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Exploring Iranian and Turkish faculty members' views toward using Augmented Reality English Trainer (ARET) application for educational purposes: A Comparative Study in different university faculties

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Abstract: The advancement of technologies especially Augmented Reality (AR) in the field of education has brought special conditions where teachers and learners have controversial perspectives in using new technologies for educational purposes. Therefore, this study tried to investigate the faculty members' ideas about Augmented Reality English Trainer (ARET) as a researcher-made application in the contexts of Iran and Turkey to ensure how educational beneficiaries can implement this application in face-to-face or distance education, and how their views are different. Subsequently, the basic phenomenological-qualitative design was chosen by the researchers of the study to investigate the views of faculty members in these countries. To do so, an online elite interview (based on Instant Messaging Applications and Google Forms) was designed with seven questions to reflect the faculty members' views during using ARET as an educational application by focusing on English vocabulary learning. Therefore, the mentioned questions were sent to the faculty members in Anadolu University (Eskişehir, Turkey), Uludağ University (Bursa, Turkey), Islamic Azad University Central, and West Tehran branch (Tehran, Iran) through convenient sampling and snowball sampling. The results of transcription and theme analysis of interviews in the NVIVO software revealed that both Turkish and Iranian have positive views toward using ARET in face-to-face or distance education and found it as an edutainment application. Despite the disadvantages like distraction, lack of access to mobile phones, short time lessons, and inequality in education which were mentioned by the participants of the study; Iranian and Turkish faculty members mentioned that ARET can increase the intrinsic and extrinsic motivation of learners. Although ARET has some technical issues like insecure installation, it can

be implemented as an educational AR-based application in educational systems. Various educational beneficiaries like material developers, game and application designers, teachers, and learners can benefit from the results of this study.

Keywords: Augmented Reality (AR), Faculty Members' Views, Augmented Reality English Trainer (ARET), Comparative Study, Turkey, Iran

INTRODUCTION

The digital revolution in different fields of education has put educators and institutions in the challenge of integrating recent technologies with educational purposes (Butler-Adam, 2018; Collins and Halverson, 2018). In other words, the advancement of computer sciences in introducing new technological devices has forced the educational beneficiaries to rethink and also redefine teaching and learning approaches (Cunha, Chunchu, & Maziriri, 2020). Therefore, teachers and learners experience the transformational shift from traditional methods of teaching and learning to the digitalized forms by bridging the virtual, augmented, and real-world characteristics (Ebert & Duarte, 2018; Molnár, Szűts, & Biró, 2018). These new digitalized technologies can improve the learning and teaching outcome.

Although technological devices especially computers and mobiles are different in shapes and uses, new features and unique characteristics such as creative features, interactive environments, authentic materials, visualization of complex and abstract concepts, and portability of new technological systems like Augmented Reality (AR) have provided different opportunities for this transformational shift (Picciano, Seaman & Allen, 2010; Revees et al., 2021; Videnovik, Trajkovik, Kionig & Vold, 2020). Educational practitioners can use these features to experience a situation that was not possible before integrating these factors with simple educational technologies (Köse & Güner-Yildiz, 2021).

According to recent studies, technological instruments like Virtual Reality (VR), AR, and mixed realities can be mentioned as the key emerging technologies for educational purposes and their significant possibilities have made them special and unique (Alemi & Khatoony, 2020; Kljun, Geroimenko, & Pucihar, 2020). In other words, AR can bridge the gap between the real and virtual world and it can support new shape of reality by offering interactive experiences and enriching the real world. Moreover, the accessibility and availability of AR in every portable device (e.g. mobile phones or smart tablets) allow learners and teachers to use it for their educational goals. For instance, learners can participate in an active real environment as usual but they can engage with extra visual options that can be added to the real context by AR facilities (Altinpulluk, 2019). Furthermore, layering data on three-dimensional spaces or the enriched real world with virtual or visual additions are provided by AR. These features can increase access to the information for learners and teachers (Altinpulluk, Kesim, & Kurubacak, 2020).

Even though recent technologies like AR have put their importance and application into the heart of education beneficiaries, there are controversial ideas and views toward using these technologies in educational contexts (Alalwan et al., 2020). For instance, some recent studies have reported positive attitudes toward using AR in classrooms (e.g. Sahin & Yilmaz, 2020), and some of them have reported its weaknesses, such as the need to use the most up-to-date computer systems, especially mobile phones (e.g. Chen et al., 2020). In addition, AR can provide an opportunity to learn and teach without any interruption in a situation that people cannot meet each

other safely like the Coronavirus pandemic (Tomlinson, Hendricks, & Cohen-Gadol, 2020). In addition to this, AR plays a significant role in changing the educational systems position because it can create creative and flexible environments for students and teachers (Fan, Antle, & Warren, 2020).

Therefore, the contradictory views and perceptions toward using AR for educational purposes should be investigated to provide a clear viewpoint on the future of educational technologies. Moreover, further studies about this issue can make the path of transformational shift brighter and lighter than past. This path helps educational beneficiaries to benefit from the advantages of using AR platforms. In addition, few studies in the related literature have investigated the vies of teachers or faculty members toward using AR applications. To clarify the usability of AR applications for educational purposes, this study aimed to investigate the mentioned goals through examining an AR-based application named by Augmented Reality English Trainer (ARET) as a researcher-made application. In other words, this study was an attempt to investigate the faculty members' views toward using ARET for educational purposes. To achieve the objectives of the study, the phenomenological-qualitative design was used to consider faculty members' views in two different countries (Iran and Turkey). Subsequently, the following research question was raised by the researchers of the study:

RQ. How do faculty members' perceptions/views differ in using ARET as an educational instrument in Iran and Turkey?

Thus, this study has investigated the mentioned research question through a phenomenological-qualitative method by comparing the results of the study. The main sections of the study will be followed by a short review of related literature about different views toward using educational technologies especially AR in education. Methods and data collection procedures are provided in section three and at last findings and conclusions will be reported in the last sections.

LITERATURE REVIEW

Recent studies about the perspectives of different educational classes toward using technologies are reported in this section of the study to provide a basis for the current research.

Perspectives toward using AR

Reviewing the literature on the transformational shift from the traditional way of teaching to digitalized one, have shown that identifying techniques and implementing new Educational Technologies (EduTech) such as AR or VR comprised with different perspectives from the instructors and students' points of view (Dunleavy & Dede, 2014). In other words, educational beneficiaries have reported verities of perspectives toward using technological-based materials inside the classrooms or in distance education (Bujak et al., 2013). Therefore, although technological-based teaching and learning can be considered as a powerful approach in education, teachers and learners have controversial ideas and perspectives toward using them for educational purposes (Lasica, Meletiou-Mavrotheris, & Karzis, 2020).

Subsequently, many instructors and material developers have revealed that EduTech branches and hot trend technologies like AR can enhance the learning achievement, motivation, and attitudes among learners (Altinpulluk, 2019, Koutromanos & Mavromatidou, 2021). Moreover, some studies reported the increasing interest of teachers and institutes in using AR and

other EduTech devices in face-to-face classrooms or distance education because these facilities can manifest and improve the learning behaviors in special skill or ability and they can transfer knowledge from short-term memory to long-term memory as a result of deep impression (Khatoony & Nezhadmehr, 2020). In addition, learning through real-life situations can be seen in teachers who used AR-based or other technological-based classrooms (Saundarajan et al., 2020). Therefore, most of the studies in the related literature have shown the positive and strong points of new technologies for educational purposes (Altinpulluk, Kesim, & Kurubacak, 2020; Koutromanos & Mavromatidou, 2021).

On the contrary way, some instructors believe that well-designed technologies may influence learning behaviors for a short time because the measurement of technological approaches is not enough (Dunleavy, Dede, & Mitchell, 2009). In other words, the measurement of EduTech-based learning should be done in great depth by using varieties of research designs such as large-sample design, rigorous experimental design, and in-depth statistical methods to ensure that learners reflect their real opinions and attitudes (Da Silva et al., 2019). Moreover, as extrinsic motivation can be increased through facing new technologies or new teaching approaches, presenting cognitive tests or interviews may mitigate the actual performance of learners (Alkhattabi, 2017). Additionally, many teachers especially in under-developing countries may consider AR or new technological teaching materials as expensive or useless materials because they believe that providing technological facilities is not easy for many learners or educational institutes (Khatoony & Nezhadmehr, 2020). Thus, the transformational shift in educational fields cannot be equal in all countries around the world because of political or economic issues. Furthermore, the lack of enough planning and developing materials in EduTech especially AR and VR put the potentiality of these devices under question (Gargrish, Mantri, & Kaur, 2020).

