Reviewing the potentials of Mobile Media and Learning

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Abstract

Media technology presented in handheld devices, like mobile smartphones and tablets, enables the integration of immersive reality (Genlott et al., 2019). Kugler (2017) predicted that this will be at the forefront of mobile language learning. Taking a media studies approach, this thesis addresses the question of how mobile apps facilitate the engagement of independent language learners.

Classical studies have restricted communication in learning traditionally in direct interaction between the knowledge provider and the learner in a fixed physical location. By introducing media technology to this setting, learning as a process of communication may adapt and change. New media products have emerged in the edutainment, e-learning and interactive learning markets (Okan, 2003). In other fields, mobile media apps offer features that may extend the horizon of engagement, as learners can immerse themselves in a semi-artificial world. Different mobile learning apps are also following this new technological trend of integrating engaging features into their design. This integration may pave the way for alternative possibilities for transforming learning.

Learning a new language, is a multi-layered skill, and a challenge for any learner. For independent learners, additional factors can further complicate the task, such as social, financial and time constraints. These perceived restrictions may create a gap in pursuing continuous learning. Therefore, a systematic overview on learning as engagement with mobile media may initiate a better comprehension and assessment of the dynamic potentials of digital media.

Review on digital media and language learning started typically by Stern (1975) and Rubin (1975) centred on distinguishing the approaches undertaken by successful learners to make it available to less prosperous learners. As Nambiar reflected in 2009, nearly all the study participants from this 1970s research were adults of various nationalities (Nambiar, 2009) and they showed a sequence of characteristics and learning tactics used by proficient language learners. Rubin's well-cited first study in 1975 identified the following qualities employed by language learners:

- Enthusiastic and correct guesser, comfortable with doubt.
- Attempting to communicate and to acquire via communication.
- Finding tactics to overcome stumbling blocks in objective language interaction.
- Rehearsing the language at any available opportunity.
- Supervising their oral communication and others' speech.
- Addressing language patterns, that is, descriptive linguistics: persistently analysing, synthesising and categorising.
- Being keen on the meaning.

Naiman (1978) added 25 supplementary tactics, but these did not deviate significantly from the above. They distinguished the most often used tactics by proficient language learners who employ the vast resources available to native speakers, such as listening to the radio, records, movies, TV, commercials and excessive reading of magazines, professional articles, newspapers, and comics. These learners added to their repertoire bilingual vocabulary display charts and memorising tem and communicating with native speaker acquaintances. Stern's (1975) research also showed specific tactics that enhanced learners' intuition in the mental process. The essential thing to recognise regarding the list is that proficient

language learners do not use similar language learning approaches, and where they use similar strategies, it may not be for the same aims.

Language learning may be far more complex than other skill acquisition. Language skill can be obtained by continuous practising and assembling new knowledge, through building relationships inside and outside the classroom. It is a skill that requires time and place (Iglesias Rodríguez et al., 2017), thus, they suggest that language learning "involves groups of learners working together to solve a problem, complete a task, or create a product" (p. 665). The Common European Model sets six proficiency levels in a language (Council of Europe, 2001). Each level encompasses the following skills: reading, listening comprehension, speaking and writing. Typically, a learner will focus on one particular form while studying and writing; others achieve the same through speaking and listening. While the former learner centres on forms from a general perspective, the latter learner is much more analytical and pays keen attention to little details linked with the rules and forms. No single set of tactics applies to all learners or exercises. Learners learn which tactics are efficient for their own process of language skill acquisition.

The investigation of personalised learning environments unveils the concept of placing the learning back in the learners' hands. Bray and McClaskey (2015) observed that when learners take charge of their study, they gain inspiration to pioneer their personalised learning. A learner's interest in study exercises is relevant. However, it does not ensure that learners will gain the forms of knowledge that will aid in new learning (Donovan et al., 1999). As learners, in whichever subject, personalise their study and their goals, they have a chance to develop reliable aims and may demonstrate skilful knowledge by their selections. Progress response offers learners both the skills of mastery and the awareness of the shortfalls of non-mastery, such as not being able to fulfil of their goals. The information

permits students to write out studying knowledge requisites. The goals then become an accomplishment plan, through which the learners experience a sense of achievement.

