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Student name: Sara Razaghi

Student number: S3460967

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Date: 15<sup>th</sup> April 2022

**TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY**

**Towards MAPT-Integrated Pronunciation Proficiency-  
English Pronunciation Proficiency beyond Language Classroom  
through a Task-Based Mobile Application: The Iranian Case**

Sara Razaghi

S3460967

MA in Applied Linguistics  
Faculty of Applied Linguistics  
University of Groningen

Supervisors:

Dr Sake Jager

Dr Rasmus G.A. Steinkrauss

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**TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY****List of Abbreviations**

CALL	Computer-Assisted Language Learning
CAPT	Computer-Assisted Pronunciation Teaching
CEFR	Common European Framework of Reference
CDST	Complex Dynamic Systems Theory
CSM	Careful Speech Model
EFL	English as a foreign language
FL	foreign language
ICC	intraclass correlation coefficient
L1	first language
L2	second language
MAPT	Mobile-Assisted Pronunciation Training
TBLT	Task-Based Language Teaching
VPN	virtual private network

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### Abstract

Several studies have continuously reported the unsatisfactory level of pronunciation proficiency and the mispronunciation of absent consonants of English in the Persian language among Iranian EFL learners. This study sought to investigate whether using a pronunciation training mobile app, which is task-based, prompts pronunciation accuracy and intelligibility for reported consonants. Moreover, the study aimed to understand the correlation between motivation factors for pronunciation learning and the use of these apps among intermediate learners. To this end, twenty students in a public Technical and Vocational University for girls in Tehran used a task-based pronunciation training app (i.e., *articulate.xyz*). Implications suggest that task-based mobile pronunciation training tools can effectively improve pronunciation accuracy; however, the intelligibility of utterances seemed to be affected by participants' initial differences rather than the treatment in this study. Moreover, the findings revealed the high level of motivation and potential benefit of using such tools as an out-of-class activity to fill the gap for increasing pronunciation accuracy and learners' autonomy through enriching EFL classes with reliable tools and technologies.

**Keywords:** pronunciation accuracy, intelligibility improvement, Task-based mobile-assisted pronunciation training tools, motivation for pronunciation learning, motivation for using mobile-assisted pronunciation training tools

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### 1. Introduction

Although the acquisition of the sound system of English-as-a-foreign-language (EFL) is naturally affected by social, psychological, and cognitive aspects of learners' attitudes, the ultimate attainment of effective oral communication can be achieved through authentic and intelligible pronunciation. English is broadly used as the common language of international communication (Michaud & Colpitts, 2015) and the global lingua franca to conduct business (Derwing, 2008). Consequently, speech intelligibility is regarded as a crucial social skill. This means that a foreign accent might cause speech to deviate far from a listener. Hence, noting the first language (L1) and the second language (L2) phonological distance, meeting individuals' requirements in the complex process of EFL pronunciation training/learning becomes more demanding.

While several studies have proved the efficacy of pronunciation training for EFL learning (Derwing & Munro, 2005), pronunciation instruction is easily underestimated and rarely paid enough attention in this context. Pronunciation instruction has been discussed from two perspectives: efficient integration of pronunciation training into classroom instruction and transferring oral production skills to the authentic communicative situation (Acton et al., 2013). In this regard, teachers' awareness of "students' own perceived pronunciation goals" (Derwing, 2008:348), besides providing individual feedback wherever possible (Derwing & Murray, 2015), can contribute to enhancing successful oral communication.

Additionally, recent studies have proved that task-based instruction can prompt L2 pronunciation learning (Gurzynski-Weiss et al., 2017). Due to developing more interaction and negotiation of meaning (Loewen and Isbell, 2017; Solon et al., 2017), while perception and production of pronunciation features are progressed (Mora and Levkina, 2017), the

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combination of form-focussed and meaning-focused instruction can intensify pronunciation instruction (Celce-Murcia et al., 2010; Saito and Saito, 2017). Thus, as Darcy et al. (2019) argued, the integration of form-focused instruction with communicative tasks allows genuine communicative pressure for real-life interaction.

Several recent studies have reported that L2 pronunciation instruction has been neglected in Iran (Nosratinia & Zaker, 2014; Purhosein Gilakjani et al., 2020). Based on recent inductive studies, most Iranian EFL learners are facing challenges concerning mispronunciation of absent sounds of English in the Persian language (/w/, /θ/, /ð/, /ɔ/, /ɪ/) with those similar in Persian. Moreover, while some students have problems replacing short vowels with long vowels, others have problems producing diphthongs and consonant clusters (Mirhassani, 2003; Nosratinia & Zaker, 2014; Ajabshir, 2018). This can be addressed through “evidence that late L2 learners tend to (over) rely on the categorical mode of perception and thus to perceived L2 sounds in terms of firmly established L1 phonetic categories” (de Bot et al., 2005: 191). Here, as de Bot et al. (2005) indicated, intensive perceptual training focusing on “subtle phonetic contrasts between the speech sounds of the target language and those of their L1” (p. 191) as well as *input enhancement through instruction* (Bongaerts et al., 1997) could improve the learning process. Such a problem calls for explicit pronunciation instruction and continued access to an authentic L2 input training source that provides authentic communicative oral situations for more practice.

When it comes to pronunciation proficiency in countries that exhibit immense linguistic variations, such as Iran, on the one hand, English pronunciation learning might be consciously or unconsciously wildly impacted due to dynamic background languages. On the other hand, English pronunciation is mainly a teacher-dependent and taught education. Meanwhile, the proficiency levels of English teachers’ pronunciation knowledge are not

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guaranteed. Moreover, due to little chance for meeting English-speaking people or finding English-speaking settings outside the learning context of the classroom in Iran, it is nearly impossible to pick up an authentic pronunciation through everyday communication in society. As such, the learners' primary input source is merely through the classroom context, besides listening or speaking on their own. Consequently, the observed gap and manifested various displayed accents of Iranian EFL learners demand serious consideration of enriching EFL classes with reliable tools, innovative methods, and technologies for pronunciation training.

Much is yet unknown about the complexity of using technology to process oral language perception and production. However, integration of reliable sources of pronunciation training, such as Mobile-Assisted-Pronunciation-Training (MAPT)-tools, may serve the learners for providing immediate, reliable feedback and increase learners' autonomy without direct supervision of the teacher. Unfortunately, despite the recent proliferation of MAPT-tools, pronunciation development via mobile phone apps has not been well-tracked in the Iranian context. In this regard, the present study investigates if pronunciation accuracy and intelligibility could be enhanced by using a task-based-language-teaching (TBLT) MAPT-tool in terms of challenging consonants in the Iranian EFL learning context. Moreover, the correlation between students' motivation factors for their pronunciation learning and MAPT-tools are studied in a motivation survey. Consequently, the subjects in the study used a TBLT MAPT-tool for pronunciation development outside the classroom. Then, three raters judged subjects' oral productions for speech accuracy and intelligibility concerning two challenging consonants (/w/, /θ/), and the researcher conducted an online motivation survey.

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### 2. Literature

#### 2.1. Pronunciation Instruction

The importance of pronunciation instruction and its positive effect is manifested in several linguistic studies (Celce-Murcia et al., 1996, Rossiter et al., 2010; Ha, 2013). Cook (1996), cited by Pourhosein Gilakjani (2016), defined pronunciation as the production of English sounds. Pronunciation instruction has been often neglected in the English teaching area (Tergujeff, 2013), even though pronunciation was regarded as a means in the language learning domain during the 1800s and early 1900s (Ketabi & Saeb 2015: 182). Despite historical ups and downs in pronunciation instruction, pronunciation training is considered a regular component of Communicative Language Teaching (Celce-Murcia, 2001). Because pronunciation training sometimes involves incorporating pronunciation correction to increase attention to authentic pronunciation, providing learners access to communicative English pronunciation instruction can affect pronunciation correction. Moreover, communicative classroom activities would motivate learners to practice oral skills (Sadeghi & Richards, 2015). Indeed, learners who receive pronunciation instruction outperform those who do not (Lee et al., 2015).

Regarding L1 and L2 phonological distance and similarities, pronunciation is considered as one of the most challenging skills to be acquired (Aliaga García, 2007) due to consisting of “most language behaviour” including speaking and listening (Cutler, 1995:98). L2 pronunciation acquisition can be considered from two viewpoints: segmental and suprasegmental (Darcy, 2018; Saito & Saito, 2017; Foote et al., 2016; Mirza, 2015; Munro & Derwing, 2015; Deterding, 2015; Thomson & Derwing, 2015; Zielinski, 2015). The segmental viewpoint contributes to decoding individual sounds as the minimal sound unit within syllables. At the same time, suprasegmental phonology is associated with general articulatory features of intonations patterns, stress placement, and rhythm in speech. This

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means while the first viewpoint exhibits the segmental accuracy in pronouncing words and demonstrating native-like speech (accuracy), the latter form is used more in decoding the melody of spoken language and perceived ease of comprehensibility (intelligibility).

Pronunciation instruction is mainly viewed through three approaches, including the intuitive-imitative approach, the analytic-linguistic approach, and the integrative approach (Celce-Murcia et al., 1996; Chen, 2007) that integrate traditional methods with modern techniques. This study aims to take pronunciation instruction into account based on the integrative approach. According to the integrative approach, pronunciation is considered an integral part of communication, beyond the isolated drills and subskills, to introduce and practice pronunciation through meaningful task-based activities that enrich the learning environment with supra-segmental features. This requires a dual-focused oral communication program (Morely, 1994) to hold micro-level instruction focusing on linguistic competence, practicing segmental and suprasegmental features, and macro-level focusing on more global factors involved with communication and using language for communicative purposes. Accordingly, as cited by Arashnia & Shahrokhi (2016), Chen (2007) argues that the latter approach primarily focuses on speech intelligibility required for effective communication. Noting the superiority of the global goal of intelligibility and a comprehensible pronunciation over placing too much focus on individual segments, not only is the integrative approach a proper basis for providing explicit input for pronunciation accuracy development in meaningful task-based activities, but it also is an asset for increasing the level of intelligibility with supra-segmental features through communicative task cycles considered in the present study according to the Iranian EFL context.

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### 2.1.1. Pronunciation Instruction from TBLT Perspective

Previous studies have demonstrated the effect of meaning-based task instruction on pronunciation development (e.g., de la Fuente, 2006; de Ridder et al., 2007; Ellis et al., 2001; Loewen, 2005; Gordon, 2021). The central component of the task-based framework is focusing on the form within the meaning or within communicative tasks (Ellis, 2003; Long, 2015; Long & Norris, 2000; Robinson, 2001; Skehan, 1998). Manipulation of task-based features focuses learners' attention on target forms in a meaning-based interaction. As such, automatization and L2 development are encouraged by providing conditions for cognitive processes and social interactions that facilitate L2 learning (e.g., Long, 2015; Robinson, 2011; Skehan, 2014).

TBLT is a general label for “any number of realizations that underscore language production and analysis of meaning through real-world activities, collaborations, problem-solving or information- gap activities” (Blake, 2017:111). Subsequently, carefully designed communicative tasks can contribute to enhancing pronunciation. Indeed, communicative pronunciation-focused tasks can increase the probability of paying attention to “particular aspects of the language code in the context of a meaningful activity” (Ellis, 2003: 9). Here, it is possible to define specific pronunciation tasks to help students set feasible goals. For instance, introduced tasks in the sequence of a task cycle could promote awareness of authentic pronunciation characteristics in a communicative context. Thus, TBLT could contribute to achieving specific pronunciation goals through designing communicative tasks.

Additionally, tasks can contribute to L2 pronunciation accuracy by increasing the chance of noticing the gap between a learners' output compared with the provided input while displaying “the metalinguistic reflection in the form of output” (Robinson, 2011:2). In other words, TBLT could offer more opportunities for pronunciation-focused recasts by inviting the

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students to give feedback in the form of recasts or get them involved in natural conditions for recasts during task-based interactions and communicative tasks. Subsequently, the learning activities create a balance between form and meaning rather than focus on forms (i.e., presenting grammar points to be synthesized by the learner for communication) (Long, 2015) to affect individuals' language systems. Therefore, the pronunciation instruction is prompted through the combination of form-focused instruction as well as a "*workplan* whose primary focus is on meaning and in which learners have to rely on their own linguistic resources for completion" in task-based interaction (Gordon, 2021:96).

Explicit instruction helps L2 learners to develop their pronunciation skills (Lee et al., 2015), especially through increasing their awareness of phonetic and phonological characteristics of L2, or differences between their L1 and L2 (Kennedy and Trofimovich, 2010). Following this, "explicit pronunciation instruction that balances a focus on form and meaning" (Gordon, 2021, p. 95) promotes pronunciation skills effectively. As Gordon (2021) argued, those tasks designed to develop the use of learned forms through explicit instruction could promote authentic interaction and negotiation of meaning for promoting communication. Thus, task-based teaching and explicit communicative instructions could improve speech accuracy and intelligibility.

### 2.1.2. Pronunciation Instruction from a Dynamic Perspective

From a Complex Dynamic System Theory perspective (e.g., van Geert, 2008; Spoelman and Verspoor, 2010; Verspoor et al., 2017; Larsen-Freeman, 2018, 2019), individuals' language systems change "due to a complex interaction of a wide range of factors" (de Bot et al., 2005:16). "If we assume that language is a complex adaptive system"; consequently, "teaching and learning is a dynamic process" (Verspoor, 2017:143). Indeed,

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since being affected by continuous mutual interactions of variables, the complex L2 learning, and development system has been valued as a dynamic system.

Accordingly, the theoretical perspective of Dynamic Systems Theory (DST) -applied to EFL learning (Larsen-Freeman, 1997, 2014, 2015, 2017; Cameron, 2003; Larsen-Freeman & Cameron, 2008; de Bot, 2017, 2008; de Bot et al., 2005; de Bot et al., 2013; Lowie, 2017; Lowie & Verspoor, 2019; 2015)- can best suit to phonological development, pronunciation proficiency and pronunciation instruction (Lima & Alves, 2019) provided in the classroom context. Based on an empirical study, Lima and Alves (2019) have concluded that DST studies the “complex, dynamic, non-linear, self-organizing, open, emergent, sometimes chaotic, and adaptive behavior of language and its development” (p.29). Subsequently, L2 pronunciation development and instruction not only could be considered dynamic but also the “power of explicit pronunciation teaching” (p. 44) and pronunciation instruction integration to the classroom should be noted in this regard.

### 2.2. Pronunciation Instruction in Iran

Notwithstanding, previous studies revealed that pronunciation instruction is granted the least attention for Iranian EFL learners (Pourhosein Gilakjani & Ahmadi, 2011). In addition to a lack of meaningful and repetitive practice, many EFL classes ignore explicit tasks and focus on pronunciation development skills.

Based on a survey study focusing on factors influencing Iranian EFL learners' English pronunciation learning, Pourhesin Gilakjani et al. (2020) concluded that learners' social identity and L1 had considerable effects on L2 pronunciation learning. Iran is divided into 31 provinces with a rich diversity of ethnolinguistic out-groups with 86 mother tongues and dialects (Eberhrad et al., 2021), including Azeri, Kurdish, Lurish, Arabic, Pashto, Balochi, Caspian, Semnani, Talysh, among other languages, rather than Persian, considered as the

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authorized and formal language of the country. Subsequently, this might cause crucial differences regarding learners' social identity and L2 pronunciation learning potentials. Therefore, there is a call to increase learners' pronunciation proficiency and autonomy in pedagogical designs to promote EFL learning in Iran.

To the best of the author's knowledge, English language learning pedagogy in most public higher education centers -rather than the private language institutions- is dominated by the "Careful Speech Model" (CSM) (Cauldwell, 2014) in Iran. CSM mainly focuses on citation forms of words as the key components, the grammatical categories, and the rules of connected speech which are joined together and placed in clauses and sentences. However, taking active steps to enhance learners' confidence in L2 communication and promoting individuals' skills requires more than directing students' attention to CSM. In addition, some EFL teachers may not have enough experience distinguishing CSM and teaching *phonology for listening* (Rixon, 2014:296) and *streaming speech* (Cauldwell, 2003) in rapid spontaneous speech. Consequently, when it comes to instruction of certain aspects of pronunciation, a descriptive model which allows integration of specific tasks for pronunciation instruction to aspects of language use could be more effective than the CSM model in the classroom. While explicit instruction could enhance accuracy and intelligibility, the Iranian EFL learners could benefit from integrating specific meaning-based tasks within the framework of TBLT.

### 2.3. Factors Affecting Pronunciation Instruction

#### 2.3.1. Nativeness vs. Integrativeness

Pronunciation instruction is mainly affected by two approaches: the Nativeness Principle and the Intelligibility Principle (Levis, 2005). While the Nativeness Principle refers to achieving accuracy and native-like pronunciation, the Intelligibility Principle refers to comprehensibility. Levis (2005) argued for "superiority of the Intelligibility Principle

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regarding where pronunciation fits within the wider field of language teaching” (p. 310) and believes the “Nativeness Principle applies poorly to the reality of English use” (p. 320). Morley (1991) considered intelligible pronunciation the necessary part of communicative competence. Kenworthy (1987) believes that intelligible pronunciation is the degree of being understood by a listener. Indeed, speech intelligibility “affects both listening and speaking in every communicative context” (Levis, 2020:10). Therefore, the ultimate aim of English pronunciation training could be intelligibility.

However, accurate and authentic production of the sounds of a language in the communication process assists comprehensible communication (Fraser, 2000). Accuracy is as vital as the correct application of grammatical principles or syntactic rules (Tanner, 2012) and intelligibility. The lack of perfect pronunciation skills would impact effective communication when heavily accented. This means learners with a foreign accent could be considered unintelligible in a way to be misunderstood or be partly intelligible in the sense that understanding them requires more effort (Derwing & Munro, 2005). Furthermore, foreign-accented speakers are associated with lower “status” (Bresnahan et al., 2001) or less truthful (Lev-Ari & Keysar, 2010). Munro (1998) referred to the foreign accent as “a non-pathological speech that differs in partially systematic ways from the speech characteristics of the native speaker of a given dialect”. To sum, the interaction between L2 speakers’ production and listeners’ perception forms the focus of attention according to accentedness, intelligibility, and comprehensibility research (Reed & Levis, 2015). Thus, it is essential to note that even if a speaker has good grammar and vocabulary, lack of accuracy and a strong foreign accent may hinder being understood (Lord, 2005).

