (Arabic) was used by students to help each other during lectures. The translation was also another widely used coping strategy used by students to overcome their EMI challenges and difficulties.

Having interviewed Engineering students, the evidence which informs this study suggests some possible strategies which could help students to overcome EMI challenges and difficulties. The findings of the present study could also be used to inform the development of materials for training Engineering teachers on how to successfully deliver their content through the medium of English. Ideally, this could be done by using extracts from EAP and Engineering teachers’ suggestions on how to help students to overcome their EMI-related problems and difficulties. There is clear evidence that if subject teachers know their students’ mother tongue this helps them to enable learning. Collaboration between English language teachers and Engineering and core subject teachers is needed to address the roots of these linguistic problems. Study skills courses on note-taking, academic and transferable skills should be made available to Engineering students before they join their technical specialities. Further, a much greater number of Engineering teachers should be trained on pedagogical issues and how to use EMI successfully and purposefully to release the great potential of EMI higher education in Oman. Engineering students need training on how to cope with the difficulties and challenges presented by EMI and this could be done collaboratively between Engineering and EAP teachers.
Finally, the study recommends that Engineering teachers need to promote the judicious use of L1 by students in their Engineering classes, in some cases as a coping strategy, as this might help students’ understanding and comprehension of their disciplinary terms and concepts. The present study has some limitations which merit consideration. The reported findings were based exclusively on interview data, considering the observational and documentary data add more insights. Finally, the number of student participants was only 12 students. Having Engineering and EAP teachers’ views onboard might add more perspectives to the study. So the findings of the study should not be generalised and should be interpreted with caution.

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Appendix A

Table 1: Interview coding scheme Students’ Interviews Coding Scheme

| No. | Code | Definition |
|-----|------|------------|
| 1.  | EMI LNG CH | This code refers to when students talk about their language-related challenges encountered during their undergraduate engineering programme. |
|     | EMI Language-related Challenges | |
| 2.  | LEC COM CH | This code refers to when students talk about the lecture comprehension-related challenges and difficulties. |
|     | Lecture Comprehension-related Challenges | |
| 3.  | ST COP STR | This code refers to when students talk about the coping strategies that they used to cope with EMI challenges in their engineering classes. |
|     | Student Coping Strategies | |
| 4.  | LI USE | This code refers to when students talk about the use of L1 in their engineering classes by their peers and teachers. It also may include students’ views on their preference/no preference for the use of the L1 by teachers in delivering their engineering classes. |
|     | First Language Use | |
| 5.  | CS EMI CH | This code refers to when students talk about the causes of EMI challenges in their engineering classes. |
|     | Causes of EMI Challenges | |
| 6.  | EMI CH IMP ST STU | This code refers to when students talk about the impacts of EMI challenges on their studies and their entire degree. |
|     | EMI Impact on Students’ Studies | |
Appendix B

Table 2: Engineering student participants’ profiles

| Student participant | Gender | Nationality | Specialty/Major            | Level              |
|---------------------|--------|-------------|-----------------------------|--------------------|
| S1                  | M      | Omani       | Mechanical Engineering      | B-Tech Final Year  |
| S2                  | M      | Omani       | Mechanical Engineering      | B-Tech Final Year  |
| S3                  | M      | Omani       | Mechanical Engineering      | B-Tech Final Year  |
| S4                  | F      | Omani       | Computer Engineering        | BSc Final Year     |
| S5                  | M      | Omani       | Mechanical Engineering      | B-Tech Final Year  |
| S6                  | M      | Omani       | Mechanical Engineering      | Higher Diploma    |
| S7                  | M      | Omani       | Mechanical Engineering      | Higher Diploma    |
| S8                  | F      | Omani       | Computer Engineering        | Higher Diploma    |
| S9                  | F      | Omani       | Computer Engineering        | Higher Diploma    |
| S10                 | M      | Omani       | Mechanical Engineering      | B-Tech Final Year  |
| S11                 | M      | Omani       | Electric engineering        | B-Tech Third Year  |
| S12                 | M      | Omani       | Telecommunication engineering| B-Tech Third Year  |