Personalising learning makes learners invest in their learning and passion by shifting the classical paradigm from teacher-dictated learning plans to learner-oriented plans. When learners become in control and personalise their study aims, they adjust their pace and employ several approaches and tactics in parallel to attain their learning goals (Bray & McClaskey, 2015). The movement to personalisation motivates teachers to be flexible and transparent so that learners become more oriented and hence more empowered within their learning process (Bray & McClaskey, 2015). Personalised learning thus demands more than a change in the paradigm. It requires the integration of modern individualised media technology.

Grant and Basye (2014) revealed that personalisation and independence in learning may inspire instructors to take advantage of the opportunities of the digital techniques that most learners are already utilising. Employing technology may integrate conventional classroom settings with online learning opportunities, whereas learners might become more empowered within their studies by controlling pace, time and location. Twenty-first-century learners can share, cooperate and gain knowledge from their multidimensional environment: peers, tutors and digital access to knowledge. Personalised learning and digital access to online resources may push learners towards self-direction and independence in learning. The integration of media technology aims to provide learners with the desired standards, and assist the skills they possess or have not yet mastered, set personalised goals and eventually come up with several personalised tactics for achieving their learning goals.

An overview

Nowadays learners draw inspiration and motivation from new technological forms because of their upbringing in the digital era (Hardika et al., 2020). Most learners nowadays engage with media communication technology daily, such as with social networking, texting and web browsing. Learners perceive the various kinds of technological devices to be essential and extremely enjoyable. Learners who are familiar with, and accustomed to, the novel forms of media technologies will eventually want to employ these technologies in the learning environment. If their learning activities require new technology that mirrors how they use technology in the real world, they will advance in their learning progress (Burbules et al., 2020). Scialdone and Zhang (2013) also support this argument: they claim that individuals may interact with computers, for the purpose of assessment, design and execution of communicative computing systems, and for individual use or for learning about a significant phenomenon around them. With regard to this perspective, the two key elements of new media utilisation in learning are people and computer-assisted technology. The interaction study regards how one or more aspects of these two factors interact for a specific function within a particular context, such as language learning.

Learning a language skill by integrating new media technology may centre on physical abilities, demographic characteristics or psychological aspects. The definition of technology is broad to encompass various features based on software, hardware, information and data processing and applications. However, smart technology interaction looks specifically at the design, adoption and impact (Zhang et al., 2009). The psychological aspect may look at the level of engagement with the proposed technology.

Elements for consideration

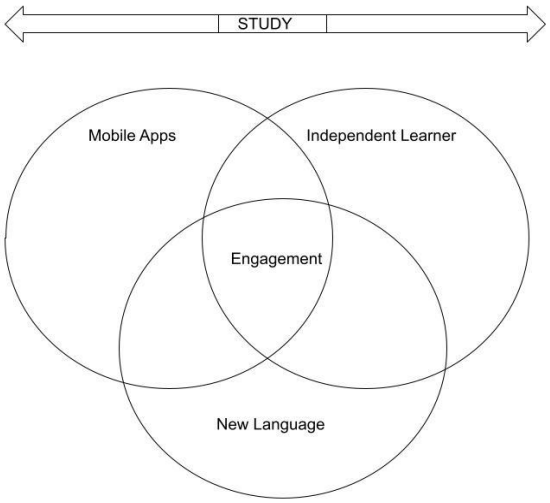
To effectively explore this subject, the current study proposes a multidisciplinary investigational approach, ideally to investigate the possibilities of integrating new media within the learning process. It proposes that learners equipped with technological media for interaction may enhance their engagement. The condition is to focus on the design and make a comprehensive impact through integrating the three key elements: human, technology and skill, all respectively.