Accordingly, the level of production that people understand the speaker’s English as an acceptable speaker to be heard is called comfortable intelligibility (Scovel, 1988).

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Considering that understandable pronunciation leads to functional intelligibility, functional communicability, and increased self-confidence (Morley, 1991), it is suggested that learners' accents be close to a standard variety (Pourhosein Gilakjani, 2016). However, individuals' accents might be influenced by many aspects of ones' language systems. As Avery and Ehrlich (1987) indicated, the learner's L1 identifies the nature of a foreign accent. Consequently, intelligible pronunciation is considered the crucial component of oral communication -just like the other language components- but it should also be taught as part of an integrated, interdependent system that provides the opportunity for learning authentic and accurate speech.

However, because of the flexibility of human listeners (Scharenborg, 2007) in communication, intelligibility includes more than pronunciation (Jenkins, 2000). While suprasegmental features such as prominence placement make comprehension difficult (Hahn, 2004), other stresses and intonational features do not affect understanding similarly as suprasegmental features (Levis, 1999). Previous research has indicated that not all pronunciation errors contribute equally to the intelligibility of non-native speech (Loukina et al., 2015). Therefore, this study considered accuracy at the word level and intelligibility at the sentence utterance level. Here, the connection between accuracy -according to authentic pronunciation-and intelligibility -according to the extent to which accuracy might affect speech intelligibility- is regarded.

### **2.3.2. L1/L2 Segmental Phonological Distance**

Research on EFL learning has proved the interference and interaction of language transfer in shaping target language phonological systems. Indeed, language transfer could affect segmental pronunciation learning and instruction. As de Bot et al. (2005) has stated, there is a cross-linguistic influence in case "the L1 and L2 are just two of the many different

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variables of the same system” according to the dynamic system (p. 38). Subsequently, individual EFL learners are prone to transfer some L1 features into L2 either consciously or unconsciously (Nosratinia & Zaker, 2014). Therefore, both L1 and L2 phonemic inventories’ shared segments create noticeable production difficulties (Chan, 2021).

In pronunciation teaching literature, several studies note the importance of L1 and L2 contrastive analysis techniques for teaching pronunciation (Arroyo Hernández, 2009; Hammerly, 1982). Also, some authors believe that L2 learners will acquire appropriate pronunciation if the influence of L1 is removed (Hassan et al., 2007). Thereby, pronunciation errors of L2 learners are reflections of the sound inventory, sound combination rules and stress, and intonation patterns of their native language (Swan & Smith, 1987). This means that learners’ awareness of the differences between their mother tongue and target language contributes to teaching bilingual learners more systematically (Hung, 1993).

Rather than the similarities, regarding the segmental phonological differences among Persian and English, Bakhtiarvand (2008) has referred to the noticeable differences in consonantal distribution, which result in mispronunciation of the interdental fricative /θ/ sound with “a kind of in-between sound of the English / t/, /d/, /s/, and /z/” (p. 32), besides replacing voiced labiodental fricatives /v/ for labio-velar /w/ sound by Iranian learners. Perhaps one could improve pronunciation accuracy and intelligibility through the correct pronunciation of sounds and prevent mispronunciation of /s/ for /θ/ in “sin” instead of “thin” or /v/ for /w/ in “vill” instead of “will”. Furthermore, Nosratinia and Zaker (2014) observed the highest degree of substitution of /s/ or /t/ for /θ/ in an empirical study that supported previous findings. Their study reported that most frequent pronunciation errors were replacing the absent sounds of English in Persian (/w/, /θ/, /ð/, /ɔ/, /ɪ/) with those present in Persian, and replacing short vowels with long ones, as well as pronunciation problems in producing

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diphthongs and consonant clusters (p.107). Moreover, based on an empirical study by Ajabshir (2018), while indicating a more native-like L2 production for those existing sounds in L1, there is evidence to suggest mispronunciation for replacing /w/ with /v/, which does not exist in the Persian language. Additionally, Mirhassanin (2003) has reported even some Persian speakers of English studying overseas that adopt /s/ for /θ/, which brings about misunderstanding in communication with native speakers in another study. All these findings suggest that those English consonants such as /θ/ and /w/- which do not exist in Persian- are substituted with other English consonants or vowels, which can be attributed to mother tongue and contrastive analysis of L1 and L2.

As Piaget (1970) has argued, internal knowledge and input can be integrated through “assimilation” (p.706–707), which results in “a conservative force aiming at keeping the system close to its present form by incorporating the new input” (de Bot et al., 2005:57). Moreover, as mentioned earlier, L2 learners tend to perceive L2 sounds based on firmly established L1 phonological categories (de Bot et al., 2005:191). Consequently, the voiceless dental fricative consonant /θ/ changes into the alveolar sound /t/ in “thank” or to voiceless alveolar /s/ in “bath”, while; labio-velar /w/ sound changes into voiced labiodental fricative /v/ sound in “woman”. Therefore, Confusing /θ/, /t/- /s/ and /w/, /v/ usually leads to mispronunciation of the word which might result in decreasing the intelligibility.

Moreover, Piaget (1970) argued that while “accommodation” can change “any modification of an assimilatory scheme or structure by the element it assimilates” (p. 706–707), “a progressive force” input can change the input (de Bot et al., 2005:57). Here, the instruction can facilitate *input enhancement* (Bongaerts et al., 1997:463) by focusing on subtle L1/L2 phonetic contrasts (de Bot et al., 2005:191). Therefore, explaining the segmental phonological distance of the mother tongue and L2 besides introducing sound inventory

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through an authentic source of input explicitly might help provide a clear understanding of the nature of the L2 articulation system.

### 2.4. Factors Influencing L2 Pronunciation Development

As de Bot et al. (2005, p:66-67) stated, linguistic studies have demonstrated that learners have proved to be very good at L2 pronunciation even as late starters (Bongaerts et al., 1997; Bongaerts, 1999; Bongaerts et al., 2000) and attainment of a native-like accent is not impossible; however, various psychological and sociological factors influence language learning, such as “motivation, pronunciation instruction, learners’ social identity, error correction, native language, age, exposure, and attitude” (Pourhosein Gilakjani et al., 2020: 104) in the domain of L2 proficiency. Having intelligibility as the goal in pronunciation training in mind, as noted before, language teachers can help students set achievable targets concerning L2 pronunciation and phonological development. Thus, among all psychological and sociological factors influencing L2 pronunciation development, exposure to L2 and pronunciation instruction, motivation, and error correction -which are more relevant to the scope of this study- are discussed according to the Iranian context below.

#### 2.4.1. Exposure to L2 and Pronunciation Instruction

Individuals’ learning experiences might be affected based on the learning environment inside and outside the classroom. The inside-of-class language exposure is involved with syllabus design, teaching methodology and pedagogy, and appropriate educational materials. Meanwhile, all kinds of learning outside the classroom, including self-instruction, naturalistic learning, or self-directed naturalistic learning, are classified as outside-of-class language exposure (Benson, 2001). As a result, noting the effect of L2 exposure on L2 pronunciation (Kenworthy, 1990), active exposure to L2 outside the classroom would bring about more accuracy and intelligibility in L2 pronunciation.

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Moreover, when it comes to individual pronunciation training, considering the problematic role of pronunciation teaching and correction feedback (Parish, 1977), meeting the needs of individual local learners -who are strongly affected by regional accents or do not speak the formal language- is another influencing factor. Meanwhile, considering that teaching authentic pronunciation contributes to prompting the learners' efficiency in the target language (Namaziandost et al., 2018), many teachers are not confident in their L2 pronunciation knowledge and their ability to teach it (Foote et al., 2011). In a study by Nosratinia and Zaker (2014), the effect and positive relationship between the teacher's pronunciation knowledge - left without clear guidelines for pronunciation instruction (Pourhosein Gilakjani, 2016)- and that of learners are significant. Moreover, as mentioned earlier, Iranian EFL learners have few opportunities to communicate with native speakers or practice and hear the native-like or norm pronunciation in the everyday communication environment. Thus, alternative ways for exposure to communicative language and authentic pronunciation could be beneficial.

### 2.4.2. Motivation

Noticing that the undeniable effect of motivation on L2 learning has been proved in a way that higher language achievement is based on higher motivation (Masgoret & Gardner, 2003), L2 learners' interest and willingness could highly contribute to L2 pronunciation proficiency. In a review of current studies, Lima and Alves (2019) have argued that pronunciation, considered as a dynamic system, is affected by intrinsic variables such as motivation, besides exposure to the L2, willingness to learn, as well as explicit pronunciation teaching as the extrinsic variable (p. 44). They have highlighted the importance of motivation for using the target item while communicating through intelligible speech (p.41). Moreover, they argued that considering L2 pronunciation learning as a dynamic system, among other affecting factors, "any pedagogical intervention will be influenced by the various learner

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variables at play, such as students' motivation, exposure to L2, amount of feedback received, type of instruction" (p. 31).

As a psychological factor, keeping individuals determined to sustain L2 learning development is inspired by the combination of intrinsic and extrinsic factors, besides using language learning strategies. Dörnyei (1998) defines L2 learning motivation with the assumption of intrinsic motivation -engaged with individuals' interests in performing pleasant activities- and extrinsic motivation -engaged with individuals' interests in performing activities to attain effective performance (p. 46-78). Although the L2 proficiency process might be influenced by a combination of both intrinsic and extrinsic motivations or one of them, "instrumental motivation" and "integrative motivation" play a vital role in the L2 learning process as well (Gardner et al., 1972). This puts forward that individuals' functional goals -as the instrumental motivation or extrinsic motivation- besides, learners' interest in identifying the cultural aspects of L2 -integrative or intrinsic motivation- can contribute to students' L2 development process (Quan, 2014). Thereby, identifying a person's self-concept provides a better explanation of motivation within the definition of the integrative motivation factor. In this regard, Dörnyei and Ushioda (2009) conceptualized the theory of "possible selves" to reflect motivation for L2 learning on two paradigms of the L2 field and psychology. This represents an individual's hopes and wishes concerning the ideal L2 self and the one's expectations that one ought to achieve to avoid negative outcomes concerning ought-to L2 self. Thus, as an influencing L2 motivation self-system, integrativeness can be considered a specific factor of L2 learner's ideal self (Dörnyei, 2005) and pronunciation proficiency.

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### 2.4.3. Error Correction

Depending on individuals' learning targets, linguistic backgrounds, and classroom instruction, corrective feedback can provide information for recognizing students' pronunciation learning process. Derwing & Murray (2015) presented that "some L2 speakers genuinely need guidance to learn to produce comfortably intelligible speech" (p.31), while some need no pronunciation instruction depending on the learning context. In other words, some learners may need to pursue more individual feedback, as long as intelligibility is addressed. Here, it is crucial to consider the "Window of Maximal Opportunity" issue in the L2 learning environment (Derwing & Murray, 2015) when the learner starts the L2 learning process.

Former findings suggest that students are willing and expected to be corrected more than their teachers' desire for doing so (Roothoofs & Breeze, 2016; Kerr, 2017). According to the different stages of language processing and development, the lack of a direct and adequate feedback mechanism at the "attractor stage in DST" (de Bot et al., 2005: 16) would cause *fossilization* (Selinker, 1972) and proceed stabilization of an incorrect form before reaching the correct form. Considering the Iranian EFL learning context, the findings of empirical studies revealed absolute positive attitudes towards classroom oral error correction feedback (Peerdadeh & Entezamara, 2016). Moreover, in another study Pourhosein Gilakjani (2012) suggested a strong desire of students to speak proper pronunciation for preserving self-confidence in social interactions. As such, the findings indicate the significant tendency of learners towards correction feedback, but it can also be perceived that Iranian EFL learners are interested in receiving phonological knowledge and pronunciation correction feedback.

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### 2.5. Using MAPT-tools for Pronunciation Instruction

Noting that most L2 learners do not seem independent to identify and improve their pronunciation on their own (Derwing & Munro, 2013; Derwing & Rossiter, 2002; Dłaska & Krekeler, 2008), it seems necessary to provide them with authentic pronunciation material and increase students' autonomy simultaneously. A survey study by McCrocklin (2014) indicated that using technology to provide an opportunity for experimentation (Schwienhorst, 2008) is a safe environment (Banafa, 2008). Technology can enhance language learning by increasing students' autonomy (Benson, 2011) and fostering autonomy for pronunciation learning -which has been considered very teacher-dependent historically (McCrocklin, 2014). In this regard, Computer Assisted Language Learning (CALL) and Computer Assisted Pronunciation Training (CAPT) could be effective. Learners can access an "individualized, stress-free, self-paced learning environment with limitless access to a wide range of multimodal material as well as opportunities for immediate, customised feedback by CAPT resources" (Rogerson-Revell, 2021). Besides, MAPT-tools can add value to traditional learning methods through enhanced input (Yoshii & Flaitz, 2002), variety in providing feedback (Nagata, 1993), and types of assistance (Peters, 2007) to expand language learning options that teachers and students need to develop as L2 skills. In essence, MAPT resources have the potential to stand out in a crowd and offer technology for pronunciation teaching and learning anytime, anywhere.

Moreover, incorporating a variety of audio-visual input to the mobile apps (Rogerson-Revell, 2021) and MAPT-tools provides ample opportunities for exposure to a broader array of spoken languages, including different L1 and L2 accents. Respectively, in the study by Lee (2021), MAPT has been reported to be effective in the acquisition of English vowels. Based on the descriptive data analysis of 24 first-year college students, Lee (2021) reported positive progress in low intermediate students' perception regarding targeted challenging vowels for

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Korean English learners. The study showed that MAPT improves participants' production to some extent. Also, the potential effectiveness of using mobile phones for pre-intermediate Iranian EFL learners has been reported in an empirical study by Arashnia and Shahrokhi (2016). Their study indicated a positive correlation between receiving pronunciation instruction through mobile phones and proved that using mobile phones effectively improved participants' L2 pronunciation.

In addition, MAPT, as an alternative resource that provides authentic pronunciation training, can develop learners' pronunciation proficiency besides increasing their autonomy through maintaining the continual ongoing correction process without the constant interruption of an individual's performance for explicit pronunciation correction inside and outside the classroom. Rogerson-Revell (2021) stated that such resources could maximize opportunities for output from controlled pronunciation practice, such as L2 sound repetition or structured responses to authentic interaction in meaningful contexts. Such findings become even more relevant considering that MAPT can allow learners to practice speaking by receiving automated immediate individual feedback on their pronunciation through the integration of smart tools. Specifically, the incorporation of technologies such as automated speech recognition (ASP) and artificial intelligence (AI) could provide ample opportunities for oral production and individual feedback.

However, the integration of technology and computer-assisted training is considered adequate for teaching pronunciation provided that it is well-organized and thought-through (Levis, 2007). Many available MAPT-tools are commercially technological-driven rather than pedagogy-driven, without any clear fit corresponding to L2 classroom pedagogy, mainly concentrating "on drilling and repetition, as advocated in audiolingual approaches" (Pennington & Rogerson-Revell, 2019:235). In the study indicating the complexity of achieving Information

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Communication Technology-Integrated Language Learning, Jager (2009) noted the important role of the teacher in designing the learning activities which are integrated into those contextualized L2 learning tasks that are meaningful and relevant, as well as guiding the students in learning how to use these materials (p.344). Here, the undisputed role of CALL in enhancing learning outcomes in the teaching/learning process (e.g., Colpaert, 2006; Diaz & Bontebal, 2000) can support performing tasks within the framework of “learning by doing” (Long, 2015; Samuda & Bygate, 2008). Tasks become even more relevant when the pedagogical value of the learning content is observed and effectively followed through the framework of learning by doing in MAPT-tools. Subsequently, integrating methodological principles of TBLT with technology-supported pedagogy (Doughty & Long, 2003) can facilitate knowledge formation in MAPT-tools. Noting that flexibility in the task process enables students to have authority over their language learning steps (Egbert, et al., 2007), MAPT-tools could provide more opportunities for self-authorized learning as well as pronunciation production feedback while performing language-activating/fluency-stretching tasks and using tasks for form-meaning connection and knowledge construction in the sequence of the lesson plans (Samuda, 2001).

According to Willis (1996), when the task follows the start of the three-step task phase, it can be appropriately incorporated into the task cycle. In other words, with the grasp of the existing framework of TBLT - implementation of task-based learning and teaching, including a pre-task, during-task, and post-task phase- mobile phone applications and MAPT-tools could contribute to the pedagogical sequence. Therefore, as “technology could offer opportunities for contextualizing tasks while simultaneously improving pronunciation” (Rahnavard & Heidar, 2017:52), teaching pronunciation would be developed through the integration of task-based learning and teaching through MAPT-tools. Here, the main target might be practicing segmental characteristics of isolated words. However, having argued over the superiority of

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intelligibility rather than striving for accuracy and native-like norms, including both segmental and suprasegmental perspectives of pronunciation training through practicing communicative components in task cycles for working on suprasegmental features of speech at sentence level besides running through the segmental pronunciation of isolated words could encourage intelligibility as well as accuracy at the same time. This notion has been indicated in a study by Gordon (2021), which specifies the potential benefits of implementing communicative components in task-based instruction. Subsequently, the communicative component in pronunciation instruction can allow the learner to automatise the forms learned under controlled conditions (Celce-Murcia et al., 2010) while embedded into the task cycle.

Nevertheless, one might refer to a common criticism concerning the “one size fits all” notion through providing generalized content and feedback according to CAPT tools (Rogerson-Revell, 2021:192) rather than individual learner’s support (Derwing & Munro, 2015; Levis, 2018). Mentioning the usefulness and meaningfulness of MAPT-tools depending on the underlying pronunciation pedagogy, introduced drills for supporting accuracy could target more holistic production and assessment of natural and intelligible pronunciation by focusing on both segmental and suprasegmental features by practicing the communicative language. Meanwhile, there might be actual challenges concerning the availability of specific MAPT-tools globally. Considering the availability of free or premium versions of different mobile apps globally, some learners might not have proper access to the full features of such learning content due to financial or technological problems. Respectively, teachers’ awareness of the introduction and integration of appropriate tools might be affected.

Despite all counted problems, it seems to implement MAPT outweigh the disadvantages due to reported studies, positive reinforcement of learning content and offering immediate and reliable feedback which could be carried out in a sequence of TBLT at the same time the learner

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strives to learn the linguistic forms through focusing on form and meaning for understanding and producing the message.