Even though recent studies in the literature have identified the increasing interest toward implementing AR and other EduTech for educational purposes (Alemi & Khatoony, 2020; Altinpulluk, Kesim, & Kurubacak, 2020), there are various studies that reveal controversial issues and perspectives (Khatoony & Nezhadmehr, 2020; Koutromanos & Mavromatidou, 2021). Therefore, more investigations should be done in a comparative way to show the progress of using AR educational purposes. Furthermore, there are a few studies that show the different views especially from the faculty members' points of view in a comparative way. Subsequently, this study was an attempt to compare the views of faculty members toward using new mobile applications based on AR to provide a clear understanding of using AR applications in countries like Iran and Turkey.

Rationales of the study

Educational fields or in particular language learning are associated with different teaching and learning methods. For instance, traditional teaching and learning pedagogies and assistance of technologies in the field of education are comprised of different controversial views. As mentioned by recent studies (Kurubacak & Altinpulluk, 2018; Lasica, Meletiou-Mavrotheris, & Karzis, 2020), the development of learning and increasing the quality of teaching have tied with updating the knowledge and recent technologies. Although EduTech should be brought into the heart of education both in distance and face-to-face education to achieve the educational goals (Alalwan et al., 2020), the investigation of learners' and teachers' views toward using these technologies can help educational beneficiaries to have unified ideas. To explain it clearly, controversial attitudes

and beliefs toward new technologies like AR and also policies and rules in educational fields in different countries should be compared and evaluated. Moreover, other issues like lack of material resources, the feasibility of technologies, and the level of efficacy of new technologies like AR should be explored from the views of faculty members because their experience and familiarity in EduTech can show the future of implementing technologies in education.

Given this importance, faculty members should identify their views and reflect ARET's positive points and weaknesses as and EduTech and accordingly take appropriate remedial steps so as to aid them to fix the problems. In addition, what distinguishes this study from other studies is the use of new technology of AR as researchers-made software (ARET) which is a highly advanced feature of today's facilities to replace real environments. Moreover, this study can be significant in the case of comparing faculty members' views in two different countries of Iran and Turkey to ensure the advantages and disadvantages of ARET.

METHODOLOGY

Research Design, demographic information of participants, instruments of study, data collection procedure, and data analysis of this study are described in the following sections.

Research Design

The basic phenomenological-qualitative was selected to investigate the faculty members' views toward using ARET as an educational technology (See Figure 1). The rationale for selecting this research design was that this method can describe a phenomenon or process by comparing different ideas and perspectives (Ary et al., 2018). In other words, the researchers used a basic phenomenological-qualitative study because this type can investigate the faculty members' points of view by using varieties of disciplinary questions through comparing the results from Iranian and Turkish faculty members (See Figure 1).

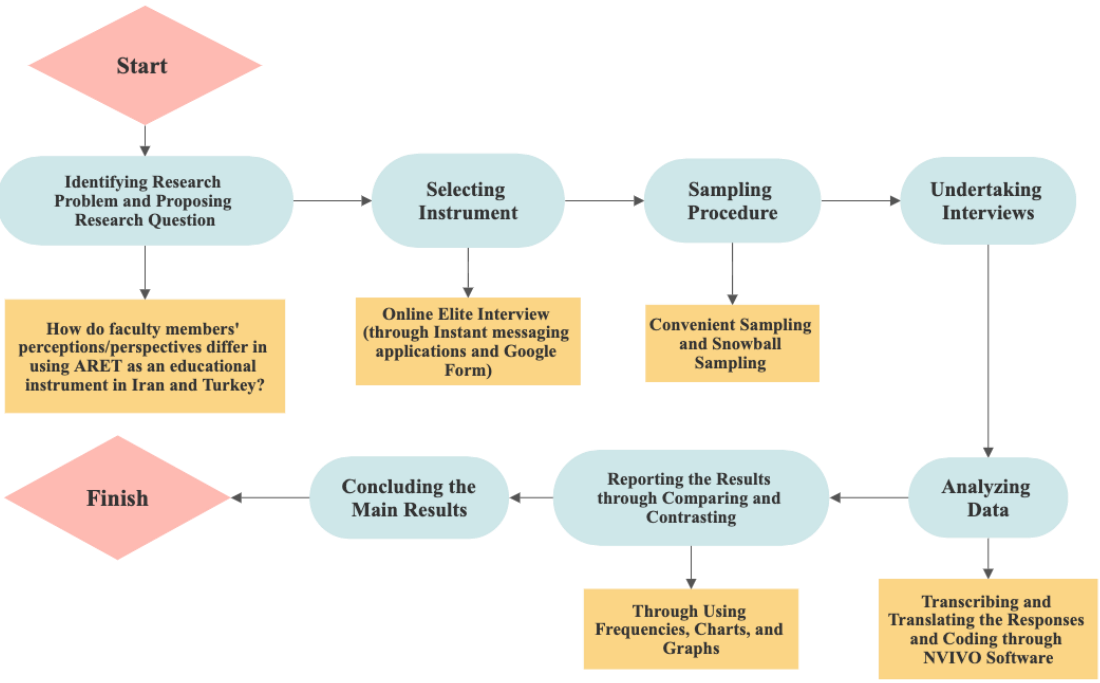

Figure 1: Research Process

Participants

To achieve the goals of the current investigation, the faculty members of Anadolu University (Eskişehir, Turkey), Uludağ University (Bursa, Turkey), Islamic Azad University Central branch, and West Tehran branch (Tehran, Iran) were selected as the participants of the study. To explain it clearly, faculty members of these universities can be defined as the lecturers, assistant professors, and full professors who use technology face-to-face or in distance education. In other words, the researcher asked faculty members' views toward using ARET as a researcher-made application for educational purposes in two contexts of Iran and Turkey (See Table 1. for further details).

Table 1: Demographic Information of Participants

Demographic Variables	Frequency of Iranian Faculty Members	Frequency of Turkish Faculty Members
Gender	Female (N=9) Male (N=6)	Female (N=11) Male (N=4)
Age	29-65	29-57
Educational Majors	Linguistics Applied Linguistics	Distance Education Education Education and Technologies Medicine Engineering Economy
Degree of Education	Bachelor Degree (N=0) Master Degree (N=2) Ph.D. Degree (N=11) Post-Doc Degree (N=2)	Bachelor Degree (N=0) Master Degree (N=2) Ph.D. Degree (N=11) Post-Doc Degree (N=2)
Total	15	15

It is worth mentioning that, the participants of the study were selected through convenience sampling and snowball sampling. More particularly, they were chosen through convenience sampling because some of them were easy to access and easy to reach. Then, the researchers asked participants to introduce people who are eligible and feasible for the study by using snowball sampling. The reason for selecting these participants was that views toward using an AR application like ARET should be reported by experts who are aware of the usage of AR (Ary et al., 2018). Therefore, this study has investigated the experts' points of view toward using ARET.

Instruments

Following sections describe the instruments of the study to investigate the faculty members' views toward using ARET for educational purposes.

Augmented Reality English Trainer (ARET)

According to the importance of Computer Assisted Language Learning (CALL), Mobile Assisted Language Learning (MALL), and Augmented Reality Assisted Language Learning (ARALL) in language learning and teaching, the mobile application of Augmented Reality English Trainer or ARET (for Android mobile phones) was designed by the researchers of the study based. ARET is a completely EduTech application based on educational purposes (particularly language learning) and gamification principles in terms of giving scores and bonuses. This application was designed and created through the game engine of Unity Software Pro Version 2019.3.2 by underlying themes for teaching and English for vocabulary learning as an important English component. Since the main goal of ARET is vocabulary presentation, the content of the ARET was selected from English vocabularies (Extracted from 1100 Vocabulary for IELTS book as a valid and reliable book in language education). AR images were designed to help teachers and learners to comprehend more efficiently (See Figures 2-4 for more information). By this aim, the researchers of the study have used realistic and meaningful 3D objects to present the English vocabularies through AR images. Therefore, learners and teachers can use ARET to learn and teach new vocabularies through watching, tracking pictures, and moving them in a real and safe environment by opening the cameras of mobile phones. It is worth mentioning that, users can have the ability to listen to the pronunciation of vocabularies both in British or American accents.