Human refers to independent learners.

Technology refers to the media technology: mobile apps.

Skill refers to language acquisition.

Figure 1: Elements of the Study



According to this illustration, media mobile apps and skill acquisition, like language learning, may work in harmony if employed in a useful and engaging context.

Perceived usefulness is a fundamental element when looking into the application and impact on adult learning (King, 2017). The upper bidirectional arrow shows that the study design has a continuous focus on learning while underlining the use and impact of mobile apps. Therefore, the design regards new media technology characteristics that adult learners can interact and engage with within mobile learning. At the intersection of three key elements lies the engagement; I do not intend such classification to induce one element as superior over another. Instead, I propose that the engagement happens when learners are motivated to learn while utilising new media technology.

Mobile media

With new media in the context of mobile applications, most learning apps available for download are free at the point of download, while some are subject to a fee. Mobile apps, like any software, are modified and made downloadable to any mobile device, whether a mobile phone, tablet or laptop computer. Initially, mobile apps development was for daily information retrieval and general matters of productivity, such as a weather forecast, calendar, e-mail or alarm clock. Simultaneously, public needs and available developer tools triggered quick expansion to other fields, hence learning and education, games and entertainment. The first mobile apps surfaced with the first smartphone evolution known as 'IBM Simon' in 1994 (Aamoth, 2014). It had ten apps: a calendar, an address book, a filer, a calculator, a fax app, a notepad, a mail app, a sketch pad, a to-do-list app and a time app. Compared to contemporary standards back then, it was perceived as too much information to handle, but it was a revolutionary product in the technology market at that time. However, it took over 13 years until 2007, when the rapid development of mobile apps gained momentum. The quality of mobile apps continued to rise, as their utilisation became increasingly predominant across smart gadgets and tablet device users.

Mobile media and language learning

By moving fast forward regarding the breadth and depth of the investigation elements represented in Figure 1, the key element of mobile media independent learning can be defined in this research as having the capacity to choose to acquire a skill through utilising media technology. Mobile learning is seen as efficient at enhancing educational outcomes since it enhances the opportunity to acquire education and advance personalised, ubiquitous and collaborative learning, which is learner centred (Bai, 2019). The process was hence customised according to the learners' goals, time, place and pace of learning. However, earlier research emphasised the mobile aspects where it characterised learning as ubiquitous via mobile wireless information systems (Virtanen et al., 2018).

Here the backing technology in media learning encompasses any new types of hand-held mobile devices like smartphones, pads, personal digital assistants and tablets (Genlott et al., 2019). This raises the issue of accessibility and whether every learner possesses a mobile device. Only six years ago, 68% of American adults possessed a mobile phone, and 45% possessed a tablet, according to the 2015 Pew Research Centre (Anderson, 2015), but 86% of younger adults between the age of 18 and 29 had a mobile phone. Radicati claimed in the same year that the number of mobile phone users worldwide was above 5.6 billion, and that by 2018 the number would increase to over 6.2 billion (2015). Statista affirmed that the number of mobile phone users in 2020 was 6.95 billion and predicted that it would be 7.1 billion by 2021 (O'Dea, 2020a).

Mobile phone accessibility rates are increasing, and the emerging nations are rising at an astonishing rate, from an average of 21% to 37% from 2013 to 2015 (Poushter

& Stewart, 2016). But it is not evenly spread. Laura Silver, discussing the findings of the 2018 PEW survey, said that "a median of 76% across 18 advanced economies surveyed have smartphones, compared with a median of only 45% in emerging economies" (Silver, 2019). Recently, as production begins to recover from the first effects of the Covid-19 pandemic, global smartphone sales are predicted, like other industries to grow from 2020 to 2021. Nearly 87% of all mobile users in the United States are expected to own a smartphone by 2025, in contrast to the only 27% recorded in 2010 (Statista, 2021).