### 2.6. Statement of Purpose

To pursue the operationalization of the current research, the study assumes that EFL learners in Iran could benefit from using MAPT-tools as an out-of-classroom activity for pronunciation accuracy and intelligibility enhancement. Moreover, the study investigates if completing pronunciation tasks and providing an extra opportunity for pronunciation learning through a task-based MAPT-tool as an out-of-classroom activity could help EFL learners achieve pronunciation accuracy and improve speech intelligibility in terms of reported consonants. This could be addressed by providing a source of input and increasing learners' autonomy in the learning process using a task-based MAPT-tool. Subsequently, the study could fill the reported gap concerning pronunciation accuracy and intelligibility by expanding the possibility of receiving immediate, reliable feedback, which helps students set achievable goals in pronunciation development, meeting individual differences in task repetition, and providing meaningful input.

Moreover, the study aimed to provide insight into whether there is a correlation between motivation factors for pronunciation learning and using MAPT-tools among Iranian EFL learners. The purpose is to study the motivation for using MAPT-tools in line with the previous study by Sadeghi and Richards (2015). Their study reported textbooks as the primary teaching resources, and computer-based materials were less often used in Iran. The observations in their study revealed that "many teachers often revert to an audio-lingual drill-based mode of teaching in their spoken English classes" (Sadeghi & Richards, 2015:217). Considering the critical role of pronunciation in oral communication development (Sicola & Darcy, 2015), and the significant number of available MAPT-tools, mobile apps could

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provide the chance of true access to authentic materials in daily situations by norm and native speakers for practicing authentic pronunciation, at the appropriate level, at any time.

Noting that the integration of using a MAPT-tool that includes task-based activities in the Iranian EFL learning context was not considered before, the notion was extrapolated in this study through research questions to gain a deeper grasp of the potential benefits of using a task-based MAPT-tool. Thus, considering the reported pronunciation issues in the Iranian EFL context, this study investigated if the use of a TBLT- based mobile application bears an impact on the pronunciation proficiency of two problematic consonants (/θ/, /w/) in terms of accuracy and intelligibility enhancement for the Iranian EFL learners. In addition, the study took the correlation between the Iranian students' motivation for pronunciation learning and using MAPT-tools. To conclude, the following questions will be attended to according to the Iranian EFL learning context:

1. Does using a task-based MAPT-tool improve pronunciation accuracy in terms of problematic consonants (/ w/, /θ/)?
2. Does using a task-based MAPT-tool improve speech intelligibility?
3. Is there any correlation between learners' motivation factors for pronunciation learning and using MAPT-tools?
  - 3.1. Is there an effect of using the task-based MAPT-tool on motivation factors for pronunciation learning and using MAPT-tools?

### 3. Method

To measure the improvement in pronunciation accuracy and intelligibility through using a MAPT-tool, the researcher used a quasi-experimental design in an online empirical study. The subjects (n=20) were randomly assigned to control and experimental groups to test the effect at a time. The researcher applied the experiment to the experimental group to

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identify the effect of the independent variable -considered as the chosen MAPT-tool-on the dependent variable –regarding pronunciation accuracy and intelligibility progress based on the online pre-and post-tests in both groups to answer the first and the second research question as well as administration of an online motivation survey addressing the third research question. Audio recordings and motivation surveys were received in individual online sessions as the pre-and post-tests in both groups. All participants in the experimental group completed the out-of-classroom learning activity, including practicing pronunciation tasks through a MAPT-tool explicitly besides participating in the ordinary classroom activities for two weeks. The control group only participated in ordinary and routine classes based on the course content and syllabus. According to the syllabus, the instructor mainly focused on read-aloud tasks and grammar instructions, and immediate pronunciation error correction was mainly done based on her judgments. Both groups were entitled to participate in a motivation survey evaluating motivation factors and their motivation for using MAPT tools, as well as recording a reading aloud activity from another standard sample text at the final individual interview session with the researcher as the post-test. Three human raters assessed recorded audio files of both experimental and control groups as the pre-and post-tests before and after the treatment. The selected Likert scales for the tests and the motivation survey were analysed. The first spontaneous speech at the pre-test was used as the reference to get a holistic view of participants' speech intelligibility. The rating criteria, accuracy, and intelligibility features are discussed later.

### **3.1. Participants**

Twenty participants were recruited from a general English course in an Accounting Associate Degree program at Shariati Technical and Vocational University (Iran). They were all female university students ranging from 18 to 36 years (mean age = 20.5). They were

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supposed to have somewhat similar educational experiences in learning English, passing the requirements for university entrance exam as intermediate EFL learners, and now spending a B2 level course according to the Common European Framework of Reference for Language (CEFR) in the second year of their degree. However, in the survey administered at the end of the study, some of the participants reported being at A2 level. Based on the survey questionnaire at the post-test, 50 percent of the participants did not have previous experience of using MAPT-tools before this study. Additionally, the survey indicated that five participants had some linguistic background concerning knowledge of Arabic, Azeri, and Kurdish languages besides speaking Persian and English languages. Also, two participants had the experience of learning French. Considering that participants were randomly assigned into experimental and control groups, one of the students speaking Azeri and two students speaking Kurdish were assigned to the experimental group by chance, and the other students with extra-linguistic backgrounds were in the control group. All participants indicated that they took part in the study to improve their pronunciation. They had regular general online English classes for B2 students in 3 hours a week, including a break for a quarter in between. The educational content mainly focused on reading aloud, reading comprehension, and grammar learning tasks through studying introduced books in the syllabus, including *Select Readings and Grammar Points* by Faryad and Yaghoot (2008), *An Essential Guide to English Grammar* by Faryar (2017), and *An Essential Guide to English Grammar (Test)* by Faryar and Tavakoli (2017). The specific pronunciation training was introduced in line with the CSM approach during the class, mainly focusing on immediate feedback pronunciation correction by the instructor. At the same time, students performed reading comprehension and grammar tasks.

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### 3.2. Materials and Procedure

Generally, materials for the present study consisted of a task-based MAPT-tool as the treatment to compare the results at the pre-and post-tests and a motivation survey to evaluate the correlation between participants' motivation for pronunciation learning and using a MAPT-tool.

Despite the availability of a significant number of MAPT apps for mobile phones, first, *articulate.xyz* (2021, Version 1.1.23) was selected as an application with potential specifications for pronunciation training. Then, the researcher discussed the idea and suggested a series of communicative learning activities based on the TBLT task-cycle with the founder and technical team of the company to be implemented in the app. After several sessions with the company, the communicative tasks were published in a series of task-based activities based on approval. The task-based cycle included pre-main-and post-task activities through communicative scenarios and gamification in collaboration with the company. Thus, the task-based MAPT-tool was prepared to be implemented in this study.

After negotiations with the public University of Shariati, twenty participants were randomly recruited from an online English course. The purpose of performing the study at the selected university was to investigate the topic concerning public higher education and the official educational system rather than institutions in private sectors. The participants were informed about the general topic of pronunciation proficiency development but not the precise procedure or the MAPT-tool at the very beginning. However, the researcher shared information about the study's purpose, nature, duration, and drawbacks. Also, she made it clear that the participants could withdraw their cooperation at any time, without any consequences. They were randomly assigned into experimental and control groups. Then, both groups' participants were asked to participate in individual online sessions with their

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instructor for the pre-test. The instructor willingly helped the researcher because of being interested in the research topic and provided an opportunity for improving students' pronunciation proficiency. During the pre-test, both groups' participants were asked to record themselves while discussing their objectives and motivation for learning English as a spontaneous speech and performing a reading aloud activity from a standard short passage in a separate file individually. Individual live sessions took approximately five minutes. The purpose of recorded self-introduction was to maintain the authenticity of a spontaneous conversation without a uniform application. The recordings could provide the raters with a holistic view of the participants in both groups. The short English passage (available at speech accent archive: [browse \(gmu.edu\)](http://browse.gmu.edu)) included sixty-nine words. The text had ten terms with targeted consonants (five words including /θ/, and five words including /w/) to be read in the reading aloud activity for less than one minute and checked for accuracy in this study. Overall, the passage used at the pre-test included five sentences. Three human raters assessed these sentences regarding accuracy and speech intelligibility. The assessment procedure is fully discussed later in this paper. The instructor asked the subjects to read through the entire passage silently once for familiarization to perform the reading actively. Then, while reading in the live session with the instructor, the participants were asked to simultaneously record themselves in WhatsApp and send their recorded files and contact numbers and email addresses in private WhatsApp (Version:2.21.24.22) messages to the researcher's contact number. The researcher received the audio files and contact information to proceed with further steps. The passage used for the pre-test is available in appendix A.

Once the instructor and participants conducted the pre-tests, ten participants in the control group continued with ordinary classroom instruction for two weeks, and ten participants in the experimental group joined the WhatsApp group. After creating a shared WhatsApp group, participants' accounts were activated in the app based on their email

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addresses. The experimental group installed the premium version of the app for free. They accessed the premium version upon their email addresses in collaboration with *articulate* .xyz company. Due to internet restrictions in Iran, only those students who used a virtual private network (VPN) could download the app and start the experiment. A short introduction explaining the topic of the study and guidelines on how to use the app was shared in the form of some screenshots referring to available pronunciation instructions at the app to ensure that all participants in the experimental group followed the same routine. Then, at the beginning of week one and week two, students were asked to follow the task cycles through the communicative scenario designed for each targeting difficult consonants for one week. At the end of each week, the researcher asked participants to share screenshots of their achievements in the post-task activity.

The task cycle included the pre-main and post-tasks to practice one difficult consonant for approximately ten minutes each week. During the first week, the researcher asked the students to practice the consonant /θ/ through the designed tasks and share their achievements of the final post-task in the WhatsApp group. Similarly, during the second week, learners were asked to practice the second consonant: /w/ and share their final achievements of the post-task in the group. The experimental group used the MAPT-tool for two weeks to improve their pronunciation proficiency as an out-of-class activity, anytime, anywhere. However, the control group spent their regular classes with the same routine of pronunciation correction feedback by the instructor whenever necessary during online classes while performing reading aloud tasks or doing grammatical exercises. This was in line with addressing the first and second research questions regarding the evaluation of pronunciation accuracy and intelligibility after using the app.

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In the third week, the researcher sent individual invitations asking all subjects to participate in individual online meetings with the researcher as the post-test. The post-test involved asking participants of both groups to perform a reading-aloud activity and taking part in the motivation survey in the private online sessions with the researcher. The researcher asked participants to read aloud the text and record themselves as a WhatsApp message and send it to the researcher's contact number at once during the live session. The second short standardized English passage (available at: [speakmethod.com](http://speakmethod.com)) included sixty-nine words. Like the pre-test, the researcher asked the subjects to silently read through the selected short passage once for familiarization at first. The passage at the post-test was approximately one minute in length, including eleven words with targeted consonants (seven words including /θ/, and four words including /w/). Overall, the short passage used at the post-test included ten sentences.

Considering that keyword recognition is commonly used for measuring intelligibility (Loukina et al. 2015), while segmental pronunciation accuracy was determined at the word level based on authentic pronunciation norms, intelligibility was measured based on full sentence utterances by the raters. After an offline session discussing two sample audios, the raters judged the audio files individually for the accuracy of pronouncing vocabularies -based on native-like norms- and the intelligibility of utterances -based on speech comprehensibility- in both control and experimental groups in response to the first and second research questions. The passage used for the post-test is available in appendix B.

A motivation survey was administered to participants of both groups in response to the third research question in this study. The researcher linked their performances to the survey as a part of the post-test to find a correlation between their interests for pronunciation proficiency learning and using MAPT-tools. To this end, considering the effect of motivation

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on L2 learning, an online short form of the adjusted translated version of the motivation survey -done by Taguchi et al. (2009) for English language learning- was distributed among both groups in the post-test individual interview sessions (available at Proficiency (porsline.ir)). Translating the online survey to Persian was to provide the participants with a more accurate understanding of the topic. The list included 17 questions such as: “I can imagine myself speaking English as if I were a native speaker of English.” and “English language learning applications on mobile phones have a positive effect on pronunciation learning for further education.” (on a Likert scale from strongly disagree to strongly agree) which approximately took two minutes to answer. As such, the researcher could evaluate students’ motivation for pronunciation enhancement regarding attitudes to L2, ideal L2 selves, ought to L2 selves, instrumentality factors, as well as attitudes to MAPT tools within the framework of the theory of “possible selves” by Dörnyei and Ushioda (2009). This was in line with promoting the grasp of integrative motivation factors for pronunciation improvement in the Iranian context and investigating their attitudes towards using MAPT tools. Considering the time limit for online post-test interviews and the motivation survey, the researcher included seventeen questions in the motivation questionnaire. Overall, eight questions targeted factors concerning L2 motivation, and nine items targeted attitudes to using MAPT-tools in the motivation questionnaire. Furthermore, some demographic information of the participants, such as age, gender, and self-evaluation of English language proficiency level, were asked in the survey. The primary purpose was to provide a deeper grasp of the participants’ self-evaluation for creating individual profiles with more details. The complete list of questions and the online adjusted Persian one screenshots can be found in Appendices C and D.

Below is the complete description of the selected MAPT-tool and detailed information on the training procedure. Keeping in mind the level of participants in this study (B2),

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intelligibility was generally expected. However, the researcher considered the possible effect of fossilization and assimilation to investigate accuracy and intelligibility “with a high degree of control” (Council of Europe, 2018, p:136). Here, the primary purpose was using the TBLT MAPT-tool to help the students improve pronunciation of reported consonants concerning segmental perspectives or accuracy at word level and suprasegmental perspective or intelligibility at the sentence level. The training procedure will be further elaborated on below.

### 3.3. TBLT MAPT-tool and Procedure

#### 3.3.1. Implementing TBLT Cycle

The researcher chose *articulate. xyz* as the MAPT-tool to investigate the effect of a task-based app. This app was chosen due to explicit visual images and videos describing the target sounds, example words for practicing target sounds, an ASR feature for instant feedback for self-diagnosis /self-evaluation, and instant, reliable feedback for segmental errors as practicing suprasegmental aspects of phonology. Indeed, some of the features of the app included: model pronunciation videos displaying lips pronouncing, reading aloud tasks, minimal pairs, and individual feedback to develop learners' pronunciation proficiency based on the British norm. A free version grants access to first lessons and activities but accessing all features costs 8.49 Euros at the time for monthly membership payment. The participants in this study were granted unlimited access as premium members for free. The operational description of the app is available in Appendix E.

To implement the task cycle based on TBLT, the researcher contacted the developer company to suggest and discuss a comprehensive task cycle for promoting accuracy and intelligibility in communicative scenarios. After several meetings with the founder and

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technical members of *articulate.xyz* company, the researcher accomplished offering suggested task-based scenarios based on pre-task, main-task, and post-task activities. Subsequently, a gamification task was considered at the post-task to create positive reinforcement.

Among newly released scenarios, two topics explicitly were designed to teach targeted consonants addresses in this study in pronunciation tasks. Each scenario presented one consonant in a communicative context, following a task cycle for pronunciation training. The activities were based on “tasks” as the primary unit for focusing on “meaning” through using information “gap” to provide the learners with autonomy to rely on linguistic and non-linguistic knowledge (Ellis, 2009) by using ASR besides gamification to receive individual’ feedback in pre-task, main task, and post-task phases. Fulfilling all tasks took less than 10 minutes approximately, and phases were carefully structured and organized around familiar interactive topics to increase users’ autonomy and agency (Skehan, 2003; Blake, 2017) in pronunciation enhancement through the following procedure.

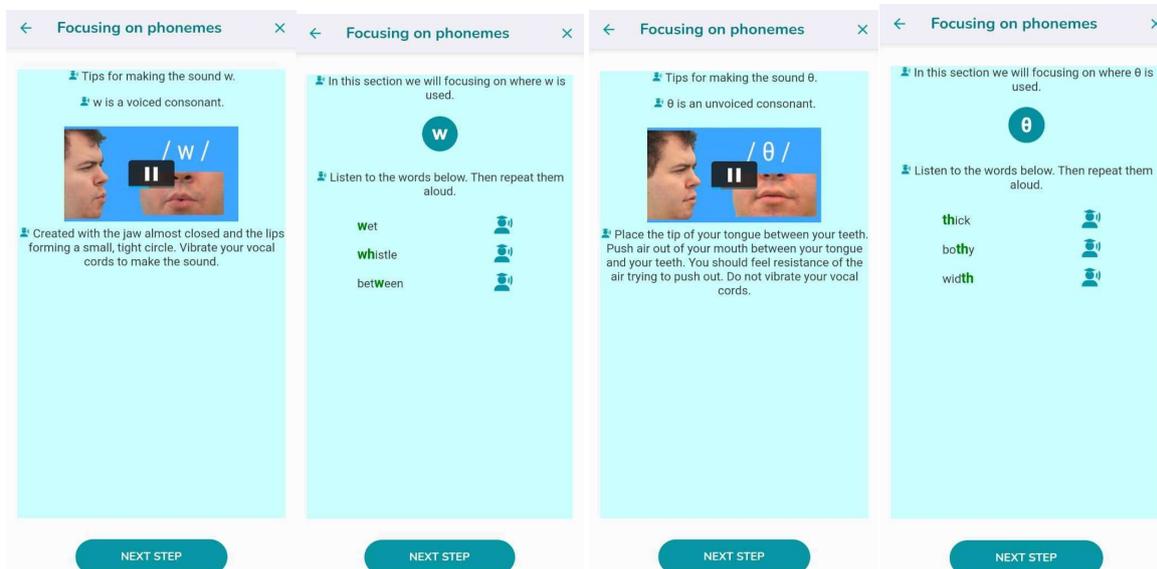
### 3.3.2. Procedure

In the beginning, the researcher shared screenshots to introduce *articulate.xyz* in the WhatsApp group. Training in week one for the experimental group started with sharing the screenshots referring to pronunciation clips of one of the problematic phonemes (/θ/) from the app’s library. The purpose was to help learners follow the same instruction. The videos presented explicit training of relevant vocabularies, including targeted consonants for task reinforcement, promoting accuracy and segmental perspective before working on intelligibility and suprasegmental perspective through communicative conversations presented during the task cycle. Then, both segmental and suprasegmental characteristics of speech were involved in this study. The same routine was repeated for the second phoneme (/w/) in week two (Figure 1).