Figure 2: ARET's Logo and Main Menu

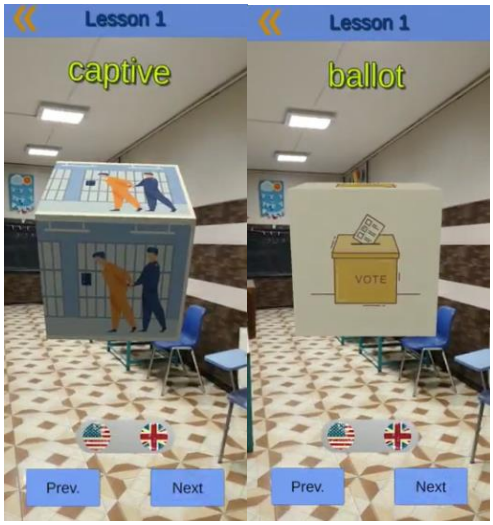

Figure 3: Representation of Vocabularies in AR Environment

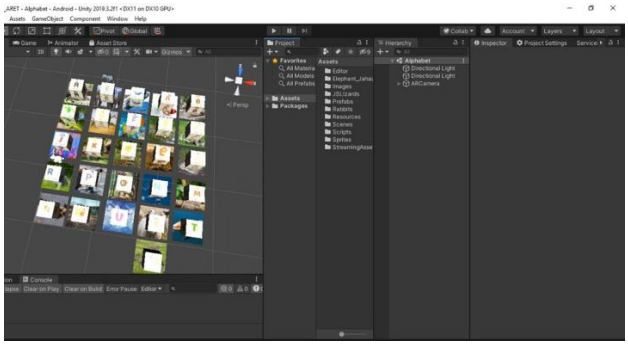

Figure 4: ARET in Unity Software Program (Designing-phase)

Online elite interview

To investigate more understanding about the efficiency of the ARET application and receive faculty members' ideas and views about AR-based learning, a single elite interview by using structured questions was designed. In other words, an elite interviewing method was used to provide general views from experts' points of view because they know the challenges and positive points of subjects better than others (Ary et al., 2018). Subsequently, the researchers of the study started to interview participants of the study who had explored the ARET application in completely online way. This interview has consisted of seven questions in total that maintain the ideas and beliefs about using AR-based learning, and the advantages and disadvantages of it. It should be mentioned that each interview lasted only 15 minutes for each participant. All these questions were asked descriptively. Since participants were non-native speakers of English, they had a choice to answer the interview in their mother tongue (Persian or Turkish) or English.

Table 2. Online Elite Interview Questions

Demographic Questions	Introduce yourself in case of age, teaching experience, degree, and your educational field.
Pre-Interview Questions	Are you familiar with new technologies like AR or VR in education?
Main Interview Questions	Have you faced any problems in case of technical or pedagogical issues during using ARET? How teachers or learners can use ARET for their educational purposes particularly language learning? What are the advantages of using ARET in classrooms or distance education? What are the disadvantages of using ARET in classrooms or distance education? Do you have any suggestions or recommendations for improving ARET in the future?

It should be mentioned that the mentioned questions were asked in online way since the researchers were in two different countries of Iran and Turkey and they have a lack of access for interviewing face-to-face. In other words, the researchers of the study used online elite interviews based on instant messaging applications (E.g. WhatsApp & Skype) or Google Forms. Moreover, some participants of the study were introduced by other participants by using snowball sampling. Therefore, the researchers could contact them and ask about their views toward using ARET for educational purposes. To do so, instant messaging applications were used as communicational platforms for contacting participants and interviewing them.

Data collection procedure

To achieve the views of faculty members' toward using ARET for educational purposes and compare the Turkish and Iranian's views, the following steps were used:

Step 1. To adopt trending technology devices for educational purposes, whether face-to-face classrooms or distance education, the researchers tried to design an AR-based mobile application in the Unity Software Pro version that can be used in smartphones (Android Version). Therefore, by reviewing the literature, they found that AR can be used in the case of teaching essential English vocabulary for both native and non-native learners as the reliable and valid content. Based on this, they used Unity Application Engine to create a platform for presenting AR images of English vocabularies that are collected from 1100 Essential Words for the IELTS book. Subsequently, they named their application as ARET.

Step 2. Since there were controversial views toward using AR-based applications in the literature, the researchers of the study interviewed fifteen faculty members from Anadolu University (Eskişehir, Turkey), Uludağ University (Bursa, Turkey), Islamic Azad University Central and West Tehran branch (Tehran, Iran) through convenient sampling and snowball sampling. In other words, the researchers first had an elite interview with easy-to-access faculty members and then the faculty members introduced other ones who are experts in the field of EduTech. To do this, seven structured questions were asked from these faculty members to provide information about their views toward using ARET. It should be mentioned that they used an online elite interview in instant messaging applications (E.g. WhatsApp & Skype) or Google Forms by written or voice messages.

Step 3. After collecting information and interviewing with participants, the researchers of the study started to transcribe the voice messages from participants and collect the written messages. It should be mentioned that, if the language of participants were Turkish or Farsi/Persian, the researchers translated their speeches.

Step 4. In this step, NVIVO software was used to find the similarities and differences between the faculty members' views toward using ARET for educational purposes in two contexts of Iran and Turkey. In other words, NVIVO clustered the main words, ideas, and concepts from the transcribed elite interviews' responses.

Step 5. The extracted themes and concepts from NVIVO were reported descriptively through using bar charts and reports to compare the faculty members' views toward using ARET in the mentioned countries.

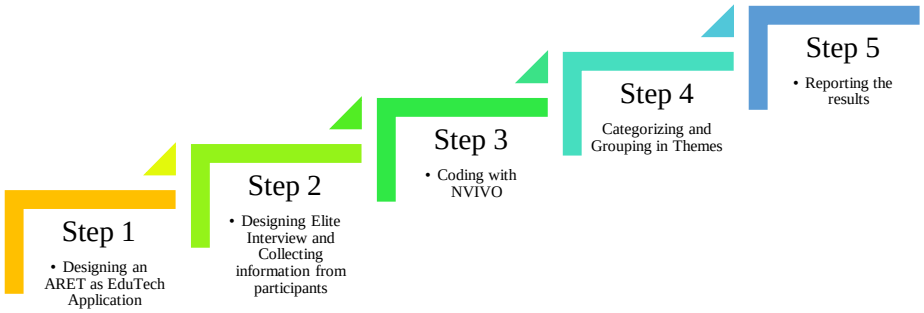

Figure 5: Data Collection Procedure

Data analysis

Content analysis was used as the data analysis tool to similarities and differences between the faculty members' perspectives toward using ARET for educational purposes in two contexts of Iran and Turkey. To do so, the transcription of the interviews was analyzed by NVIVO software to find the main themes in their interviews.

Figure 6: Data Analysis Procedure

RESULTS OF THE STUDY

The results of questions were divided into six sections based on the interview questions as follows.

Demographic background of faculty members

According to the obtained results from the first question of the online elite interview, the faculty members who were participated in the current study had at least a Master's Degree. In other words, the Turkish and Iranian faculty members had Master, Ph.D., and Post.Doc Degrees in different fields of education, engineering, and medicine. The frequency of their educational degrees from Iranian faculty members shows that 13% of them had Master's Degree, 66% of them had Ph.D.

Degree and 13% of them had Post-doc in different fields (See Figure 7.a). On the other hands, the frequency of educational degrees for Turkish faculty members reveals the same situation as Iranian faculty members (See Figure 7.b). It should be mentioned that these participants were fifteen Turkish faculty members from the distance education faculty, education faculty, medical faculty, and economic faculties, and fifteen Iranian faculty members from humanities faculty, and foreign languages faculty (See Figure 8 and 9 for more information).