Challenges of mobile media and language learning

Mobile learning is increasingly being accepted as an effective learning strategy for creating highly engaging learning experiences, according to growing evidence. However, mobile language learning challenges lie in three domains: the physical, educational and psychosocial fields (Bachore, 2015). Physical issues concern screen size, input methods, storage capacity, processor speed and battery life. Most of these are common limitations found in previous research. Consequently, most of the research recommendations are based on providing affordable gadgets which maximise the technology. On the other hand, the psychosocial aspects are regarded as exploring the social features or impact of mobile learning. While we primarily share laptops or desktop computers for formal studying or work-related purposes, mobile gadgets lean towards personal, customised and socially interactive or related purposes. The capacity of mobiles to connect via social platforms to other individuals, with more profound knowledge and a common language of interest, heightens the users' interaction.

Jarvis and Achilleos (2013) proposed that any operation in which a user uses a computer to work on language enhancement is called 'computer-assisted language learning' (CALL). The term 'CALL' became recognised in language education at

the beginning of the 1980s. Initially, the field was confined to desktop computers with a couple of basic software programs. However, the field grew to include online websites, video blogs, digital courses, online learning platforms and applications, among others. The constant development in mobile technology led to their inclusion, opening a field termed 'mobile-assisted language learning' (MALL). MALL is applicable in official and unofficial new education in foreign languages (Kukulska-Hulme, 2009). MALL evolved from CALL and shifted the focus on to personalised attributes, emphasising the continuity of accessibility on portable devices that created new opportunities for learning. MALL is regarded as a comparatively new research domain, although individuals have been interacting with their personal mobile devices for a long time (Hoi, 2020). The main edge MALL provides compared to conventional face-to-face learning or skill acquisition is the flexibility that this type of learning offers. This gives the learner the capacity for accessing time for learning and additional interactivity affordances that increase connectivity and language learning possibilities.

Language learning through the lens of prospect technology: 5G Technology.

Consumer demands are influencing the growth of broadband services such as 5G. The projected rise in digital traffic is estimated to be between 10 and 100 times between 2020 and 2030, and the rise in the number of devices and services, along with a demand for enhanced user experience and affordability, will need innovative interventions (ITU, 2019). Connected devices on the web may reach 50 billion users any time from 2025 onwards. With 5G Internet access and Wi-Fi, modern portable devices may offer language learners involvement in meaningful real-time data exchange and interactions, often lacking in the current 4G networks and conventional learning platforms. Thus, mobile language learning may change its current characteristics from a limited individual-based privileged learning, evolving to a collective multi-learning method inclusive experience.

Digital media, learning and efficiency

Empirical studies noticed that mobile devices with language learning applications may stand as sufficient language tools for learners. By looking into the efficiency, for instance, Azar and Nasiri (2014) discovered that mobile learning enhanced learners' listening skills. The study addressed learners' perception of MALL's efficiency in their audio comprehension and discovered that Iranian learners studying English perceived the applications as a rather practical learning process. The efficiency, in an alternative study, came from the assistance of technology in accessing the study materials, which may happen at anytime and anywhere. Alemi, Anani and Lari (2012) looked at mobile language learning from a fresh perspective, in which they studied the impact of sending and exchanging short text messages that included foreign words. In their study, they focused on various aspects, such as

meanings, sentences, vocabulary choices and study memory retention. The results showed that, in the short term, there was no relevant distinction between studying vocabulary through the exchange of short-text SMS messages and using a dictionary. However, in terms of long-term retention, vocabulary acquired through SMS messages was recalled better than via the conventional dictionary-learning approach.

MALL has various appreciated merits (Krivoruchko et al., 2015). A mobile device is readily available, portable and relatively cheap. Therefore, they regarded mobile learning, as access with much ease to the studying material. Personalisation, control over time and place, self-testing and relatively quicker feedback were considered as the highest merits of MALL. It is an appealing and interactive process that increases learners' inspiration and encourages them to learn (Ciampa, 2014).