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**Figure 1.**

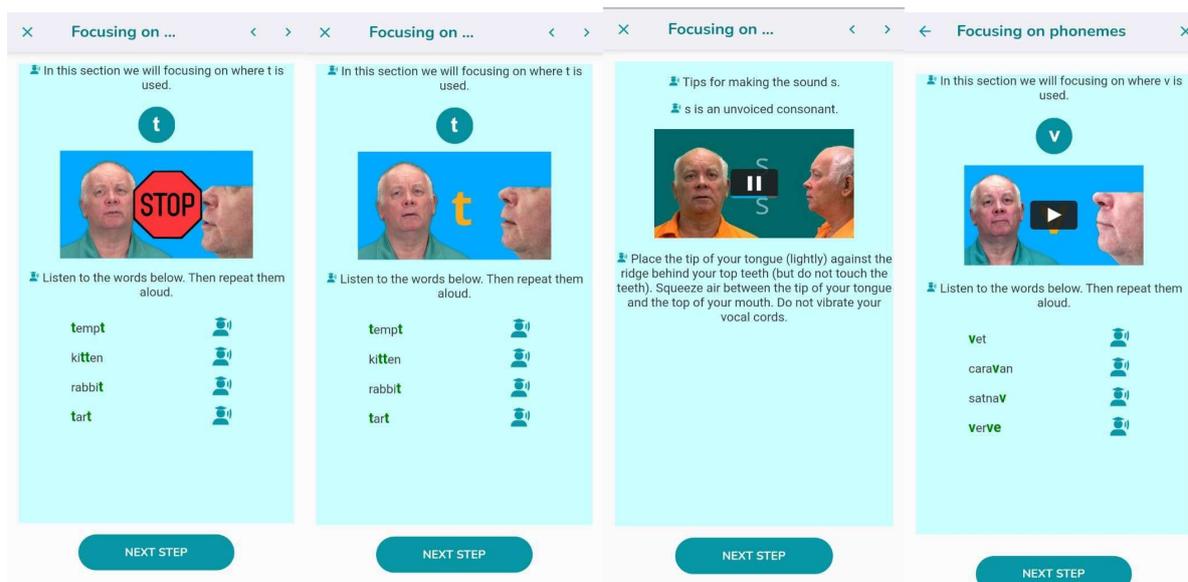
*Screenshots from the articulate.xyz app: Videos focusing on pronunciation of phonemes during weeks one and two*



To prevent assimilation, mispronounced phonemes were presented to increase noticing substitution of (/t/) and (/s/) as stopped voiceless consonant for (/θ/), and (/v/) as a voiced consonant for (/w/) (Figure2).

**Figure 2.**

*Screenshots from articulate.xyz app: Videos focusing on mispronounced phonemes*

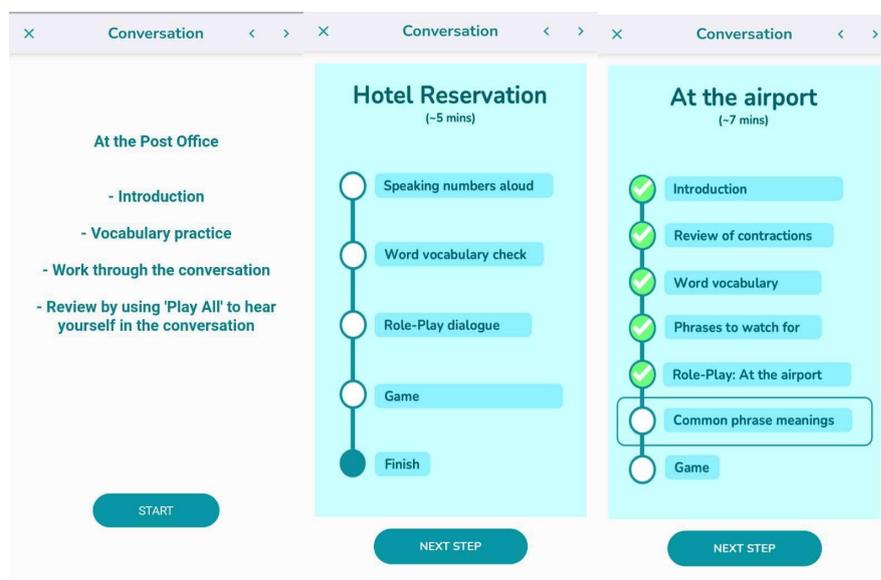


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The task seemed relevant for increasing awareness and positive reinforcement of those sounds that most Iranian EFL learners have production problems with the authentic articulation. Then, task cycles were briefly mentioned in screenshots indicating the individual relevant map, which introduced the entire cycle for pronunciation practice of the first consonant in week one (/θ/). The screenshots included: topic introduction, reviewed contractions, pronunciation practice for out-of-context vocabularies and phrases, role-play activity, and post-task game. While describing the task process and app features in the WhatsApp group, the researcher asked the users to practice task sequences focusing on reading aloud vocabularies, transcript sentences in stereotyped communicative conversations, and sharing screenshots of final gamification tasks as the pre-task, main-task, and post-task activities individually out of the classroom. The same training was repeated for the second consonant in week two (/w/) (Figure 3).

**Figure 3.**

*Screenshots from the articulate.xyz app: indicating task cycle*



### 3.3.2.1. Pre-task Activity

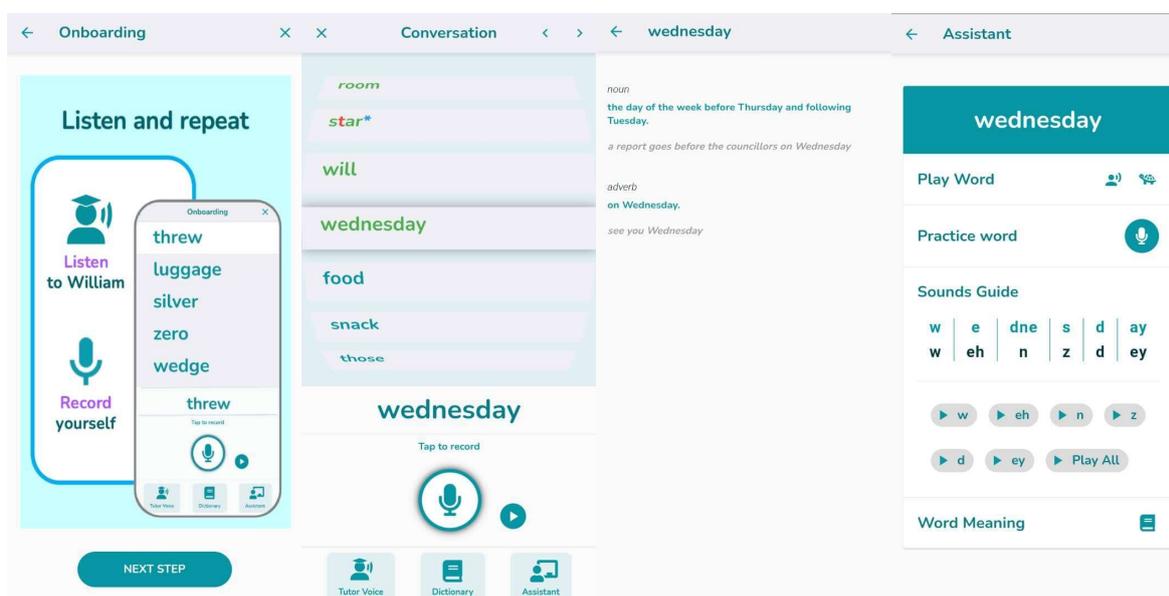
Each lesson started with an easy short audio recording presenting the topic as a warm-up and awareness training to combine pronunciation practice with communicative language

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skills. Moreover, it took the user to a focus-on-form activity to promote pronunciation practice with a list of vocabularies targeting clear pronunciation of phonemes, required to provide learners with meaningful material (Nation & Newton, 2009). Indeed, a list of target phonemes in topic-related vocabularies was presented to provide users with explicit pronunciation teaching. The explicit pronunciation teaching task was enriched with “Tutor voice”, “Play all”, “Dictionary”, and “Assistant” features to provide the user with adequate input with repetitions and modifications for particular phonemes during the entire task. “William”, the English tutor with a British norm accent, was present to assist and read-aloud vocabularies based on the app user’s interest. Users were required to articulate the entire list (typically 8-11 words) carefully to receive immediately provided feedback, which is considered as the significant appeal of implemented ASR in CAPT (Hansen, 2006; Neri et al., 2002). The feedback is presented in green, yellow, red, and blue, meaning great, ok, missing, and extra sound. The pre-task activity presented the target vocabularies in a communicative conversation on a specific topic to the learners in the main-task activity (Figure 4).

**Figure 4.**

*Screenshots from the articulate.xyz app: explicit pronunciation pre-task activity*



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### 3.3.2.2. Main-task Activity

The main task offered a simple adaptation of communicative language lessons, presented in a role-play, to practice one targeted phoneme communicatively during weeks one and two. The main task is to practice introduced consonants in the pre-task in communicative contexts through focus-on-form to deal with intelligibility and including suprasegmental characteristics of speech in a natural conversation. The scenarios were enriched with a brief topic description. The meaning of the introduced relevant phrases and vocabularies were presented. In each scenario, the tutor was available to present a model of listening and repeating for focusing on holistic characteristics of natural conversation and intelligibility. Therefore, the users could practice speech intelligibility and suprasegmental perspective of conversations in communicative scenarios during the main task (Figure 5).

**Figure 5**

*Screenshots from the articulate.xyz app: main-task activity*



### 3.3.2.3. Post-task Activity

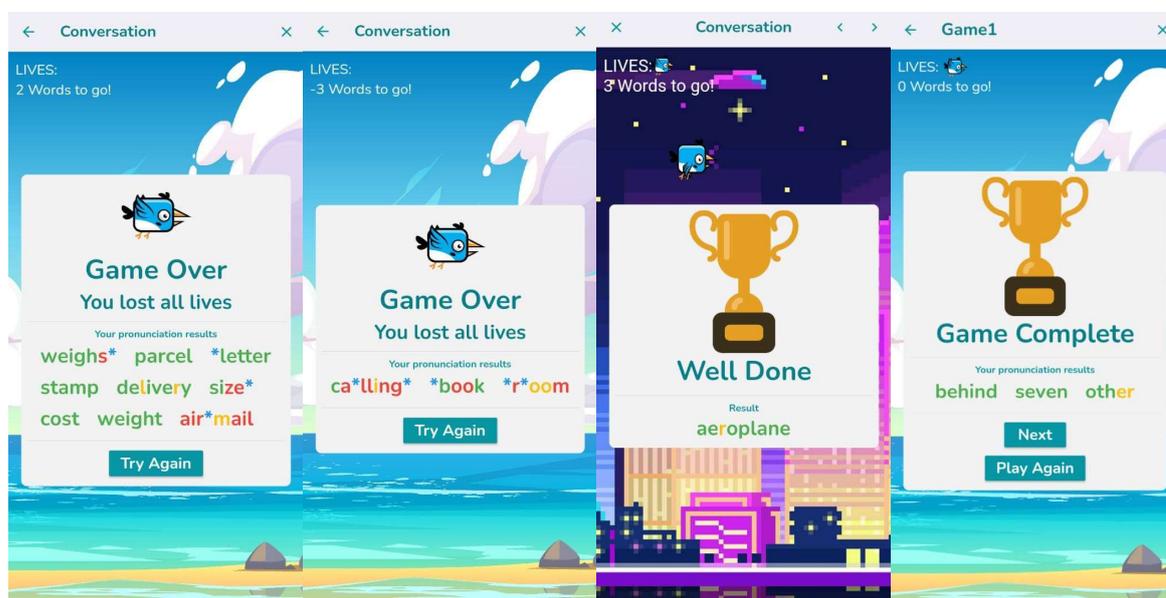
Once the learners were done with the scenario, they could proceed with reviewing “Common phrase meanings” and “Game” tasks for task repetition and positive reinforcement.

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The embedded gamification task provided the learners with immediate and authentic pronunciation feedback as the post-task activity. In this phase, the app users were supposed to feed the bird with spontaneous single target utterances based on the pre-task vocabulary list to win a virtual trophy and receive feedback on their level of accuracy. Subsequently, each attempt is followed by immediate, colourful feedback on each phoneme, similar to the previously noted pattern, to reflect pronunciation proficiency. Students could practice contrasted sounds such as (/w/, /v/) and (/t/-/s/, /θ/) to practice phonological contrasts as well. Winning the competition is based on the correct or relatively correct pronunciation of the entire vocabulary list introduced in the pre-task phase. This activity conceivably leads to extensive reinforcement of pronunciation accuracy of target phonemes for word recognition and individual practice (Ehsani et al., 1998) for building confidence (Figure 6).

**Figure 6**

*Screenshots from the articulate.xyz app: post-task activity*



### 3.4. Raters

Three human raters measured pronunciation accuracy and intelligibility at the pre-and post-tests as the subjective measures to assess the quality of the pronunciation proficiency.

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According to Lord (2008), a phone-level comparison can be made to assess the pronunciation mistakes by comparing non-native speech to the native speech. Subsequently, the raters, including a native speaker, a professional English speaker, and the researcher herself, conducted independent scorings to check recorded utterances regarding the accuracy and intelligibility of the targeted consonants. The band descriptors determined the level of accuracy of pronounced targeted consonants from 0 -meaning: there is a noticeable difference in quality- to 1 -meaning: there is no noticeable difference in quality-. Moreover, speech intelligibility was rated based on an adjusted Likert rating scale by Valente et al. (1997) from 1 (Speech is consistently unintelligible to familiar and unfamiliar listeners.) to 5 (Speech is consistently intelligible to familiar and unfamiliar listeners.). The questionnaires used for speech sound accuracy and intelligibility in pre-and post-tests can be found in Appendices F and G. To start ratings, the raters checked the verification of interrater agreement for two samples pre-and-post-tests in a face-to-face meeting at the initial stage. Separate files for individual participants' including recorded audio files for pre-and post-tests and separated rating questionnaires for pre-and-post-tests were shared in a google drive among the raters to collect individual ratings for both audio tests of pre-and-post tests in terms of accuracy and intelligibility. Further, prior to the investigation of research questions, the interrater reliability of results was analysed to ensure a high agreement in all data sets. The two-way average random-effects model was used to determine the intraclass correlation coefficient (ICC) to measure ratings' reliability.

### 4. Results

Twenty participants took part in the present study to investigate if using task-based MAPT-tool increases pronunciation accuracy and speech intelligibility regarding the previously reported consonants (/w/, /θ/) among Iranian EFL learners. Moreover, the correlation between motivational factors for pronunciation learning and using a MAPT-tool,

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besides the differences between motivational factors of the participants in the control and experimental groups, were studied. All the data obtained from the speech rating and motivation questionnaires was imported to Excel to execute the statistical analyses using Excel and RStudio (RStudio Team, 2021) to find answers to three research questions. For all statistical analyses an alpha level of  $\alpha = .05$  was adhered.

Once the raters assessed the shared audio files in the google drive, the intraclass correlation coefficient (ICC) was run prior to the investigation of research questions to check the interrater reliability. As displayed in Table 1, in all data sets concerning accuracy (Acc.) and intelligibility (Int.), the three raters indicated a high agreement. Based on the results, good reliability was found with ICC ranging from 0.71 to 0.92 for the pre-and post-tests, and  $p$  values were significant concerning both tests.

**Table 1**

*Intraclass correlation coefficients: Two-way average random-effects model*

	type	ICC	F	df1	df2	p	lower bound	upper bound
Acc.-pre	ICC2k	0.71	4.7	19	38	2.4e-05	0.43	0.86
Acc.-post	ICC2k	0.92	16	19	38	1.6e-12	0.85	0.96
Int-pre	ICC2k	0.92	17	19	38	3.7e-13	0.82	0.96
Int-post	ICC2k	0.89	14.4	19	38	6.3e-12	0.73	0.95

### 4.1. Research Question 1

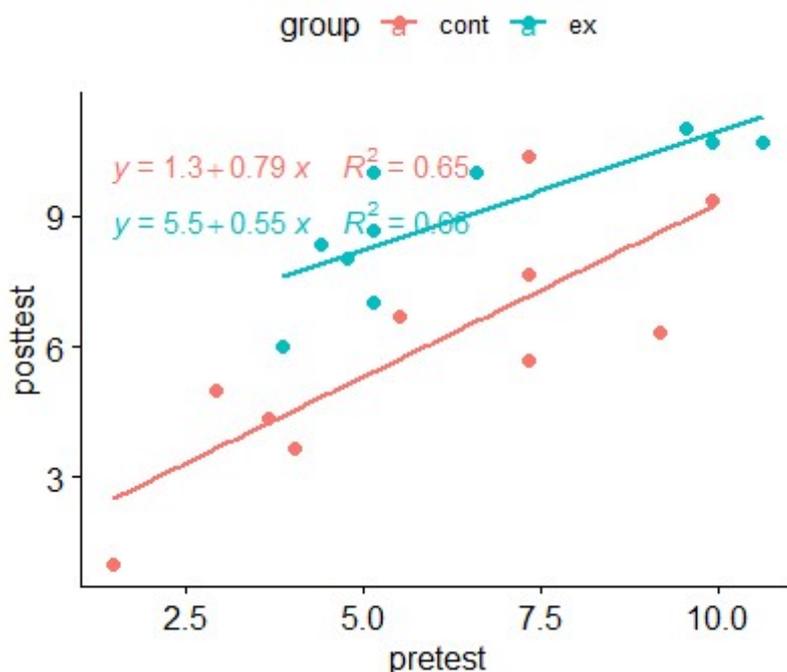
To see if there was a difference in the level of pronunciation accuracy through using a task-based MAPT-tool in response to the first research question of this study, ANCOVA was used to compare the mean scores obtained from the pre-and post-tests in both experimental and control groups in pronunciation accuracy of targeted consonants. Taking into account the values for skewness and kurtosis and the Shapiro-Wilk tests (all non-significant), the descriptive analysis indicated that the experimental group had a higher post-test mean ( $M=9.03$ ,  $SD = 1.70$ ) than the control group ( $M = 6$ ,  $SD = 2.74$ ). This suggests that the experimental group has improved pronunciation accuracy of the target sounds compared to

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the control group. The correlation between the pre-and post-test is visualized by the scatter plot (Figure 7).