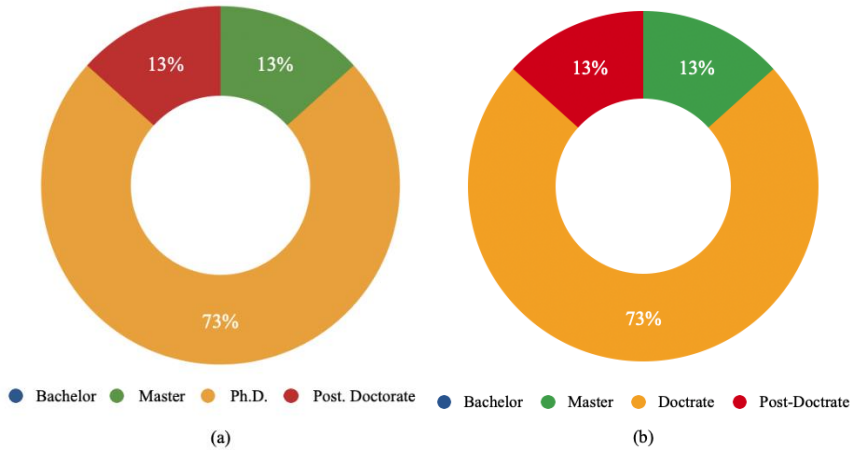

Figure 7: Educational Degrees of Iranian (a) and Turkish Faculty Members (b)

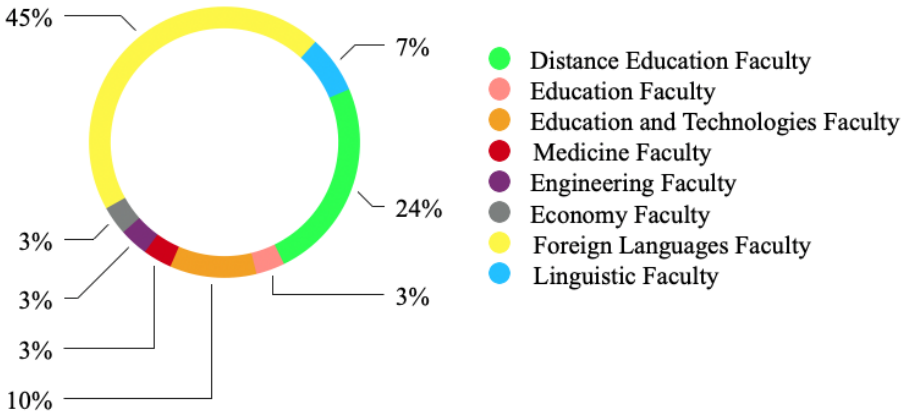

Figure 8: Percentage of Faculty Members' Fields of Study

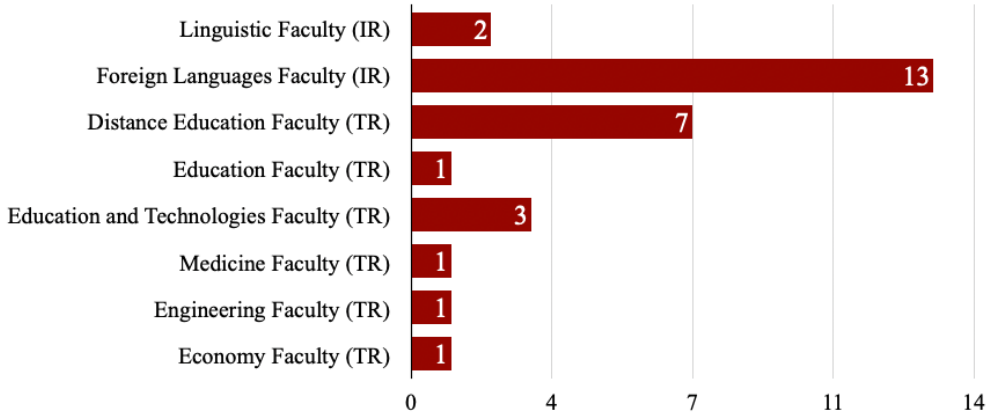

Figure 9: Frequency of Faculty Members' Fields of Study (TR: Turkey, IR: Iran)

Another important element in the demographic background of faculty members was the educational experience because they were supposed to provide pedagogical and technical comments on ARET like an expert. According to the obtained results, Iranian and Turkish faculty members had a minimum of 5 years of experience and a maximum of more than 36 years of experience. Figure 10 shows the details of educational experience among Iranian and Turkish Faculty members.

Figure 10: Educational Experiences of Iranian and Turkish Faculty Members

The last element in the demographic background of faculty members was age. The comparison of age ranges in Figure 11 displays the age ranges of Iranian and Turkish faculty members who participated in this study.

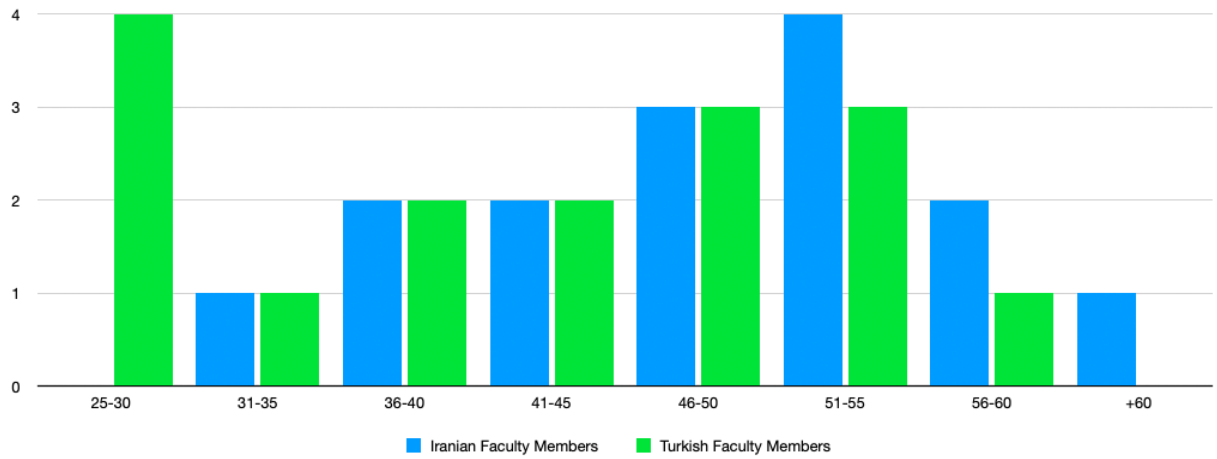

Figure 11: The Age Ranges of Iranian and Turkish Faculty Members

Familiarity of faculty members with AR and VR

According to the second question of the online elite interview which was about the familiarity of Iranian and Turkish faculty members with AR and VR, most of them were familiar with AR and VR and their application in educational fields. More particular, analyzing the participants' answers to this question shows that the responses were in three groups of Yes I know, No I don't know, and I have a little familiarity. As Figure 12 shows, most of the faculty members (Iranian= 12, Turkish= 7) had familiarity with AR and VR and their use for educational purposes. The others faculty members had no or a little familiarity with these new trends in education. To explain it clear the frequency of faculty members with a little familiarity was higher than faculty members without any information about AR and VR.