Digital media, learning and cultural implications

From a different standpoint, Viberg and Grönlund (2013) researched Swedish and Chinese students and looked into whether gender, age or cultural components would affect their mobile technology use for learning a foreign language. The study discovered that attitudes linked to skills adoption and technology acculturation, such as individualism and mobility, amongst others, were more relevant for learners' attitudes and conduct than attitudes linked to traditional, local and domestic cultures. Chen and deNoyelles (2013) looked into how Chinese learners use tablet computers in foreign language learning, particularly outside the classroom. The study found that the tablets are tools for developing a collaborative, interactive and accessible

platform for language study, regardless of a minor indifference on the part of some students. They gave a positive response to both utilisation and efficiency.

At a different location, a similar study performed in Taiwan of 58 school students in their second year in college assessed their end-of-term results. The study compared mobile media active learners and solely traditional student learners. Students who had minimal experience engaging with mobile learning underwent an additional English course (Yang, 2014). The results concluded that learners felt mobile media allowed them to gain more information than a traditional class set-up and endorsed institutional learning. Many students pointed out that mobile learning devices coupled with task-based assignments heightened their inspiration, and learning English was more enjoyable. Steel (2012) analysed students' views on the merits of using mobile applications in learning a second language in an Australian university. The study observed that the capacity to exercise a language anytime and anywhere matched the students' busy and eventful lifestyles with convenience and flexibility. The students also held the way of studying to be affordable for vocabulary acquisition, grammar, reading and writing skills.

From the previously investigated studies I can assume that mobile learning, generally, provided a positive outcome in the view of the subjects who underwent the studies. They revealed a level of satisfaction with the process of learning a language with a mobile intervention and confirmed its efficiency. However, these studies regarded their population as students in a classroom environment, whilst disregarding the social implications of the presence of the teacher and their fellow peers. This notion may strengthen my curiosity to look at this subject by excluding the potential implications of the findings. I would like to explore the way learners reflect on their mobile learning independently. I assume that studying independent

learners who use mobile language apps autonomously may produce objective and original findings.

Mobile apps on a global scale

A mobile app (application) is computer software designed to work on mobile devices like phones and tablets, among others (Tracy, 2012). Apps are available via application digital distribution space often termed as the 'App Market'. This is controlled by the operating-system owner, such as, most commonly: Google Play, Apple Store, BlackBerry World and Windows Phone Store. The two dominating app markets are Google Play for Android operating system devices, and Apple Store for iOS operating devices. The Apple App Store was the first app market and set the standard for app download services. Previously, mobile apps were built-in software features. Later, Microsoft and Google joined these digital app market platforms with their own application operating systems (Callahan, 2019). Afterwards, phenomenal growth of the app markets occurred. Currently, based on households, approximately 95% of all residents of the UK own a mobile phone (O'Dea, 2020b). The growing quantity of available apps on the market also supports these statistics. In the current decade, the number of apps has grown at a significantly higher rate than the growth of mobile phone ownership.

Globally, as per the digital stores, Android users have a choice of 3.48 million apps, as of the first quarter of 2021. This makes it the app store with the most available apps. With over 2.22 million iOS apps available, the Apple Store comes second. However, the precise number of applications is constantly changing, as both stores

eliminate low-quality material on a daily basis. Meanwhile, the total number of applications has been continuously expanding over time (Statista, 2021).