### Figure 7

*Linearity of the relationship between pre-test and post-test in experimental and control groups*

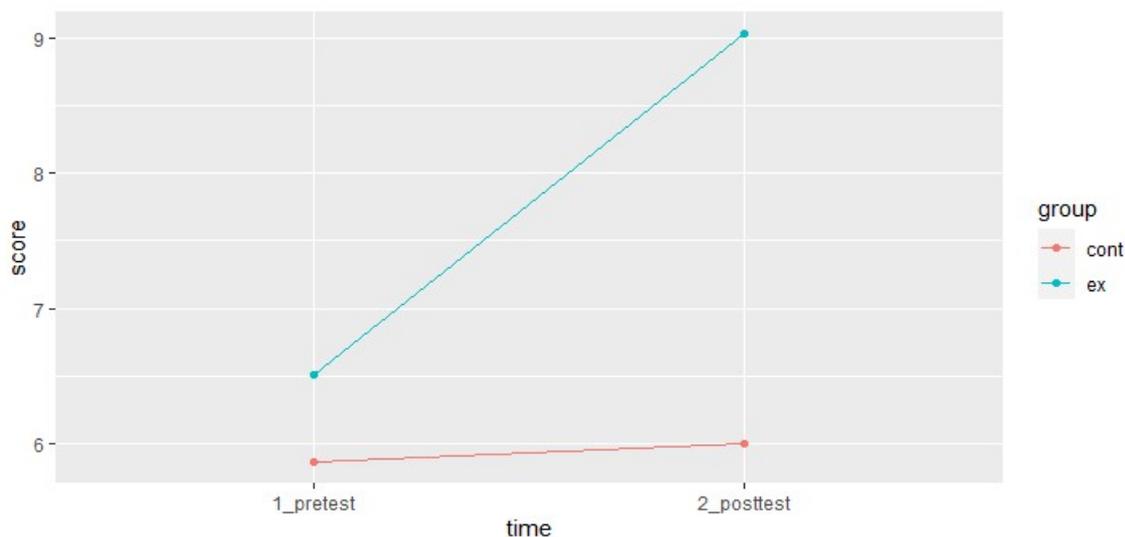


Overall, the ANCOVA result indicated a statistically significant difference in post-test pronunciation scores between the experimental and the control groups once the researcher checked the normality of data distribution and the homogeneity of variances across both groups. The researcher constructed a linear model of pronunciation accuracy as a function of using the application. This model was significant ( $F(1,17) = 16.45, p < .001, \eta^2 = .49$ ), and it can be seen that there is a positive coefficient for using the app in the experimental group, suggesting that as the app is used, pronunciation accuracy scores for the target consonants also increase (Figure 8).

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**Figure 8**

*Line plot indicating pronunciation accuracy scores of both groups in the pre and post-tests*



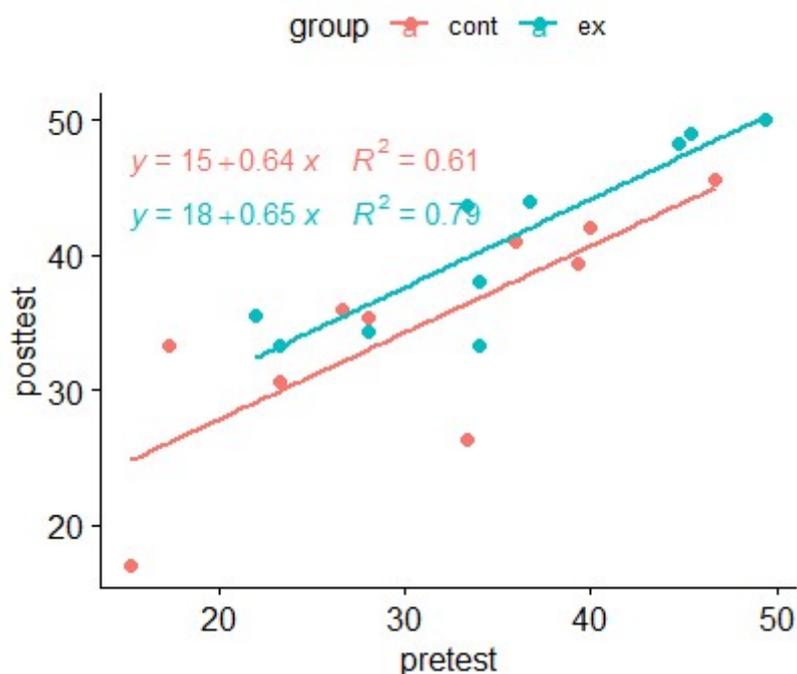
### 4.2. Research Question 2

Similar to the first research question, the second question concerning speech intelligibility enhancement was also answered by comparing the experimental group with the control group on their intelligibility scores using ANCOVA. First, descriptive analysis was run to investigate the means of the two groups during the pre-test and post-test phases. Based on the Shapiro-Wilk and Levene's tests, homogeneity of variance was assumed, and a higher mean score for the experimental group ( $M= 40.95$ ,  $SD =6.80$ ) compared with the control group ( $M= 34.66$ ,  $SD =8.42$ ) at the post-test were indicated. However, this might be because they performed better than the control group even at the outset of the study. The use of ANCOVA made it possible to cancel out this initial difference. The visual inspection of the scatter plot in Figure 9 showed that there was a linear relationship between pre-test and post-test intelligibility scores for each group.

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**Figure 9**

*Linearity of the relationship between pre-test and post-test in experimental and control groups*

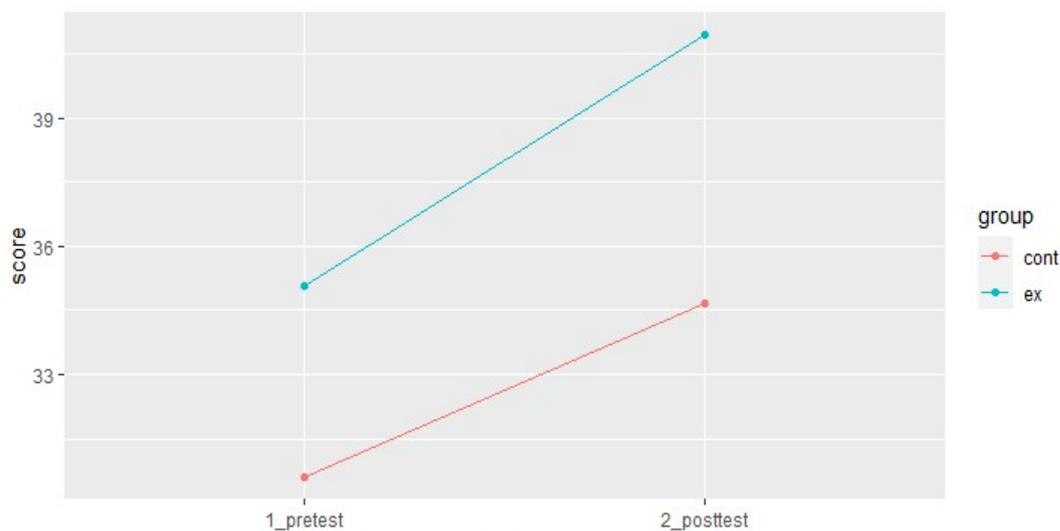


Overall, after checking the normality of data distribution and the homogeneity of variances across the groups, results for the ANCOVA indicated that there was no statistically significant difference in post-test pronunciation intelligibility scores between the experimental and the control groups. The researcher constructed a linear model of pronunciation intelligibility means of the experimental and control groups as a function of using the application. This model was not significant ( $F(1,17)=2.75, p=,0.12, \eta^2=0.14$ ). The apparent high post-test means of the experimental group resulted from their initial difference rather than the treatment type (Figure 10).

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**Figure 10**

*Line plot indicating pronunciation intelligibility scores of both groups in the pre and post-tests*



### 4.3. Research Question 3

The researcher distributed the motivation survey during the online post-test session to address the third question of this study, concerning the correlation between motivation for pronunciation learning and using MAPT-tools. The data was analyzed through the following procedure.

First, the reliability of the motivation questionnaire was examined through Cronbach Alpha. During the initial analysis, it was found that item 5 (I would like to spend much time studying English during the week because I think studying English is important to travel internationally.) had a negative correlation with total value; as a result, it was removed from the analyses for the research question. This might be because, as opposed to the other sensitive preliminaries required for traveling internationally from Iran, L2 learning is less challenging for the participants. This interpretation is confirmed by the fact that students tended to agree on motivation factors indicating ideal L2 self and instrumentality. After

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removing Item 5, the alpha value was ( $\alpha = .92$ ), indicating that the questionnaire was highly reliable.

The first glance at both groups' reactions to the motivation survey indicated that 50% of the subjects in both experimental and control groups did not have prior experience of using a MAPT-tool. However, the data analysis on the questionnaire indicated that 100% of the participants (40% strongly agreed, 20% agreed, and 40% slightly agreed) agreed that MAPT-tools on mobile phones makes L2 learning more accessible and interesting (50% strongly agreed, 30% agreed, and 20% slightly agreed) in response to questions 16 and 10 respectively. Also, 100% of the subjects (50% strongly agreed, 25% agreed, and 25% slightly agreed) agreed that MAPT tools on mobile phones positively affect pronunciation enhancement required for further education in response to question 12. Moreover, 90% of the participants (30% strongly agreed, 25% agreed, and 35% slightly agreed) agreed to pay the required costs for downloading a MAPT-tool answering question 15. Meanwhile, in response to question number 8, the data revealed that 100% of participants (40% strongly agreed, 40% agreed, and 20% slightly agreed) believed using language learning applications on mobile phones have facilitated accessing English language pronunciation learning sources, while 85% of the total subjects in both groups (50% strongly agreed, 30% agreed, and 5% slightly agreed) were interested in using a MAPT-tool for pronunciation enhancement in response to question 17. Based on the survey, all participants indicated to be 100% (60% strongly agreed, 15% agreed, and 25% slightly agreed) motivated for learning reliable pronunciation in response to question 7.

Furthermore, the third question addressing the correlation between motivation for pronunciation learning and using MAPT-tools was investigated through running a separate Pearson correlation between motivation and pronunciation post-test scores for each group (experimental, control). Results showed no significant correlation between motivation for

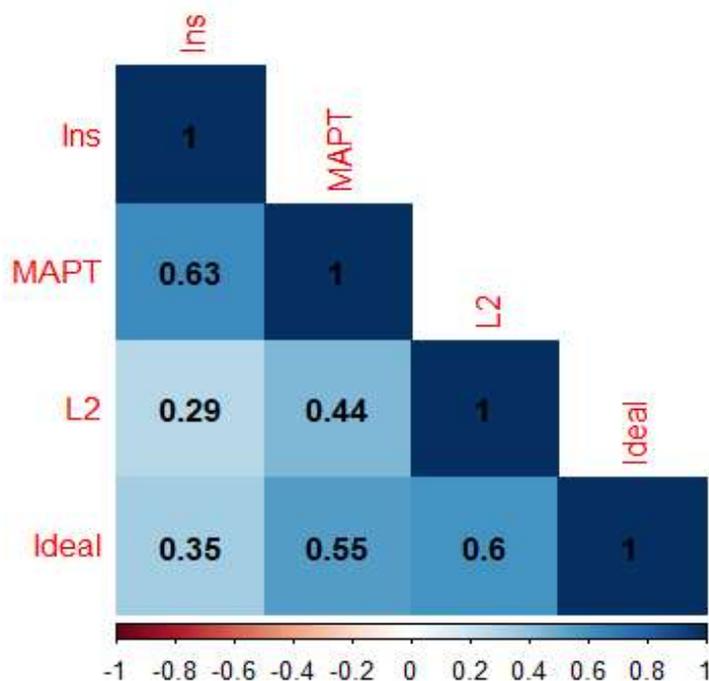
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pronunciation learning and using MAPT-tools in experimental and control groups. In fact, a Pearson  $r$  analysis showed that motivation for pronunciation learning and using MAPT-tools in the experimental group ( $r(8) = .23; p = .50$ ), and control group ( $r(8) = .25; .996; p = .48$ ) were not significantly related.

Furthermore, both groups' reactions were investigated to find more information concerning the motivation factors involved in L2 pronunciation learning and using MAPT-tools according to both groups. Due to the limited number of questions, only two questions targeted *ought to motivation* factors for L2 learning in the questionnaire. As noted above, one of the questions (item 5) was extracted prior. However, data analysis indicated that 40% of the participants in both groups were strongly agreed in response to the second item related to ought to factors (i.e., question number 13: Studying English is important to me because other people will respect me more if I have a knowledge of English.). Subsequently, other factors – referring to attitudes to L2 (L2), ideal L2 self (Ideal), instrumentality (ins), and attitudes to using MAPT-tools (MAPT)- were investigated in each group separately.

The correlation matrix analyzing the mean scores of all factors targeted by the questionnaire revealed that participants' motivation for learning L2 is strongly positive in both groups related to how they view the ideal L2 self ( $r=.60, p<.01$ ). However, the visualized data through correlation matrix suggested that those participants interested in using MAPT-tools ( $r=.63, p<.01$ ) tapped into the same aspect of motivation in both groups. Meanwhile, the factor concerning attitudes to L2 learning has the lowest correlation with the instrumentality in this small size sample group with such a limited number of questions (Figure 11 and Table 2).

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**Figure 11***Visualizing correlation matrix of motivation survey***Table 2***Indicating data in the correlation matrix*

	Attitudes to L2	Ideal L2 self	Instrumentality	Attitudes to MAPT
Attitudes to L2	1.00	0.60	0.29	0.44
Ideal L2 self	0.60	1.00	0.35	0.55
Instrumentality	0.29	0.35	1.00	0.63
Attitudes to MAPT	0.44	0.55	0.63	1.00

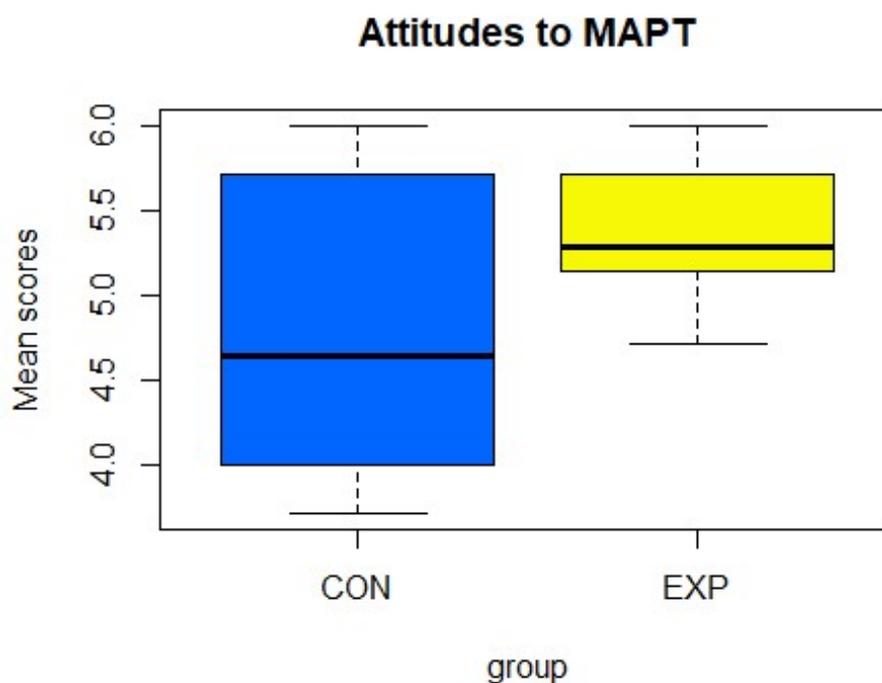
In response to question 3.1 in this study, the subjects in both experimental (EXP) and control (CON) groups were investigated to compare their motivational factors separately. Although indicating a higher range for the control group, the visualized average data in the box plot comparing the potential differences in both groups' motivation means for using MAPT-tools indicated that the experimental group ( $M=5.365$ ,  $SD = .463$ ) on average showed a higher motivation than the control group ( $M=4.800$ ,  $SD = 0.865$ ) (Figure12). The cause

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might be due to participation in the experiment for using the app, which increased the level of motivation for using MAPT-tools.

**Figure 12**

*Boxplot visualizing the distribution of means scores for experimental and control groups concerning attitudes to MAPT.*

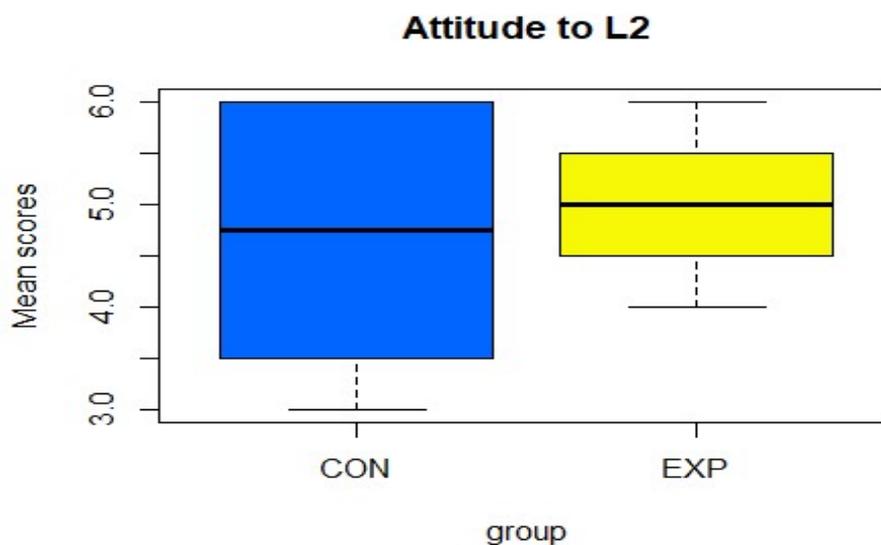


Moreover, despite the larger range for the control group, the mean dispersion concerning attitudes to L2 in the experimental group ( $M=4.944$ ,  $SD = .726$ ) is slightly above the control group ( $M=4.650$ ,  $SD = 1.17$ ), which is visualized in Figure 13.