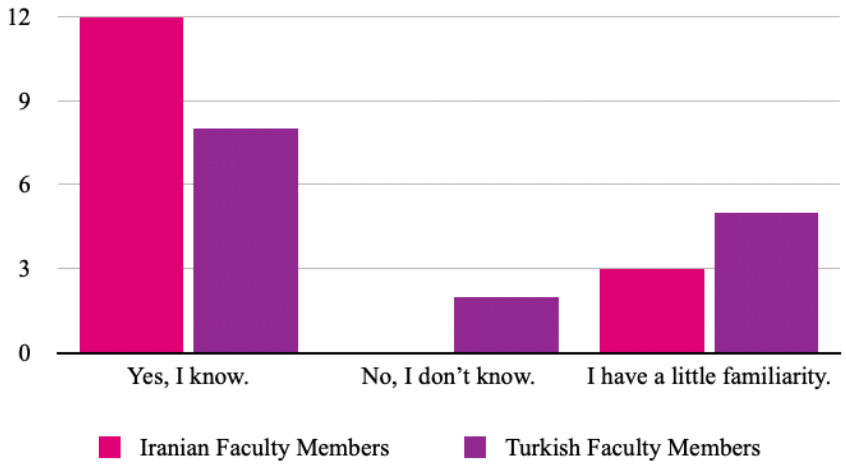

Figure 12: Frequency of Familiarity with AR and VR in Iranian and Turkish Faculty Members

Technical and pedagogical issues in ARET

The third question of the online elite questionnaire was about technical and pedagogical problems that faculty members had faced before or during using ARET as an AR-based application. According to their responses, technical problems refer to any systematic, software, or hardware problem before, during, and after installing ARET in the faculty members' mobile devices. Moreover, pedagogical issues refer to any error or mistake, or even problem in the case of content, examples, or sentences. According to Figure 13 the main important problem was technical issues rather than pedagogical problems. As the interview responses show, five Iranian faculty members and also seven Turkish faculty members had technical problems like the hard way of installing or changing some specific settings to install the application. For example one of the Turkish faculty members answered that; *I had a little hard to install on the phone but I did*. In addition one of the Iranian participants responded that; *In installing it, I had to apply certain settings that were done with your help.* Therefore, although there were some problems in installing the ARET they could handle them. In the case of pedagogical issues, more than 13 faculty members in each group were satisfied with the content, examples, and sentences but there were some suggestions among the answers about the pedagogical issues. For instance, a Turkish faculty member mentioned that; "*ARET is a nice app. there should be more dimensions pedagogically like the grammatical points, speaking*". Therefore, as the findings of the study show, most faculty members (both Iranian and Turkish) were satisfied with the pedagogical content and the only problems were technical problems.

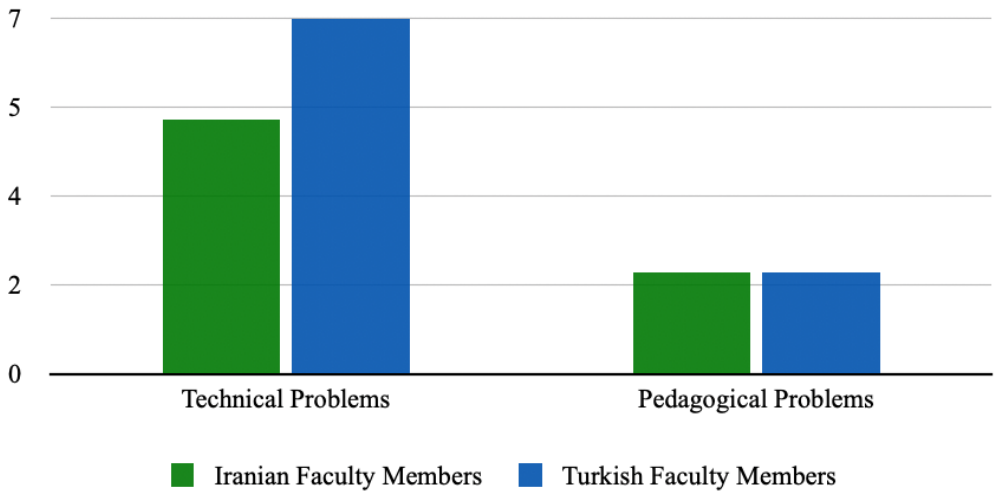

Figure 13: Frequency of Technical and Pedagogical Problem Cases in Iranian and Turkish Faculty Members

ARET's application for teachers and learners

Since ARET is an educational tool based on the AR platform, its applicability and potentiality were very important for the researchers of the study. Therefore, the views of Iranian and Turkish faculty members were investigated through the fourth question. According to the analysis of the

responses in NVIVO software, teachers and learners can benefit from the ARET application in five main areas including educational technology or EduTech, supplementary activity, edutainment, psychological accelerator, and language learning.

More particularly, ARET can be applied as educational technology in face-to-face classrooms and distance learning. In other words, ARET can improve the learners' learning and teachers' teaching in face-to-face classrooms since one of the Turkish participants mentioned "*Teachers can teach with ARET in face-to-face education*" and "*Teachers can open the application in face-to-face classrooms to teach effectively*". Moreover, the code distance learning contained a quote from Iranian participants who identified that "*It can be used in non-classroom situation*". This shows that ARET can be implemented in distance learning to improve the vocabulary skill of learners. In line with this, a Turkish faculty member pointed out that "*this educational tool can be used anywhere especially in distance education*".

Another theme, suggested by NVIVO, is supplementary activity that shows the efficiency of ARET to be used as an AR mobile application that can help learners to do their home works or assignments (See Figure 14). In addition to this, ARET can be practical in edutainment which is the combination of education and entertainment. As one of the Turkish faculty members said "*Teachers can teach very well with fun which is called edutainment*". To emphasize this, one of the Iranian participants said that "*adding entertainment to the learning process will make the learners more involved*".

Furthermore, as the faculty members asserted, ARET can have application in terms of psychological issues and it can work as a psychological accelerator that can engage the learners more and increase their self-efficacy. Finally, the last theme shows (Figure 14) that ARET can be helpful for teachers and learners to learn English vocabularies. Since ARET is an AR mobile application for English vocabulary learning, as the Iranian and Turkish faculty members mentioned, it can remove the language barriers and improve the learners' pronunciation because it contains UK (British) and US (American) accents.

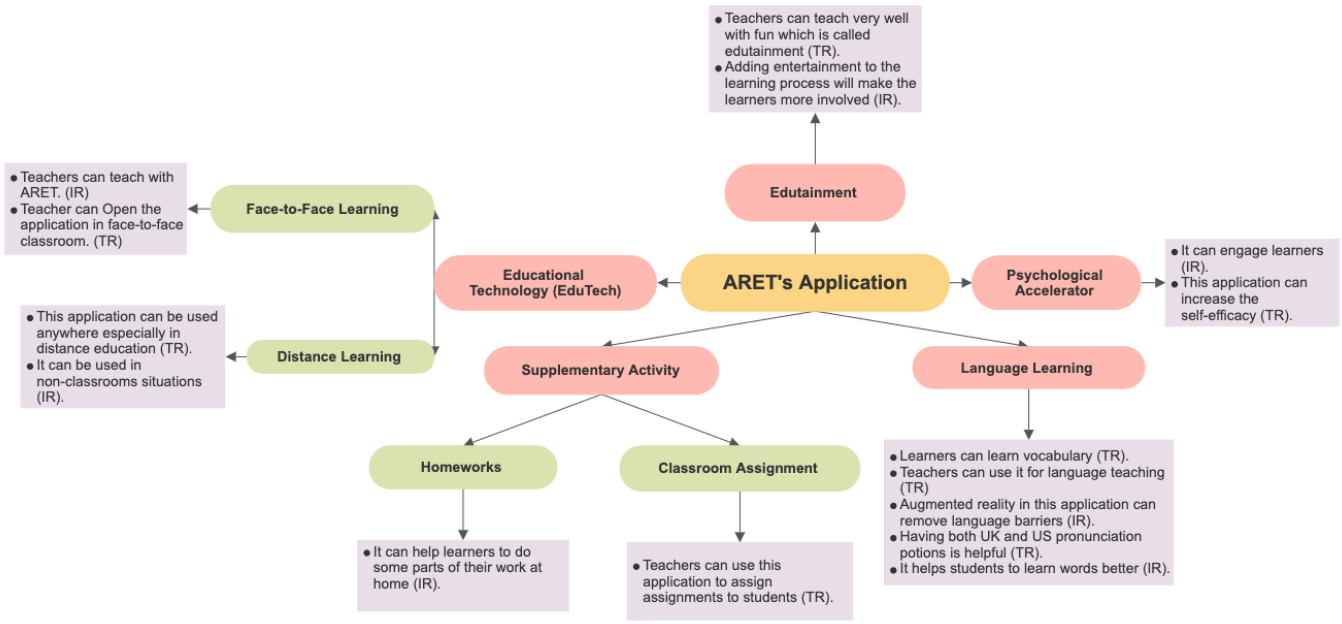

Figure 14: ARET's Application for Teachers and Learners based on NVIVO's Coding (IR refers to Iranian faculty members and TR refers to Turkish faculty members)

Advantages and disadvantages of ARET

In terms of advantages (fifth question), most faculty members believed that ARET can enhance the learners' opportunity to have interaction in classrooms. For instance, one of the Iranian faculty members mentioned that *"I see it's very positive and useful. One of the positive points that comes to my mind is that it can increase interaction between the students and learners."*. In line with this, a Turkish faculty member indicated that *"Due to the high rate of interaction, teacher can explain the topics".* In addition to this, some participants found ARET identified as an application can increase the motivation and interest of students both in face-to-face and in distance education. To indicate this advantage, one Turkish faculty member implied that "*This technology used will increase learners' interest in the learning process. This situation will also positively affect their motivation levels.".* Another Iranian participant had also the same points of view and mentioned "*Any technology in the classroom can increase classroom excitement and help increase student motivation.".* Beyond these advantages, other participants mentioned some factors like innovative teaching and learning, enriching materials and learning experience, increase attention and self-confidence, easy learning and easy access to the application, and also effective and productive learning.