Mobile apps' popularity prevalence eventually emerged amongst learners. Almost all students download apps to their mobile smartphones. Ataş and Çelik's (2019) situational analysis of smartphone usage prevalence among university students found that university students in developing countries spent over four hours on several apps on their devices daily. Their cross-sectional research surveyed 842 undergraduates across 101 Turkish universities. The findings indicate that students preferred studying using apps, by making it obvious how college learners use mobile apps to their advantage. The primary reasons students engaged in the apps were learning, social communication and entertainment, such as gaming. Although I regard their research as data informative, I cannot generalise their findings. Their sample choice lacks a population frame. To conclude, figures regarding the amount of hours that university students spend on their mobile apps on a daily basis is an appreciated factual outcome. However, I would be interested in knowing 'how' the time is spent. Qualitative analysis of the findings might be an added value for a big-picture understanding.

Digital Media, Learning & Gamification

Employing gamification tactics has been evident, with variations, in language learning in classroom settings for the past decade. Deterding, 2012; Deterding et al., 2011, referred to gamification as the selective inclusion of some game elements into an interface for learning. The intension is to have an interactive learning medium as an interactive end-product rather than an entertaining game. Learning a new language through digital game-like learning materials with interactive exercises may

enhance participation and engage learners in language study as a recreational activity.

Previous research in gamification and performance, examined how virtual bonus points, leaderboards, and levels, are three of the most widely utilised game aspects. These aspects affect need for inner satisfaction, which may lead to a rise in intrinsic motivation and eventually improvement in performance (Hamari et al., 2014; Seaborn & Fels, 2015).

Currently, some mobile learning apps also employ game tactics for teaching languages. However, the following are reviewed studies that investigated the gamification element of language learning. The studies focused on the game element and tackled the analysis of the user experience.

In this section, I will review mobile media, as one of the key components in Figure 1, in the context of gamification. I will review some studies to examine the link between the game-like design of platforms and learning. Also, I would like to assess the strengths and weaknesses of gaming in mobile language learning.

Sultana, Fessist and Christ (2012) demonstrate a cooperative game prototype for learning a language known as the Language Learning Game (LLG). The tool is designed to aid learners studying a new language using their smart mobile phones. In order to take part in the game study, participants must have some level of basic language knowledge. Mobile operating must run on Java software and have access to the Internet. In the findings, researchers saw an instant increase in English language training. The game play brings three to five players together to cooperatively develop a narrative storyline in English. The authors present the following as essential gamification elements:

- Objective: Enhance learners' self-esteem in language learning.
- Mechanics: Composing sentences that combine into a narrative.

- Collaboration: Participants self-correct each other's sentences by voting and composing a sentence that carries on the narrative.
- Response: After participants' correction, the observer finally corrects grammar and spelling errors, pointing out corrections that the students missed.

Every player composes a sentence and shares it with the group members. The group then votes on the original version and adjusts the sentence variations for a correct version. Participants write sentences following on from each other, and the cycle is completed when all players have written a sentence. The game runs for three to four rounds. The design requirement must involve all players in the sentence writing of the storyline (Sultana et al., 2012). Eventually, an observer, a person with high proficiency in the particular language, evaluates the created story and proposes corrections. In the end, the participants get the full narrative version with the observer's corrections.

The LLG is anonymous to avoid any sense of pressure or anxiety that the participants may feel about making mistakes or being judged. To avoid learners with higher language proficiency gaining rewards and those with limited language learning skills getting nothing, the researchers ensured the participants that a favourable outcome is the product of cooperation, where they develop mutual assistance. The researchers observed that students' critical skills were enhanced, and their memory retention and interest in studying the subject also increased. As a result, their self-esteem improved. Furthermore, the researchers also gave the best player/writer and their group an award, but without naming the winner to avoid hostility. The progress level was also anonymous amongst the players.