**Figure 13**

*Boxplot visualizing the distribution of means scores for experimental and control groups concerning attitudes to L2.*

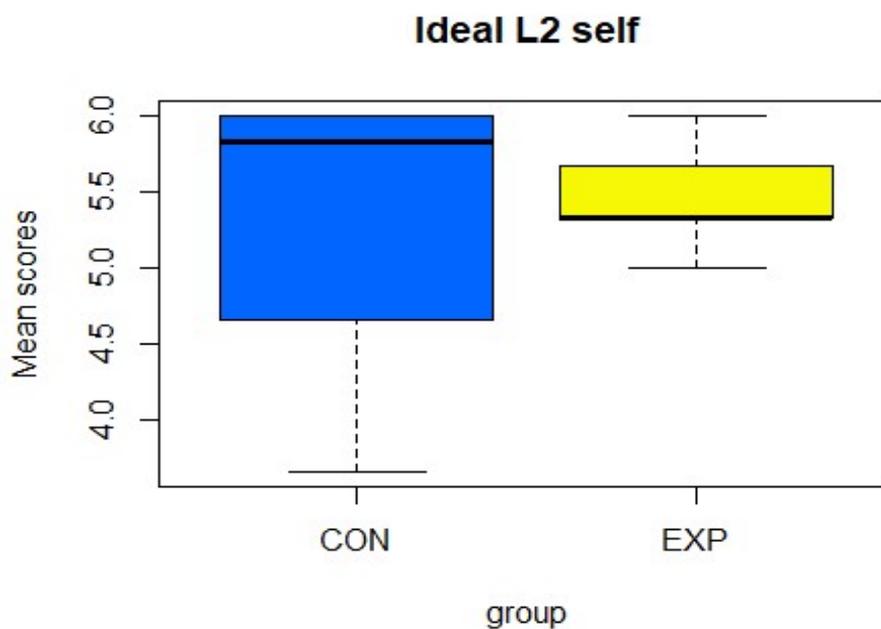
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In addition, based on the visualized data in Figure 14, the motivation factor concerning the ideal L2 self for the experimental group ( $M=5.518$ ,  $SD = 0.337$ ) is slightly higher than the control group ( $M=5.333$ ,  $SD = .902$ ).

**Figure 14**

*Boxplot visualizing the distribution of means scores for experimental and control groups concerning ideal L2 self.*

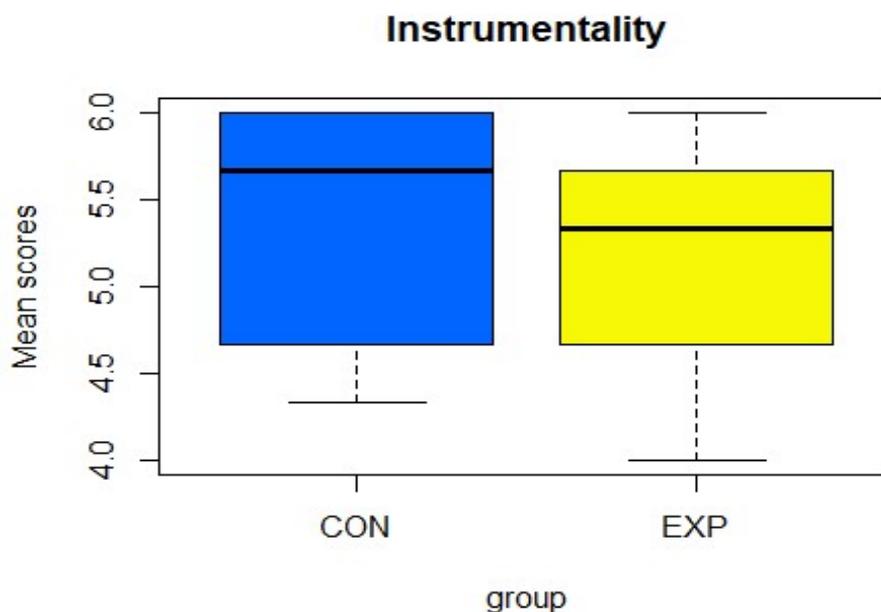


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However, the trend is slightly different for motivation factors concerning instrumentality in both groups. Here, the control group ( $M=5.400$ ,  $SD = .681$ ) has slightly surpassed the experimental group ( $M=5.037$ ,  $SD = .734$ ) as shown in Figure 15.

**Figure 15**

*Boxplot visualizing the distribution of means scores for experimental and control groups concerning instrumentality.*



All statistical descriptions are summarized in table 3.

**Table 3**

*A summary of the results of the tests*

Factor	M (Exp.)	sd (Exp.)	M (Con.)	sd (Con.)	t	df	p
Attitudes to L2	4.944	0.726	4.650	1.179	-0.662	15.155	0.517
Ideal L2 self	5.518	0.337	5.333	0.902	-0.603	11.702	0.557
Instrumentality	5.037	0.734	5.400	0.681	1.112	16.426	0.281
MAPT	5.365	0.463	4.800	0.865	-1.794	14.450	0.093

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### 5. Discussion

Recent linguistic studies have investigated the effect of using mobile phones and pronunciation learning applications to enhance L2 learning pronunciation. However, the present study aimed to deepen our understanding of using MAPT-tools and extend the use of mobile phones for pronunciation training settings based on a task-based cycle to find more innovative ways to increase pronunciation proficiency and learners' autonomy. Noting the previously reported constraints, the findings of this study pose exciting implications for foreign language pronunciation teaching and learning using a TBLT based MAPT-tool and the correlation between intermediate students' motivation factors for pronunciation learning and using a MAPT tool in the Iranian context.

In response to the first research question, proceeding with interrater reliability, the average score on data analysis displayed the experimental groups' accuracy progress in terms of target consonants (/θ/, /w/) addressed in this study. Based on the statistical results, the participants' performance significantly increased by using a task-based MAPT-tool compared to the control group in pronunciation accuracy enhancement. The reason might be because the authentic and clear explicit explanation on suprasegmental features of speech and provided visual feedback (e.g., Hardison, 2004) incorporated into communicative tasks led to improved pronunciation accuracy through dual-focused oral communication tasks (Morely, 1994).

In addition, respecting individual requirements and differences and mentioning the shared segments in L1 and L2 phonemic inventories through the use of contrastive analysis techniques (Arroyo Hernández, 2009; Hammerly, 1982), presented features in the app contributed to increasing learners' awareness of the differences between both languages more systematically (Hung, 1993). Moreover, focusing on L1 and L2 subtle phonetic contrasts (de Bot et al., 2005) and input enhancement (Bongaerts et al., 1997) could develop pronunciation accuracy. The high degree of substitution of targeted consonants reported by Nosratinia and

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Zaker (2014) and the diversity of mother tongues in Iran –even in this small sample- are discussed earlier. Subsequently, mentioning differences in consonantal distribution (Bakhtiarvand, 2008) through the available videos in the app provided more opportunities to elaborate on mispronounced L2 consonants that do not exist in L1. Indeed, explicit instruction and more exposure to L2 through the task cycle could be one of the reasons which contributed to accuracy improvement among the participants in the experimental group. Here, the gap concerning mispronunciation and replacement of L2 sounds which do not exist in L1, reported by Ajabshir (2018), was pursued. Consequently, the treatment could help the pronunciation accuracy problem of those students interested in further education, which Mirhassanin (2003) addressed in his study. In other words, the MAPT-tool could help to prevent assimilation and fossilization issues. Here, the control group performance might be affected by assimilation, resulting in lower scores in replacing the absent sounds of English with those present in Persian. As far as accuracy was concerned, the raters reported that most of the subjects mispronounced consonants /θ/ and /w/ in the control group, which affected accuracy. This result proved the findings reported in previous studies once more.

Subsequently, concerning “Window of Maximal Opportunity” in L2 learning (Derwing & Murray, 2015), the control group might need direct and explicit instruction by the app or active exposure to such task cycles outside the classroom (Kenworthy, 1990) to practice pronunciation more accurately. Besides, in line with highlighting the critical role of teachers (Jager, 2009), instructors might have a sound knowledge of the nature of pronunciation instruction or teaching *phonology for listening* (Rixon, 2014:296) and *streaming speech* (Cauldwell, 2003) which might affect pronunciation accuracy reinforcement in regular classes. The reason might be even lack of efficient primary input source and explicit integration of pronunciation training, besides providing individual feedback in a regular format for pronunciation training in the course syllabus. Pourhosein Gilakjani (2016) proved

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the significance of L2 teachers' pronunciation knowledge and students' positive reaction to receiving immediate feedback to preserve self-confidence in social interactions (Pourhosein Gilakjani, 2012). The app facilitated receiving individual feedback wherever possible (Derwing & Murray, 2015) by using ASP during the task cycles, and pronunciation instruction was prompted through workplan focusing on meaning and learners' linguistic resources for task completion (Gordon, 2021:96). Thus, learners could easily achieve proper immediate feedback and positive pronunciation reinforcement using the task-based MAPT-tool.

Moreover, the integral part of communication embedded in the task-based MAPT-tool provided more opportunities to practice pronunciation in meaningful task-based activities. From the dynamic perspective viewpoints, the continuous interaction between the meaningful tasks and the learner during the pre-task, main-task, and post-task ample opportunities for phonological development and practice. Subsequently, due to the increasing primary source of *input*, not only acquisition of morphemes was predicted through the frequency of input (Larsen-Freeman, 1976), but also student's authority for practicing reliable pronunciation had increased in an out-of-class activity. Noting that "each individual has his own language system" (de Bot et al., 2005:14), the complex interaction of involved factors in the task-cycle could contribute to pronunciation enhancement for those students whose L2 pronunciation was affected by their mother tongues in a dynamic process (de Bot et al., 2005). Also, the reason might be the flexibility of practicing with the MAPT-tool and increasing students' autonomy which contributes to decoding individual sounds as the minimal unit of sound within the learning syllabus. In addition, this was in line with phonemic system development (de Bot et al., 2005) through the integration of phonological and pronunciation instruction into the learning process. As a further matter, presenting a short cycle of relevant task-based activities through focus on form and reviewing "comprehensible output" (Nobuyoshi & Ellis,

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1993) could contribute to usage-based through task repetition in a meaningful context.

Subsequently, “actual development” within the “zone of proximal development” (Vygotsky, 1978: 85) could be promoted for learning and remembering targeted consonants. As such, rather than focusing on forms (Long, 2015), a balance between form and meaning might be formed to affect the individual student’s language system.

In essence, students had the chance to increase their confidence regarding pronunciation proficiency through task repetition during the pre-main- and post-task cycle. Moreover, the primary focus of *workplan* was on meaning to allow the subjects to rely on their own linguistic resources for completion (Gordon, 2021:96). It is important to note that some participants were not confident enough to consider themselves at the intermediate level in the self-reported demographic section of the questionnaire. One might refer to this as one limitation of the study. However, unconsciously the reason might be due to lack of enough self-confidence for pronunciation proficiency, discussed in this study. It is important to note that all the subjects were eligible to pass the entrance requirement for the university, and the course level was identified for intermediate learners. The result is in line with filling the gap reported in previous findings related to lack of attention for pronunciation learning (Pourhosein Gilakjani & Ahmadi, 2011), pronunciation instruction, and correction feedback in Iran which might be due to L2 teachers’ lack of confidence and knowledge in pronunciation teaching (Foote et al., 2011) or lack of scheduled pronunciation training in the syllabus. Perhaps, noting the effect of understandable pronunciation on functional intelligibility and increased self-confidence (Morley, 1991), as indicated by Pourhosein Gilakjani (2016), learners’ accent is suggested to be close to a standard norm. The findings call for more exposure to L2 learning content, which could be followed through using MAPT tools as an out-of-class activity.

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However, in response to the second question in terms of intelligibility enhancement, although the mean score of pre-test and post-test of the experimental group was slightly higher than the control group, the results on data analysis found statistically insignificant differences among participants in both groups. Although the experimental group slightly improved, the initial difference posed a difference rather than using the MAPT-tools as the type of treatment in this study. The results were not far from expectations, especially noticing the level of participants. However, concerning the “superiority of the Intelligibility Principles” (Levis, 2005), it was investigated to see if receiving the utterances in communicative tasks could increase the chance of intelligibility in producing and distinguishing the message. This small sample study indicated that there is seemingly no significant enhancement to intermediate learners in short-term training when it comes to the intelligibility of the individual’s speech. This supports the previous findings by Loukina et al. (2015) that mispronounced words can remain intelligible in about half of all cases. As stated earlier, speech intelligibility and communication comprehension are affected by factors including stress and intonational features. Moreover, the flexibility of the human listener (Scharenborg, 2007) assists comprehensible communication (Fraser, 2000). In addition, the result might be due to the embedded task-cycle targeting intelligibility. Besides the small sample and short study period, it might be considered the limitations of the present study to be replicated for a larger group and extended tasks focusing on intelligibility in a more extended period for further studies.

In addition, it was expected that providing immediate direct feedback through ASR could prevent *fossilization* and the formation of unreliable pronunciation habits. Once the learner had received the “natural communicative input” (Krashen, 1985) due to being involved with task cycle and stages, the corresponding processor stage was expected to resemble the whole system’s processing model, which effectively affected the individual’s

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dynamic learning systems. Here, the L2 learner had the chance of being involved in the integration of ordinary pedagogy and using task-based MAPT-tools to enhance pronunciation through interactive tasks and “a focus on cognitive processes such as attention and recall” (de Bot et al., 2005: 181) as an extra-curricular activity. However, it seems that to increase intelligibility and prevent consistent confusion of target consonant pairs (/v/, /w/- /θ/, /t/) for Iranian EFL learners, a larger sample is required to test the idea. Further studies could draw attention to developing communicative and meaningful tasks focusing on suprasegmental features and holistic characteristics of pronunciation proficiency to increase speech intelligibility besides accuracy.

In response to the third research question, the motivation survey was conducted at the post-test sessions for both groups to trace each participants' individual viewpoints regarding motivation for pronunciation improvement and using MAPT-tools. Subsequently, due to conducting online post-test sessions, a limited number of questions (17 items) were covered in an adjusted survey study based on the study by Taguchi et al. (2009). However, after checking the internal reliability of the motivation questionnaire, the results suggested that both experimental and control groups were encouraged to improve their pronunciation proficiency and use MAPT-tools. Indeed, as the data analysis on the questionnaire indicated, participants in both groups were highly motivated to improve their pronunciation proficiency and had positive attitudes towards using a MAPT-tool. This was in line with the previous findings in Arashnia and Shahrokhi (2016) study according to positive attitudes for using mobile applications for L2 learning concerning pre-intermediate Iranian EFL learners. The reason might be the availability of mobile applications and the increased autonomy of the learners in using these tools as out-of-class activities. Concerning the involved motivation factors including attitudes to L2 learning, ideal L2 self, ought to L2 self, instrumentality, and attitudes to MAPT-tools discussed in this survey, although half of the subjects in both

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experimental and control groups did not have a prior experience of using a MAPT-tool; all of them believed MAPT-tools on mobile phones have facilitated accessing L2 pronunciation learning sources and make L2 learning more interesting and easier. The findings reflect the potential motivation for using MAPT-tools as out-of-class learning sources, which increased the chance of accuracy enhancement and the level of exposure to authentic and reliable learning material, which was easily accessible for the learners. Expanded pronunciation learning options through using technology in a safe environment (Banafa, 2008), respecting individual differences, increased students' autonomy (Benson, 2011). Moreover, contextualized meaningful and relevant learning tasks besides the researcher's initial guidance (Jager, 2009) could increase the experimental group's performance in addressing the first question.

Furthermore, after experiencing the introduced task-based MAPT- tool in this study, the motivation factors involved in the adjusted motivation survey study were considered to investigate the criteria for each participant in both groups. Although both groups were interested in using MAPT tools, the participants in the experimental group proved to have a higher motivation than the control group for using such apps. The motivation level of these learners could be considered one other factor that affected the experimental group's better performance in terms of pronunciation accuracy. It seems that the positive experience of using the introduced app resulted in a higher motivation for the experimental group. Moreover, their attitudes to L2 learning might have been affected by the experience of using the app because the experimental group indicated a higher motivation towards attitude to L2 learning than the control group. However, factors regarding the ideal L2 self and instrumentality of the control groups' participants indicated higher motivation than the experimental group.

Generally, both groups were motivated in pronunciation learning and using MAPT-tools so that the motivation went even beyond individuals' efforts in the experimental group

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for using VPN for overcoming filtering issues to access app features in Iran. This might be considered another limitation of this study that highly affected the number of participants in the experimental group due to finding and installing a proper VPN to access the app. Despite these problems, the participants were inspired and motivated to participate in the study, as in line with findings in the motivation survey, it seems the benefits outweigh the disadvantages.

In addition to the noted limitations to the present study, due to the Covid 19 pandemic and targeting the participants in Iran, the researcher had to face several challenges to carry out the experiment in person. One crucial drawback of conducting this online experiment was recruiting participants who had regular online classes. As such, this made finding a potential class arguably difficult, but it also made reaching volunteer subjects' participation in pre-and post-test harder. Moreover, although most subjects were interested in participating in the study, the experimental group's subjects could not follow the study because of limitations in downloading the app due to filtering issues and using a VPN. This resulted in numerous practical difficulties and constant negotiations with the app's company, and extra effort in defining database and email addresses to solve the downloading problem. Inevitably, all these challenges led to small sample size. Despite 150 interested students at the initial stages of the study, only 65 students could participate in the pre-test, and ten of them could download the app to be considered the experimental group. Also, eighteen continued to participate in the post-test to be considered the control group. However, considering the quality of the recorded audio files, only ten could be assessed as the post-tests for the control group in the final step.

Trying into this, is the short period of sharing information about the MAPT-tool, considering a limited number of targeted consonants, and conducting the post-test in week three. Nevertheless, a longer period for taking more targeted consonants may have allowed for more profound insight, especially into the intelligibility of pronunciation. This was avoided to prevent losing track of the participants or danger of disconnection from the online MAPT-

## **TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY**

tool. A clear limitation of the present study is the small size of participating and accessing the selected app in this online study. Had subjects been recruited mainly by approaching offline classes or the app been extensively available, the closer connection would have been with the researcher, and a longer time frame could have been considered. With everything being conducted online, the researcher had to run a short online survey with a limited number of questions to receive participants' feedback in individual online meetings. This required scheduling several meetings and setting several reminders for individual participants for the post-test, which was scheduled at the exact time frame in the third week. Finally, finding raters as native speakers and professional L2 speakers in a limited time was another challenge in this study. Considering limitations for offline meetings, sharing views, and discussing rating scales was another issue to be addressed. Consequently, out of 5 rates, only one native speaker and one professional speaker could join the researcher to analyse the recorded audio files.