The results of theme analysis based on the NVIVO's coding (Figure 15) reveals that Turkish and Iranian faculty members had similar views in terms of the advantages of ARET. These similar views can be classified into two main categories of technical and classical issues but each of them has some subcategories that can clarify their purposes in the responses. For instance, the first main theme, which is technical issues, is divided into two subcategories of game appearance and programming and technological issues. More specifically, Iranian and Turkish faculty members had similar views in these areas and mentioned that ARET can be considered as an interesting and fun mobile application that can be used fast and cheap anywhere and anytime (See Figure 16 for the sentences which were mentioned by these two groups).

Furthermore, the second main category is classified into two subcategories of game content and psychological issues. In other words, Figure 15 reveals that ARET has some advantages in terms of game content because it has reliable and practical. In addition, Iranian and Turkish faculty members showed that ARET has some advantages in psychological issues since it can draw the attention of learners, increase the learners' motivation, and give a positive attitude to learners.

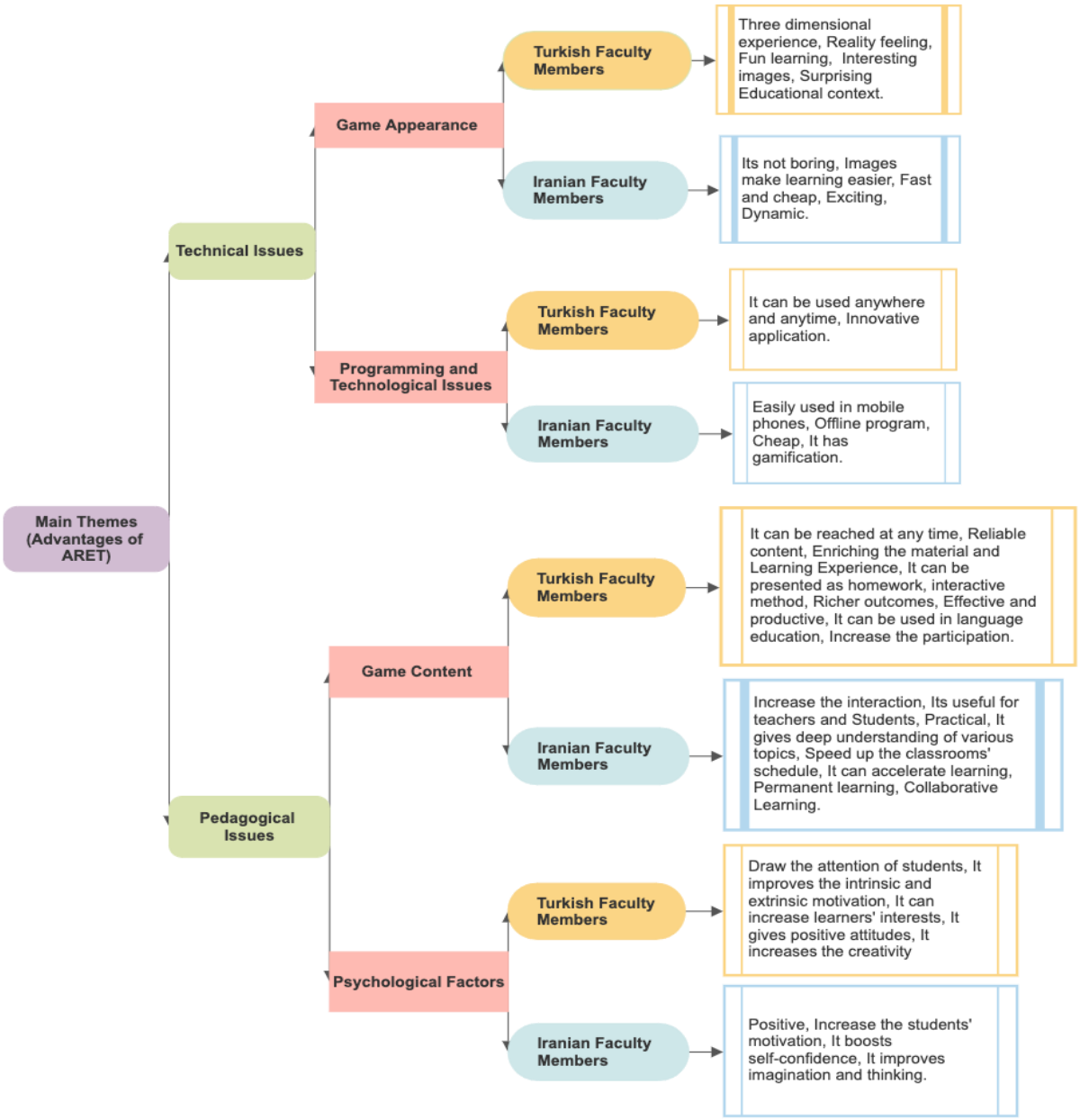

Figure 15: Main Themes of ARET's Advantages based on NVIVO's Coding

In addition to the advantages of ARET in face-to-face or distance educations, ARET had some disadvantages from the Iranian and Turkish faculty members' views (sixth question). As the Figure 16 reveals, ARET can distract learners from education or lessons' goals because most AR applications have gamification in their designing. For example, one of the Iranian faculty members mentioned that *"distraction (lack of concentration) can be considered the most important defect. This is probably the first concern of teachers who criticize the implementation of educational technology in the classroom".* In line with this, a Turkish participant asserted that "*It can be a distracting factor during the lesson. Finally, we will release the mobile tool, the phone or tablet,*

to the student. This may cause a decrease in the student's concentration". In addition to this issue, other participants pointed out that lack of mobile devices can be the disadvantages of ARET because some students don't have mobile or tablets for themselves. To address this issue, a Turkish faculty member said "*Students who do not have technical skills in face-to-face classrooms may become isolated from the classroom by becoming excluded from the classroom".* In addition to this, another Iranian faculty member also included that "*Lack of access to the necessary electronic tools can be considered a disadvantage".* Although some other disadvantages like lack of teacher for asking questions, distracting in cognitive load, or internet problems were mentioned by participants of the study, some participants mentioned that *"There is no disadvantage in face-to-face classrooms, and it is useful in the context of distance education*.".

Therefore, categorizing the NVIVO codes in different themes manifested that ARET can have some disadvantages in three areas like pedagogical issues, technical issues, and psychological issues. Figure 18 displays these three areas in three layers which have some shared parts. To explain it clearly, Iranian and Turkish faculty members have the same views in the shared parts. For instance, both groups mentioned that ARET's disadvantages can be insecure installing, hard downloading in the domain of pedagogical and technical issues and distracting learners and reducing learners' concentration and distracting them in the domain of psychological and pedagogical issues. The remined part of the Figure 16 displays the different ideas and views of these faculty members in Iran and Turkey.