### **6. Conclusion**

In conclusion, neglecting pronunciation instruction has resulted in the lack of pronunciation proficiency among Iranian EFL learners. Obviously, pronunciation accuracy and intelligibility play undeniable roles in communication, whereas pronunciation instruction and proficiency are underestimated in Iran. The problem could be mainly due to the gap in pronunciation instruction and the implementation of practical methods in the pedagogical content. The current study explored the benefit of using a TBLT MAPT-tool for speech accuracy and intelligibility improvement. Moreover, the study investigated the correlation among motivation for pronunciation learning and using MAPT-tools in the intermediate Iranian EFL context.

Noting the results from previous findings by Arashnia and Shahrokhi (2016) in terms of the potential effectiveness of pronunciation instruction through mobile phones for pre-

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intermediate EFL learners, as well as the study by Lee (2021) indicating the effectiveness of using a MAPT tool for increasing pronunciation proficiency of lower intermediate Korean learners in terms of English vowels, the present study sought to deepen our understanding about enhancing pronunciation accuracy and intelligibility through targeting two of previously reported challenging consonants (/θ/, /w/) in the intermediate level. However, to fill the gap concerning the understanding of MAPT-tools effectiveness in terms of consonants production -in line with practical aspects of meaning-based task pronunciation instruction based on TBLT- this study aimed to extend using MAPT tools in the frame of TBLT. As such, a task-based MAPT-tool was provided to extend the potential benefit of such tools based on usage-based task cycles. Therefore, the study aimed at investigating whether the use of a task-based MAPT-tool may be beneficial in terms of increasing accuracy in pronunciation of problematic consonant (/θ/, /w/) as well as improving intelligibility, besides investigating the correlation among motivation for pronunciation learning and using MAPT-tools among Iranian EFL learners in three research questions.

Despite the availability of many APT apps for mobile phones, first, an application with potential specifications for pronunciation development was selected. Then, the researcher discussed and suggested a series of activities based on the TBLT task-cycle with the founder and technical team of the company to be implemented in the app. Based on the approval and positive drawbacks, the communicative tasks were published in a series of task-based activities, including pre-main-post- task activities. Thus, the task-based MAPT-tool was prepared to be implemented in this study.

An online experiment was conducted to perform the study: twenty intermediate L2 participants were randomly and equally considered into experimental and control groups. In the beginning, the instructor conducted individual pre-tests to receive audio files from both groups' participants. Then, the researcher provided premium access to the app for the

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experimental group based on their email addresses and contact numbers. Subsequently, the researcher shared the experimental group a short introduction in a WhatsApp group, explaining the topic of the study and some screenshots for relevant pronunciation instructions to ensure that the subjects followed the same routine. Students in the experimental group practiced targeted consonants including /θ/ and /w/ respectively in two weeks through the designed task cycle as an out-of-class activity on their own. In contrast, the control group spent their regular classes with the same routine of pronunciation correction feedback by the instructor whenever necessary in online classes. In week three, the participants in both groups were invited to participate in individual online post-tests through individual google meet sessions with the researcher. The post-test included a second reading aloud activity from a similar short passage and responding to an online motivation survey during individual live sessions.

The comparison of both groups' performances in the audio recordings for pre-and post-tests by the raters clearly indicated considerable advantages to using task-based MAPT-tools to increase pronunciation accuracy for those targeted consonants. Although intelligibility was not significantly improved, the data on the administered motivation survey clearly supported motivation for pronunciation learning and using MAPT tools in the Iranian context.

The data supported the first research question concerning the significant effectiveness of task-based MAPT-tools on pronunciation accuracy development. In response to the second research question regarding intelligibility progress, the scores in pre-and-post tests were not significant. The reason might be the level of the participants, the result of the pre-test, the features involved in the incomprehensibility of communication concerning Intelligibility Principles, and the flexibility of human rating in a short passage. Moreover, rather than the initial difference between experimental and control groups and their proficiency levels as

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intermediate learners, one likely explanation for such a result might be the short treatment period and a small sample of the participants. Moreover, the effectiveness of the embedded task cycle and the app could be tested with a larger sample over a more extended period. In response to the third question of this study, although the correlation between motivation for pronunciation learning and using MAPT tools was not significant in experimental and control groups, the subjects in both groups were indicated to be highly motivated for pronunciation learning and using MAPT tools. This motivation even went further for the experimental group who had the opportunity of using the suggested MAPT tool in this study.

Based on the findings of this study, it is inferred that there has been a keen interest in using MAPT-tools for learning L2 pronunciation among intermediate Iranian EFL learners. Additionally, pronunciation accuracy can be significantly increased through the task-based MAPT-tool used in this study as an out-of-class activity. Regarding reported concerns about pronunciation problems in the Iranian L2 context in previous studies and findings of the present study, task-based MAPT-tools can be incorporated into the pedagogy as an out-of-class activity to enhance pronunciation proficiency. Both groups' performances revealed that MAPT tools could be used as out-of-class activities to promote pronunciation training as flexible and reliable tools. The innovative practices by teachers may highly contribute to the pronunciation proficiency of the learners to fill the gap reported in previous studies. Especially, noting the significant results in improvement of pronunciation accuracy, teachers may adopt TBLT MAPT-tools as out-of-class training sources for pronunciation proficiency enhancement which does not require direct supervision. As such, reliable MAPT-tools may serve as educational tools for increasing students' autonomy concerning pronunciation training. This notion may be more relevant in learning contexts with fewer L2 exposure and communication opportunities. Subsequently, mispronunciation and incorrect pronunciation

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habits, resulting in fossilization and decreasing intelligibility, could be prevented and controlled.

However, considering the limitations of reaching out to participants, this study offered a glimpse into the proposed questions. Further research could investigate the potential benefit of using task-based MAPT- tools in a larger sample. Moreover, other reported challenging sounds (/ð/, /ɔ/, /ɪ/) could be investigated regarding speech accuracy and intelligibility improvement over a longer period. The benefits of using MAPT-tools and embedding meaningful task-based in MAPT-tools could be explored in a larger context with more communicative tasks. The current study could serve as a pilot investigation for future studies with a larger sample size to explore more innovative and integrative methods for providing flexible out-of-class activities for increasing L2 learners' autonomy as a critical factor in pronunciation learning. The researcher suggested a framework integrating TBLT and MAPT tools because learners can ideally benefit from communicative tasks in a usage-based cycle and technological developments. Hopefully, the study has provided some information for implementing innovative pronunciation learning methods and an integrative approach in the pedagogy.

**TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY****Appendix A: English Passage for Pre-test**

Please call Stella. Ask her to bring these things with her from the store: Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob. We also need a small plastic snake and a big toy frog for the kids. She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.

**TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY****Appendix B: English Passage for Post-test**

This woman has a new baby. Her name is Ruth. The baby's name is Theo. Ruth buys many things for Theo. When she is at the drugstore, she buys this and that. When she is at the mall, she buys this and that. Theo's date of birth is May 6, 2009. Ruth wanted Theo's birthday to happen in Spring. Ruth's favourite month is May. Theo is her first baby.

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### Appendix C: English Version of Adjusted Motivation Survey

This survey is conducted understanding the thoughts and beliefs of Iranian English learners for their language and pronunciation learning via mobile applications. This questionnaire consists of two sections. Please read each instruction and chose your answers. This is not a test so there are no “right” or “wrong” answers and you do not even have to write your name on it. The results of this survey will be used only for research purposes so please give your answers sincerely. Thank you very much for your help!

#### Part I

*In this part, we would like you to tell us how much you agree or disagree with the following statements by simply choosing a number from 1 to 6. Please do not leave out any of items.*

Strongly Disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1	2	3	4	5	6

*(Example) If you strongly agree with the following statement, write this:*

I like skiing very much.		1	2	3	4	5	6
1	I enjoy studying English.	1	2	3	4	5	6
2	I can imagine myself speaking English as if I were a native speaker of English.	1	2	3	4	5	6
3	Studying English helps me to find a good job with a good salary in the future.	1	2	3	4	5	6
4	I am ready to spend money to study English.	1	2	3	4	5	6
5	I would like to spend a lot of time studying English during the week because I think studying English is important to travel internationally.	1	2	3	4	5	6
6	I imagine a day speaking English like a native speaker.	1	2	3	4	5	6
7	I care about learning reliable pronunciation because I like to speak English with a reliable pronunciation.	1	2	3	4	5	6
8	Using language learning applications on mobile phones have facilitated accessing English language pronunciation learning sources.	1	2	3	4	5	6

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9	Using language learning applications for improving my English pronunciation proficiency helps to prevent getting bad marks in English classes.	1	2	3	4	5	6
10	It is more interesting to learning reliable English pronunciation through using mobile assisted language learning applications.	1	2	3	4	5	6
11	Mobile assisted English language learning applications make English language pronunciation learning easier.	1	2	3	4	5	6
12	English language learning applications on mobile phones have a positive effect on pronunciation learning required for further education.	1	2	3	4	5	6
13	Studying English is important to me because other people will respect me more if I have a knowledge of English.	1	2	3	4	5	6
14	I like using language learning applications for learning reliable pronunciation.	1	2	3	4	5	6
15	I will spend money on the language learning application which improves my pronunciation proficiency.	1	2	3	4	5	6
16	English language learning applications which can be downloaded on mobile phones make learning English easier.	1	2	3	4	5	6
17	I like to improve my pronunciation through using English language pronunciation applications on mobile phones.	1	2	3	4	5	6

## Part II

Please provide the following information by *ticking (✓) in the box or writing your response in the space.*

**Gender:**  Male  Female  Prefer not to mention

**Nationality:**

**Age:**

**Education:** \_\_\_\_\_

**Job:** \_\_\_\_\_

**English ability:** *Please rate your current overall proficiency in English by ticking one.*

**Upper Intermediate level and over**—Able to converse about general matters of daily life and topics of one's specialty and grasp the gist of lectures and broadcasts. Able to read high-level materials such as newspapers and write about personal ideas.

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- Intermediate level** —Able to converse about general matters of daily life. Able to read general materials related to daily life and write simple passages.
- Lower Intermediate level** — Able to converse about familiar daily topics. Able to read materials about familiar everyday topics and write simple letters.
- Post-Beginner level**—Able to hold a simple conversation such as greeting and introducing someone. Able to read simple materials and write a simple passage in elementary English.
- Beginner level** — Able to give simple greetings using set words and phrases. Able to read simple sentences, grasp the gist of short passages, and to write a simple sentence in basic English.

**Other Languages:** *Do you speak any other languages rather than Persian and English?*

*Yes*  *No*

**Using language learning applications:** *Have you ever used English language learning mobile applications for practicing pronunciation proficiency before this experience?*

*Yes*  *No*

**Thank you for your cooperation!**

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## Appendix D: Online Persian Version of Adjusted Motivation Survey

Screenshots asking questions 1 to 17 and demographic information of participants are presented.

Figure D1

## Explanations

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

علاقه مندی به استفاده از اپلیکیشن برای تقویت مهارت تلفظ زبان انگلیسی

با سیاست، این پرسشنامه تنها به منظور گردآوری نظرات شما در رابطه با استفاده از اپلیکیشن های زبان آموزی برای پیشرفت در مهارت تلفظ کلمات در زبان انگلیسی، طراحی شده است و به منزله آزمون نمی باشد. لطفا سوالات را مطالعه کرده و میزان موافقت یا عدم موافقت خود را اعلام فرمایید.

به عنوان مثال اگر شما در پاسخ به سوالی مشابه سوال زیر کاملا موافق هستید به این ترتیب پاسخ را انتخاب فرمایید.

\* من اسکی را بسیار دوست دارم.  
کاملا مخالفم.  
مخالفم.  
تا حدودی مخالفم.  
تا حدودی موافقم.  
موافقم.  
کاملا موافقم.\*

شروع

Figure D2

## Question 1

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱. من از یادگیری زبان انگلیسی لذت می برم.\*

کاملا مخالفم. ۱

مخالفم. ۲

تا حدودی مخالفم. ۳

تا حدودی موافقم. ۴

موافقم. ۵

کاملا موافقم. ۶

پاسخ داده شده : ۰ از ۲۳

بعدی

Figure D3

## Question 2

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۲. روزی را تصور می کنم که انگلیسی را همچون یک انگلیسی زبان صحبت خواهم کرد.\*

کاملا مخالفم. ۱

مخالفم. ۲

تا حدودی مخالفم. ۳

تا حدودی موافقم. ۴

موافقم. ۵

کاملا موافقم. ۶

پاسخ داده شده : ۰ از ۲۳

قبلی

بعدی

Figure D4

## Question 3

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۳. یادگیری زبان انگلیسی به پیدا کردن شغل با درآمد مناسب در آینده به من کمک میکند.\*

کاملا مخالفم. ۱

مخالفم. ۲

تا حدودی مخالفم. ۳

تا حدودی موافقم. ۴

موافقم. ۵

کاملا موافقم. ۶

پاسخ داده شده : ۰ از ۲۳

قبلی

بعدی

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

Figure D5

## Question 4

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۴. حاضرم برای یادگیری زبان انگلیسی، هزینه های لازم را پردازم.\*

کاملاً مخالفم	۱	مخالفم	۲
تأخیری مخالفم	۳	تأخیری موافقم	۴
موافقم	۵	کاملاً موافقم	۶

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D6

## Question 5

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۵. دوست دارم زمان زیادی را در هفته صرف آموختن زبان انگلیسی کنم چون فکر میکنم یادگیری زبان انگلیسی برای مسافرت های بین المللی مهم است.\*

کاملاً مخالفم	۱	مخالفم	۲
تأخیری مخالفم	۳	تأخیری موافقم	۴
موافقم	۵	کاملاً موافقم	۶

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D7

## Question 6

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۶. روزی را تصور میکنم که انگلیسی را همچون یک انگلیسی زبان صحبت کنم.\*

کاملاً مخالفم	۱	مخالفم	۲
تأخیری مخالفم	۳	تأخیری موافقم	۴
موافقم	۵	کاملاً موافقم	۶

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D8

## Question 7

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۷. من به یادگیری تلفظ صحیح کلمات اهمیت میدهم چون دوست دارم زبان انگلیسی را با تلفظ صحیح صحبت کنم.\*

کاملاً مخالفم	۱	مخالفم	۲
تأخیری مخالفم	۳	تأخیری موافقم	۴
موافقم	۵	کاملاً موافقم	۶

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

Figure D9

## Question 8

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۸. استفاده از اپلیکیشن های آموزش زبان که روی موبایل نصب می شوند، دسترسی به منابع یادگیری زبان انگلیسی را ساده تر کرده است.

\*  
 ۱. کاملاً مخالفم  
 ۲. مخالفم  
 ۳. تا حدودی مخالفم  
 ۴. تا حدودی موافقم  
 ۵. موافقم  
 ۶. کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳  
 مشاهده یا برطرف کردن  
 قبلی بعدی

Figure D10

## Question 9

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۹. استفاده از اپلیکیشن های آموزش زبان برای تقویت مهارت تلفظ کمک میکند تا نمره بدی در کلاس انگلیسی نگیرم.

\*  
 ۱. کاملاً مخالفم  
 ۲. مخالفم  
 ۳. تا حدودی مخالفم  
 ۴. تا حدودی موافقم  
 ۵. موافقم  
 ۶. کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳  
 مشاهده یا برطرف کردن  
 قبلی بعدی

Figure D11

## Question 10

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۰. یادگیری تلفظ صحیح با استفاده از پلیکیشن های زبان انگلیسی که روی موبایل نصب می شوند جالب تر است.

\*  
 ۱. کاملاً مخالفم  
 ۲. مخالفم  
 ۳. تا حدودی مخالفم  
 ۴. تا حدودی موافقم  
 ۵. موافقم  
 ۶. کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳  
 مشاهده یا برطرف کردن  
 قبلی بعدی

Figure D12

## Question 11

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۱. اپلیکیشن های زبان انگلیسی که روی موبایل نصب می شوند، یادگیری تلفظ لغات در زبان انگلیسی را راحت تر میکنند.

\*  
 ۱. کاملاً مخالفم  
 ۲. مخالفم  
 ۳. تا حدودی مخالفم  
 ۴. تا حدودی موافقم  
 ۵. موافقم  
 ۶. کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳  
 مشاهده یا برطرف کردن  
 قبلی بعدی

Figure D13

## Question 12

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۲. اپلیکیشن های آموزش تلفظ زبان انگلیسی که روی موبایل نصب می شوند، در یادگیری تلفظ زبان انگلیسی برای ادامه تحصیل تاثیر مثبتی دارند. \*

مخالفم	کاملاً مخالفم
تأخیری موافقم	تأخیری مخالفم
کاملاً موافقم	موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D14

## Question 13

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۳. یادگیری زبان انگلیسی برای من مهم است زیرا با داشتن دانش زبان انگلیسی مردم بیشتر به من احترام میگذارند. \*

مخالفم	کاملاً مخالفم
تأخیری موافقم	تأخیری مخالفم
کاملاً موافقم	موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D15

## Question 14

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۴. من دوست دارم برای یادگیری تلفظ صحیح کلمات انگلیسی، از اپلیکیشن های آموزشی استفاده کنم. \*

مخالفم	کاملاً مخالفم
تأخیری موافقم	تأخیری مخالفم
کاملاً موافقم	موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D16

## Question 15

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۵. من برای دریافت آن اپلیکیشن آموزش زبانی که باعث پیشرفت تلفظ انگلیسی من بشود، هزینه های لازم را خواهم پرداخت. \*

مخالفم	کاملاً مخالفم
تأخیری موافقم	تأخیری مخالفم
کاملاً موافقم	موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

Figure D17

## Question 16

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۶. اپلیکیشن های زبان انگلیسی که روی موبایل نصب می شوند، یادگیری انگلیسی را راحت تر میکنند.\*

۱ کاملاً مخالفم

۲ مخالفم

۳ تا حدودی مخالفم

۴ تا حدودی موافقم

۵ موافقم

۶ کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D18

## Question 17

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

۱۷. من دوست دارم با استفاده از اپلیکیشن های آموزش تلفظ زبان انگلیسی که روی موبایل نصب میشوند مهارت تلفظ خود را تقویت کنم.\*

۱ کاملاً مخالفم

۲ مخالفم

۳ تا حدودی مخالفم

۴ تا حدودی موافقم

۵ موافقم

۶ کاملاً موافقم

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D19

## Asking demographic questions concerning gender

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

جنسیت

۱ زن

۲ مرد

۳ ترجیحا این سوال را پاسخ نمی دهم.