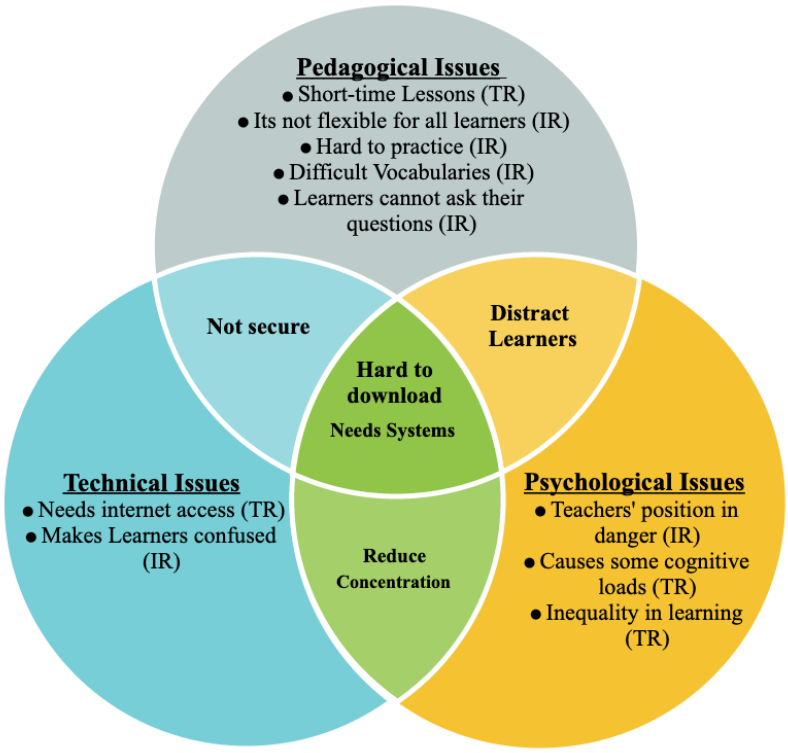

Figure 16: Similarities and Differences in Disadvantages of ARET based on NVIVO's Coding (IR refers to Iranian faculty members and TR refers to Turkish faculty members)

Suggestion for improvement of ARET

The last question of the online elite interview was about suggestion for improving the technical and pedagogical features of ARET as an EduTech for face-to-face and distance education Although some participants didn't have any suggestion for the improvement of this AR application and they were satisfied with the quality of ARET, some Iranian and Turkish faculty members indicated that ARET can be improved in case of using better pictures and animations for language concepts. Regarding this issue, some faculty members indicated that "*Images are simple and can be improved*" or "*The application is nice but looks a bit simple. Pictures can be selected better*".

Furthermore, many Iranian faculty members suggested that further languages can be added to improve the ARET's pedagogical aspects. In this case, ARET can be used for teaching and learning other languages except for English. For example, one of them indicated that "*More spoken languages such as Spanish, German, and the most important languages in the world".*

In addition to this, some faculty members suggested that U-learning or artificial intelligence can improve the technical and pedagogical features of ARET to make it more useful for face-to-face or distance learning. For instance, one of the Turkish faculty members said that "*U-learning or artificial intelligence can be included in this technology. In this way, the learner is encouraged to learn"* which is in line with the points of view of Iranian language learner who said, "*AI can be used to improve the game".*

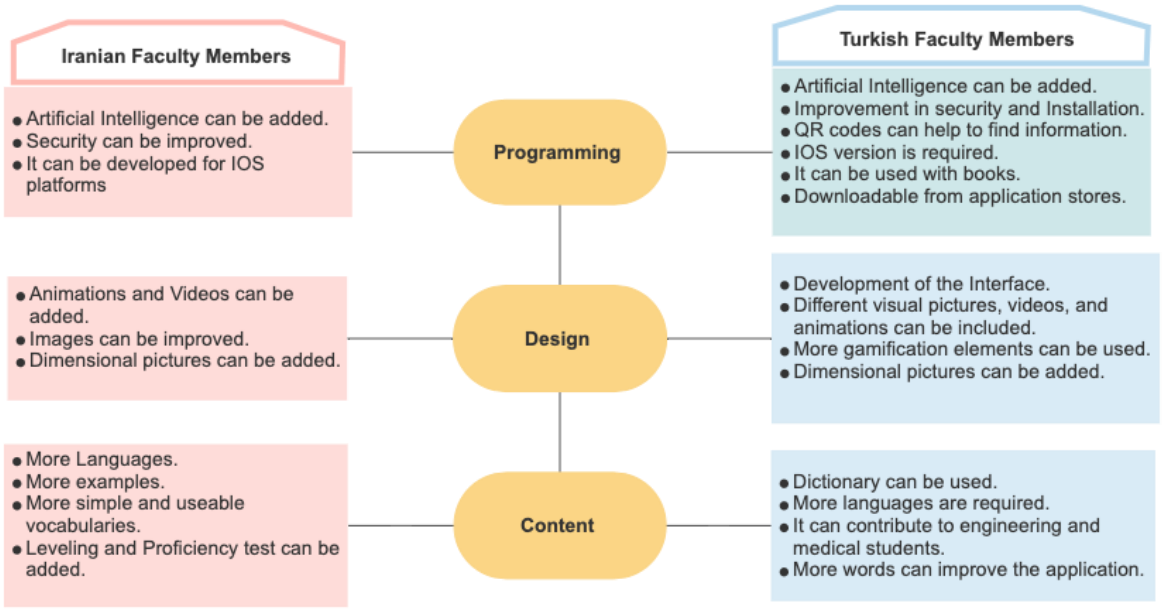

Figure 17: Main Themes for Suggestion for the improvement based on NVIVO's coding

Theme analysis of the suggestion for the improvement of ARET showed that Iranian and Turkish faculty members had the same ideas in terms of programming, design, and content. As the Figure 20 shows both Iranian and Turkish faculty members mentioned that ARET can be improved by adding artificial intelligence and improving its security. Moreover, both groups of participants mentioned that ARET can be designed in IOS platforms for students and teachers who use this platform on their mobile phones.

In addition, both groups mentioned that more animations, videos, and graphical designs can be added to make ARET more interesting and practical. Other suggestions like adding gamification elements and dimensional pictures are also mentioned which is classified in the design theme. Furthermore, the content theme emphasizes the content-based suggestions which include more languages, more examples, and dictionaries.

DISCUSSION ON FINDINGS

This study tried to investigate of Iranian and Turkish faculty members' views toward using ARET as an AR mobile application for teaching and learning English essential vocabularies in face-to-face and distance education. To do this, the researchers of the study have explored Iranian and Turkish faculty members' ideas and thoughts through online elite interviewing which included seven practical questions. According to the results, faculty members' views can be classified into three classifications including technical and pedagogical issues, advantages and disadvantages, and suggestions for improvement (See Figure 18 for more information).

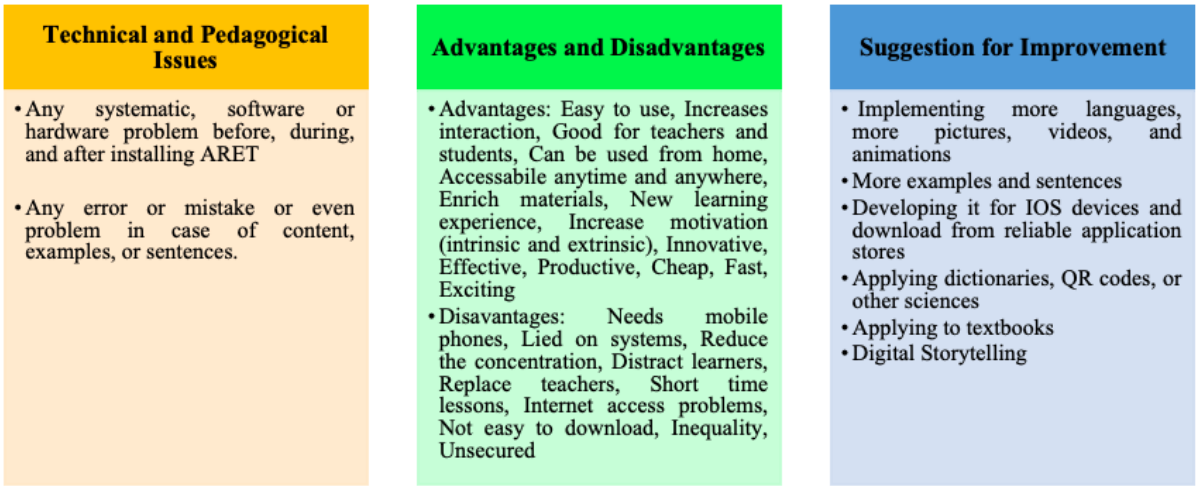

Figure 18: Categorization of Iranian and Turkish Faculty Members' Responses (NVIVO Codes)