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

Figure D20

## Asking demographic questions concerning educational status

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

وضعیت تحصیلی و شغلی

محل درج پاسخ ...

پاسخ داده شده : ۰ از ۲۳

قبلی بعدی

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

Figure D21

*Asking age*

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

سن \*

پاسخ داده شده : ۰ از ۲۳

پیشرو

قبلی

بعدی

Figure D22

*Asking English education background*

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

لطفا سطح کنونی توانایی زبان انگلیسی خود را ارزیابی کنید \*

۱] مبتدی: دارای توانایی سلام و احوال پرسی کردن با استفاده از عبارات ساده و مشخص. دارای توانایی خواندن و نوشتن جملات ساده

۲] فر مبتدی: دارای توانایی مکالمه های ساده (احوال پرسی و معرفی دیگران) و توانایی خواندن و نوشتن متون ساده

۳] پیش متوسط: دارای توانایی گفتگو درباره مسائل روزانه خانوادگی - خواندن متون روزمره و آشنا و نوشتن نامه های ساده

۴] متوسط: دارای توانایی گفتگو در مورد موضوعات روزمره و توانایی خواندن متون عمومی و نوشتن متون ساده

۵] فر متوسط: دارای توانایی گفتگو در مورد موضوعات عمومی روزمره و موضوعات مربوط به تخصص خود فهمیدن چکیده سخنرانیها و خواندن [ ] متون سطح بالا مانند مجلات و روزنامه های

پاسخ داده شده : ۰ از ۲۳

پیشرو

قبلی

بعدی

Figure D23

*Asking linguistic background*

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

آیا شما بغیر از زبان فارسی و انگلیسی به زبان دیگری هم صحبت می کنید؟ \*

محل درج پاسخ ...

پاسخ داده شده : ۰ از ۲۳

پیشرو

قبلی

بعدی

Figure D24

*Asking previous experience for using MAPT tools*

این پرسشنامه غیرفعال است و امکان ثبت پاسخ ندارد.

آیا تا قبل از شروع این تحقیق از اپلیکیشن های آموزش زبان انگلیسی برای پیشرفت مهارت تلفظ استفاده کرده بودید؟ \*

۱] خیر

۲] نه

پاسخ داده شده : ۰ از ۲۳

پیشرو

قبلی

بعدی

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

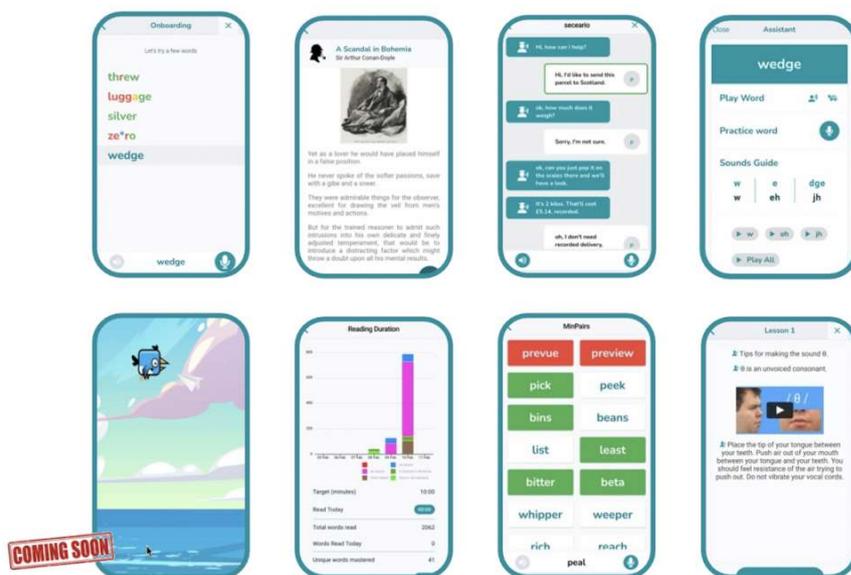
### Appendix E: Operational Description

Articulate is developed as an application for oral production promotion of English language learning students (level A2 / B2 of the CEFR). The application can be downloaded through Google Play Store for Android and IOS devices.

To access the app features, users can join the application in four primary environments, including home, library, practice, and lessons. The app features in the Version used in this study include individual word practice, book reading, instant feedback, video tutorials, minimal pairs, assistant, conversation scenarios, social media log in, and games (Figure E1).

**Figure E1.**

#### *Application features*



#### Setting the stage - Towards pronunciation practice for new vocabularies

In order to set the stage for pronunciation practice for the correct articulation of words according to the Task-based language teaching (TBLT) approach, the application suggests evaluating and practicing correct pronunciation with a British accent according to active

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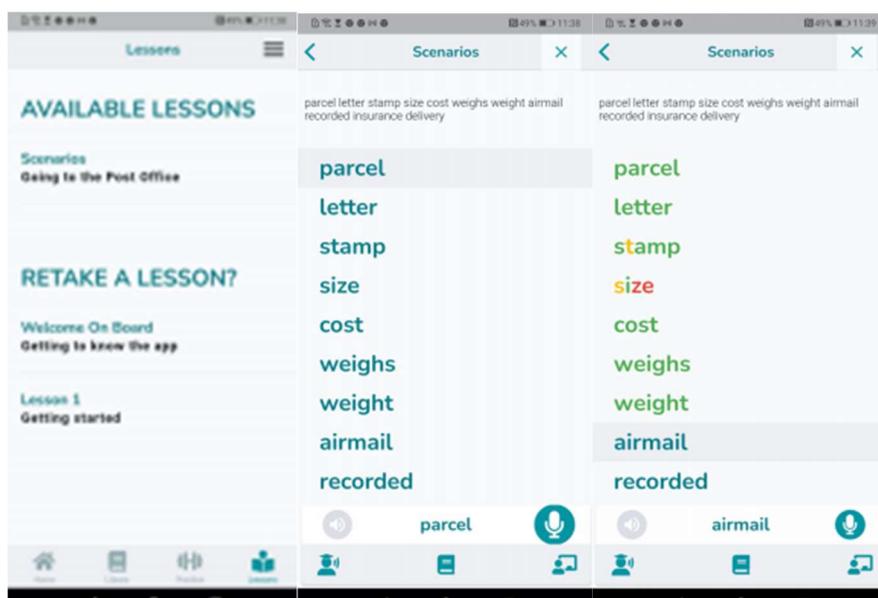
reading vocabulary and conversational tasks in a series of lessons. Three phases, including pre-task, main-task, and post-task.

### 1. Pre-task

The application has suggested starting the pre-task by checking the pronunciation of isolated vocabularies and a careful pronunciation practice of new words to get the user involved in knowing what they will learn (Del et al., 2010). This sequence will start through the pre-task by app user's engagement with pronouncing a list of words that will be preceded by practicing the same vocabularies in a cohesive short conversation during the main task to provide the opportunity for receiving individual training individual involvement on a certain pronunciation task. The app user will launch the situational language lesson in a scenario by practicing a list of words before entering the situation as a pre-task. The lesson can be clearly followed, and it starts with pronunciation practices for the key vocabularies. The tutor is there, as the referee, for further pronunciation practice (Figure 2).

**Figure E2.**

*Screenshot for pre-task activity*



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At this step, the app users are asked to record themselves saying each word to receive instant feedback with colours for each letter and listen to the reference tutor's voice. They can use the dictionary to look up word meanings while practicing correct pronunciation, and at this phase, an assistant is available to break the word down. Once all the words have been recorded/attempted, the scenario will open as the main task.

### 2. Main-task

In order to get the app users motivated to continue with the application, there are a limited number of short phrases based on everyday conversational topics to get students involved with the main idea and smooth switching between different key strategies for active pronunciation practice.

Moreover, students not only get intrinsically motivated to know about the flow of information but also extrinsically get interested in finding the answers to the questions to be discussed explicitly through the further proceeding stages. Therefore, while tapping the students' motivation, the application can activate their prior knowledge of students and create a link to further information (Dale et al., 2010).

The rationale for each lesson is related to correct pronunciation practice through analysing, interpreting, pronouncing, and evaluating the correct pronunciation of a list of relevant vocabularies in a short conversation and the focal point is on focusing on effective, active, and correct articulation of vocabularies according to the British accent. This brings about the opportunity for careful consideration of task complexity and types of implemented language used in task-based interaction. (Ellis, 2003; Samuda et al., 2008; Moore, 2018). To involve the students' minds to start working on the learning theme, *activation of prior knowledge* or *activating existing knowledge* can create a context for the further flow of information (Dale et al., 2010). Through pre-task pronunciation activity, the app users got

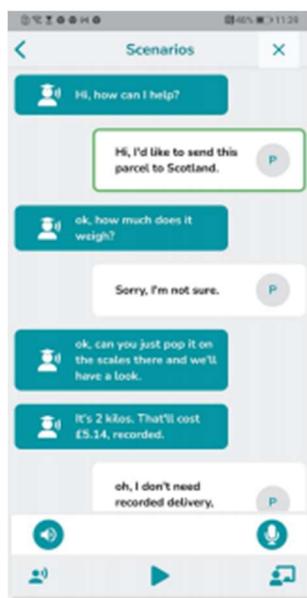
## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

focused and familiar with the type of application to focus on the task and improve their native-like pronunciation.

Then they refer to a relevant conversation, which is presented in the proceeding dialogue based on a situation, for matching and linking the vocabularies to the relevant situation in the conversation by repeating the pronunciation practice. Such activity will level up motivation and interest by preparing visual support (Del et al., 2010), which brings the learners to get to know what they want to learn in 10 minutes. At this phase, the app user is asked to tap the green box to start listening to the tutor reading aloud their part in the scenario. (Figure 3)

### Figure E3.

*Screenshot for main-task activity*



The app users are asked to tap a white box and record their part in the scenario at this stage. The app allows them to listen to their recording and re-do it. In case of any requirements, the tutor is available to read the section, and at the end, the app user can press the large arrow to play the entire recording and listen to the whole scenario.

The main task is designed as a comprehensive task to relate students' prior individual knowledge at the pre-task stage and learning experiences to the new learning context in the

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

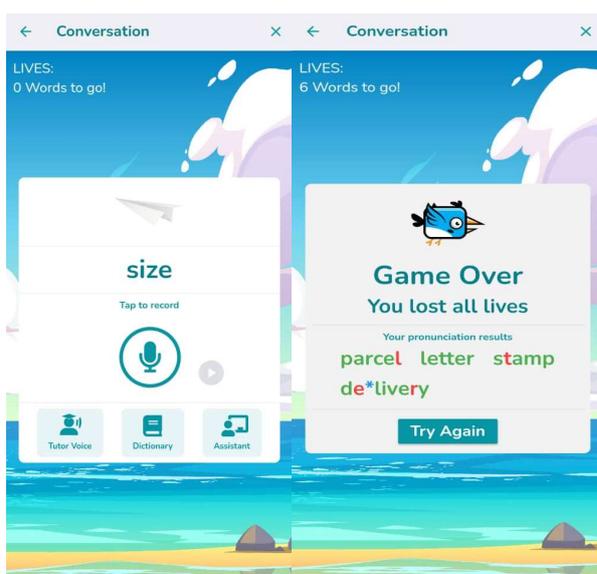
main task stage. By asking the app users to carry out tasks individually, the application activates the prior knowledge, associating the previous knowledge and linking it to the correct pronunciation practice required at this level. Through the application's explicit feedback, the app users will start thinking about the specifications of the correct pronunciation of the relevant vocabularies in a relevant short conversation based on situational language teaching, which is necessary to process and internalize the information which proceeds. So that they can link their prior knowledge to the new materials while increasing their intercultural awareness, as they will not succeed in learning in a stable vacuum environment.

### 3. Post-task

Once the app user is done with one situation scenario, there is an opportunity for pronunciation practice tasks for rehearsal and finishing the learning cycle through gamification. The final activity in this part is designed to bring up an opportunity for learning reinforcement, which would consequently promote and develop the learning process effectively (Figure 4).

#### Figure E4.

*Screenshot for post-task activity*



## **TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY**

Such an opportunity would promote pronunciation practice of new vocabularies in the context through speech recognition and analysis by immediate feedback.

The app user can only access the main task after finishing the pre-task. This means that the app user will start with the pre-task to continue with the main and post tasks. At the final post-task activity, there would be a chance to review the scenario and introduce vocabulary. The final task includes reviewing pronunciation practice of a limited number of vocabularies introduced in each scenario to reinforce the tutorial and learning process. Consequently, the task repetition cycle can effectively contribute to the learning process to further reinforce the pedagogical principles.

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

### Appendix F: Rating Scale for Speech Sound Accuracy and Intelligibility in Pre-test

This survey is conducted to investigate the accuracy and intelligibility of producing two English consonants (/w/, /θ/) by Iranian English learners reading the short sample passage at the pre-test. This questionnaire consists of two parts. Please read each instruction and write your answers. This survey will be used only for research purposes, so please give your answers sincerely. Thank you very much for your help!

#### Part I

*In this part, I would like you to listen to the audio from the pre-test concerning reading aloud the below passage. Please circle the number that, in your judgment, best correlates with the corresponding speech characteristic according to the mentioned vocabularies.*

Please call Stella. Ask her to bring these things with her from the store: Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob. We also need a small plastic snake and a big toy frog for the kids. She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.

#### Rating scale for /θ/

There is not a noticeable difference in quality.	There is a noticeable difference in quality.
<b>1</b>	<b>0</b>

*(Example) If the correct sound is presented in the following vocabulary, circle this:*

Rating	/θ/	Rating scale
	thing	<input checked="" type="radio"/> 0
1	things	1 0
2	with	1 0
3	thick	1 0
4	things	1 0
5	three	1 0

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

## Rating scale for /w/

1	with	1 0
2	we	1 0
3	we	1 0
4	will	1 0
5	Wednesday	1 0

## Part II

*In this part please rate speech intelligibility. Please choose the answer according to the level of intelligibility of pronounced vocabularies according to the relevant utterances in audio files.*

## Rating scale for intelligibility of utterances.

Speech is consistently unintelligible to familiar and unfamiliar listeners.	Speech is frequently unintelligible when listener and/or content is unfamiliar.	Speech is occasionally unintelligible when listener and/or content is unfamiliar.	Speech is intelligible even when listener and/or content is unfamiliar.	Speech is consistently intelligible to familiar and unfamiliar listeners.
<b>1</b> <b>0-20%</b>	<b>2</b> <b>20-40%</b>	<b>3</b> <b>40-60%</b>	<b>4</b> <b>60-80%</b>	<b>5</b> <b>80-100%</b>

*(Example) If the correct sound is presented in the following vocabulary, circle this:*

Utterance	Rating scale
Ask her to bring these things with her from the store.	1 2 3 4 <b>5</b>
1 Ask her to bring these things with her from the store	1 2 3 4 5
2 Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob.	1 2 3 4 5
3 We also need a small plastic snake and a big toy frog for the kids.	1 2 3 4 5
4 She can scoop these things into three red bags	1 2 3 4 5
5 We will go meet her Wednesday at the train station.	1 2 3 4 5

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

### Appendix G: Rating Scale for Speech Sound Accuracy and Intelligibility in Post-test

This survey is conducted to investigate the accuracy and intelligibility of producing two English consonants (/ w/, /θ/) by Iranian English learners reading the sample short passage at the post-test. This questionnaire consists of two parts. Please read each instruction and write your answers. This survey will be used only for research purposes, so please give your answers sincerely. Thank you very much for your help!

#### Part I

*In this part, I would like you to listen to the audio from the post-test concerning reading aloud the below passage. Please circle the number that, in your judgment, best correlates with the corresponding speech characteristic according to the mentioned vocabularies.*

This woman has a new baby. Her name is Ruth. The baby's name is Theo. Ruth buys many things for Theo. When she is at the drugstore, she buys this and that. When she is at the mall, she buys this and that. Theo's date of birth is May 6, 2009. Ruth wanted Theo's birthday to happen in Spring. Ruth's favourite month is May. Theo is her first baby.

#### Rating scale for /θ/

There is not a noticeable difference in quality.		There is a noticeable difference in quality.	
1		0	
1	Ruth	1	0
2	Theo	1	0
3	things	1	0
4	birth	1	0
5	Sixth	1	0
6	Two thousand and nine	1	0
7	month	1	0

#### Rating scale for / w/

1	woman	1	0
---	-------	---	---

## TOWARDS MAPT-INTEGRATED PRONUNCIATION PROFICIENCY

2	when	1 0
3	when	1 0
4	wanted	1 0

## Part II

*In this part please rate speech intelligibility. Please choose the answer according to the level of intelligibility of pronounced vocabularies according to the relevant utterances in audio files.*

## Rating scale for intelligibility of utterances.

Speech is consistently unintelligible to familiar and unfamiliar listeners.	Speech is frequently unintelligible when listener and/or content is unfamiliar.	Speech is occasionally unintelligible when listener and/or content is unfamiliar.	Speech is intelligible even when listener and/or content is unfamiliar.	Speech is consistently intelligible to familiar and unfamiliar listeners.
1 0-20%	2 20-40%	3 40-60%	4 60-80%	5 80-100%
1	This woman has a new baby.		1 2 3 4 5	
2	Her name is Ruth.		1 2 3 4 5	
3	The baby's name is Theo.		1 2 3 4 5	
4	Ruth buys many things for Theo.		1 2 3 4 5	
5	When she is at the drugstore, she buys this and that.		1 2 3 4 5	
6	When she is at the mall, she buys this and that.		1 2 3 4 5	
7	Theo's date of birth is May 6, 2009.		1 2 3 4 5	
8	Ruth wanted Theo's birthday to happen in Spring.		1 2 3 4 5	
9	Ruth's favorite month is May.		1 2 3 4 5	
10	Theo is her first baby.		1 2 3 4 5	

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