Each of these classifications contains more specific information that are gathered from the Iranian and Turkish faculty members' responses. For instance, classification of technical and pedagogical issues shows that ARET suffers from technical issues like insecure installation and some technical bugs more than pedagogical issues. It means that ARET has good content, examples, or sentences to teach vocabularies from faculty members' points of view and learners can benefit from its' advantages in face-to-face or distance education. Subsequently, the second classification which shows the advantages and disadvantages of implanting ARET for educational purposes reveals that ARET can be considered as an innovative application for making learning and teaching more effective and efficient for educational beneficiaries. Although Iranian and Turkish faculty members mentioned that ARET has some disadvantages like distraction, lack of

access to mobile phones, short time lessons, and inequality in education, it can provide an opportunity for interactive learning to increase the intrinsic and extrinsic motivation of learners. To remove its advantages and improve the quality of ARET as an EduTech, some suggestions and recommendations were suggested by Iranian and Turkish faculty members in the third classification. For example, these experts suggested that ARET can be improved in case of providing more and better AR graphical pictures and videos to display the vocabularies. Furthermore, leveling procedures, more languages, and also artificial intelligence can be implied in designing procedures to make them more effective and comprehensive.

Therefore, as the findings of the study showed, there are still controversial views toward using AR-mobile applications in face-to-face and distance education among Iranian and Turkish faculty members. Since these AR-mobile applications in particular ARET are new in education, the results of the study should be compared and contrasted with other studies in the related literature to increase its' validity and reliability. Subsequently, the findings of this study can be in line with previous studies. More particular, the results of this study are in line with the previous research like Altinpulluk (2019) and Koutromanos and Mavromatidou (2021) which mentioned that AR environments can enhance the learning achievement and motivation among the learners. As the Iranian and Turkish faculty members noticed that ARET can increase the learning experience and external and internal motivation of learners, this study is consistent with the results of the mentioned studies. On the other hand, the results of the study can be inconsistent with previous studies like Solak and Cakir (2014) mentioned that AR applications can increase the concentration of learners in education since the faculty members identified ARET as an AR application which can cause some distraction among learners. Moreover, the results of the study which emphasized on the psychological accelerator of ARET for motivating learners and engaging them in learning can be in line with the studies like Fan, Antle, and Warren (2020), Mahadzir and Phung, (2013), and Khoshnevisan and Lee (2018).

Moreover, the results of the study are in line with the studies like Bujak et al. (2013) and Lasica, Meletiou-Mavrotheris, and Karzis (2020) which claimed that AR-applications can be used as a classroom activity or homework for learners because they are fun and easy to access. Since Iranian and Turkish faculty members noticed that ARET can be used in the face-to-face classroom and distance education for engaging learners in-class activities and in-home practices, this study is consistent with these studies. Moreover, studies like Bujak et al. (2013) and Dunleavy and Dede (2014) can prove the results of the current study which claimed that AR-based applications can play the role of supplementary activity in education.

In addition to this, most of the faculty members whether Iranian or Turkish identified ARET as an AR application that can be used any time and everywhere. Based on this, the results of the study can be in line with the study of Khatoony and Nezhadmehr (2020) who manifested that integration of technology and education can provide efficient and productive learning and teaching in every place for all ranges of people. According to the views of Iranian and Turkish faculty members, ARET has some advantages like enriching the materials and content of the study which are mentioned by previous studies like Altinpulluk, Kesim, and Kurubacak (2020) and Saundarajan et al. (2020).

It should be mentioned that Iranian and Turkish faculty members also mentioned the point that AR applications cannot be accessible for many learners because they may not have access to mobile devices. This point is in line with the findings of the study of Khatoony and Nezhadmehr (2020) who identified that many teachers especially in under-developing countries may consider

AR or new technological teaching materials as expensive or useless materials because they believe that providing technological facilities is not easy for many learners or educational institutes.

CONCLUSION AND IMPLICATIONS

The transformational shift from the traditional way of teaching and learning has been changed to a technological-based approach in educational fields with the advancement of computer sciences. In other words, computer sciences have provided lots of improvement in educational technologies especially in creating new environments such as AR environments where learners can enrich the real context by adding extra features through opening their mobiles' cameras. Therefore, AR-based applications could introduce the new experience of teaching and learn for teachers and learners in face-to-face and distance education which confront controversial views among educational beneficiaries. To explore and identify the efficacy of AR-based applications concerning previous approaches such as CALL, MALL, and ARAL, the researchers of the study have developed an AR application for learning and teaching 1100 essential vocabularies for IELTS named as ARET which can be applied in both face-to-face and distance education.

According to controversial views among education beneficiaries, this study explored the ideas and thoughts of thirty faculty members from Iran and Turkey through online elite interviews. The results of the study showed that the major problem of ARET was a technical problem in the case of unsecured installing. Moreover, the results of the study showed that most faculty members from Turkey and Iran were satisfied with the pedagogical issues-particularly its content, examples, and sentences and they had such suggestions for its improvement. For instance, they mentioned that AR graphical pictures can be improved more and videos can be added to display the vocabularies. Additionally, leveling procedure for checking the proficiency of the learners, more languages, and also artificial intelligence can be added to this application to improve the quality of learning and teaching in both face-to-face and distance education. Even though Iranian and Turkish learners mentioned some disadvantages of implementing ARET like a distraction, lack of access to mobile phones, short time lessons, and inequality in education, most of them identified ARET as an effective application for making learning and teaching more effective and efficient. In this regard, Iranian and Turkish faculty members mentioned that ARET can provide an opportunity for interactive learning to increase the intrinsic and extrinsic motivation of learners. Furthermore, ARET can have the potential to enrich the materials and positive environment for having a different experience of learning and teaching.

The findings of the current study could be advantageous for some stakeholders and beneficiaries. Firstly, university professors and teachers can benefit from the findings of the present study to provide their students with different recent AR-based applications such as ARET for educational purposes. Also, teacher educators can be the beneficiaries of the present study and draw upon its findings to be aware of the advantages of AR applications and other EduTech in face-to-face or distance learning. The teacher educators can incorporate the findings of the current study into in-service and pre-service courses and make teachers informed of how using AR applications like ARET can help them not only save more time but also enhance the efficiency of sessions. Moreover, textbook developers, material designers, and game developers can also take advantage of the present study to design AR applications and ask their users to encourage teachers and learners to benefit from AR devices. Last but not the least, the findings of the current study

could be beneficial for learners since they can devote some time to working on their educational goals by using ARET or other AR applications. That is, instead of using traditional methods of teaching, students can implement ARET or AR applications as valuable learning tools which open up precious learning opportunities. In this way, they can learn not only from their teachers but also from their mobile phones.

LIMITATIONS OF THE STUDY

This study, like other studies in the fields of educational research, had comprised some limitations that have limited the generalization of the results. These restrictions are generally due to external factors which may affect the quality of the findings and results. So, this study had several limitations that need to be taken into consideration when making generalizations about the findings. The first and foremost limitation of this study was the lack of access to the large population for having more reliable and valid findings. Secondly, this study has faced another limitation which was the lack of accessibility to IOS mobile platforms which was mentioned by many participants in the study. Because of the technical issues, the researchers of the study couldn't provide an IOS version of ARET. Finally, ARET application is limited to teaching and learning English vocabularies. According to these limitations, following suggestions are recommended in the next section.

SUGGESTIONS FOR FURTHER RESEARCH

In order to improve the quality of the research, following suggestions are recommended by the researchers of the study. Although the responses from the Anadolu University, Uludağ University, Islamic Azad University Central and West Tehran branch faculty members could reflect the main information about advantages and disadvantages of using ARET as an EduTech, more faculty members from other countries especially native countries can improve the results of the study. Moreover, other studies can be done in this field by comparing and contrasting learners' points of view through adopting focus groups or experimental designs. Additionally, more studies can focus on other skills (such as reading, writing, listening, and speaking) and components (such as pronunciation, grammar, culture, etc.) of language.

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