Some teachers showed interest in the LLG and were willing to implement it in their courses, affirming that it is a complementary endeavour to broaden the curriculum (Sultana at al., 2012). On the other hand, there is no prescribed sign of the level of learning progress. The LLG lacks evidence. There is a possibility that the game may heighten the difficulty of learning the language structure. Also, as learners/players gain more in-depth knowledge, peer pressure may become a challenge to the functionality of the group. The study neglects to explain the choice of the game theme, as the observer might propose a situation or theme that may not engage players in a developing narrative and story construction. For instance, the contention can inspire learners' participation while matching collaboration. However, players' anonymity may support the objective of the game, and provide a stress-free attitude to making mistakes. It may initiate players into the trial-and-error technique of learning, whereas in the other social elements of the game, group work may develop the social interaction, which is crucial for language learning.

Deterding et al. (2011) drew limits and boundaries for learning gamification. In their study, they introduced game design elements in non-game settings to encourage learners to perform what they perceived as boring tasks, through activities immersed in game-like enjoyable settings. Word games were positively affected, and vocabulary grew as a component of the language learning game study. Meihami et al. (2013) supported the argument. In their experimental qualitative study on Iranian male learners, they aimed at examining the assertion of the CALL and particularly simulation games. They suggested that it may enhance English language pronunciation and vocabulary acquisition. They based their findings on a population of 72 advanced students aged between 20 and 22 who learned English as their second language. The study population was divided into two clusters. The participants of one study group learned vocabulary and pronunciation through

simulator games, while the other group used similar material but in a conventional setting through a teacher.

Later, the two groups sat for an examination after one and a half months of studying. The outcomes showed that those in the experiment group, who employed simulation games, received higher scores and surpassed the control group by a significant amount in vocabulary and pronunciation. I regard this study as being well designed in terms of the sample, population and methodological tool. However, I would urge further inclusion of female students within the experiment. Also, I would give consideration to the psychological factor of the moderators being present at the experiment, and the location of the experiment inside the institution where the students study. The impact of these factors may hinder the objectivity of the findings.

Game-like learning and productivity

The same results were echoed in another research conducted in different settings by Aghlara and Tamjid (2011). They looked at an Iranian English-classroom environment. They based their experiment on control group analysis. By dividing the one classroom into two clusters, they marked one group as the control cluster. Twenty girls between the ages of six and seven were under observation for making comparisons after 45 days of studying. The experimental cluster that employed the digital game SHAIEx for English language vocabulary comprehension proved more successful. The research findings also suggested that using computer games for studying language minimises the stress entailed in the learning process and provides a more enjoyable learning environment. With the same style of investigating students' performance, another research finding in New Zealand, on first-year university students, noted that digital computer games have further positive impacts on learners such as attainability (Grimley et al., 2011). Learners who used computer games were more active and alert, felt more involved and experienced a higher sense

of challenge than learners participating in conventional old-style classroom settings, according to their study findings. I consider this study more inclusive in terms of gender, in contrast to the earlier one, and innovative in terms of the methodological tool as they employed an experience sampling method to record real-time emotions and experience. However, the psychological element of being observed whilst performing is still evident.

To round up the review on the utilisation of gamification in learning, according to these studies, gamification in learning may produce an element of productivity. The findings, regardless of the tools and population, revealed an overall positive impact. In the review, researchers claim that introducing the game-like setting to learn mainly enhanced their subjects' pronunciation and retention. The major concern I raised regarding these attempts was the method of data collection, as it disparages the autonomy of the learners. In other words, they imposed the new media understudy on the subjects. The analysis and the findings undermined the learners' independence to choose. I would raise a question over the driving motives that led the subjects to conform to the introduced gamified element. Another key concern I would like to investigate is the post-experiment engagement. Are the subjects still committed to the learning apps or did they drop them as soon as the moderators terminated the experiment and the researchers concluded the findings?

Finally, Mekler et al., 2017, in their research to assess the intrinsic factors within gamification, have highlighted the need to study the long-term consequences of gamification to better assess whether and under what conditions game design structure affects user engagement in the long run.

Language learning and virtual engagement

Referring again to Figure 1 and the key components of the study, narrowing the mobile media to specifically mobile language learning apps may add depth to the review.

Today's apps have come a long way from the 1994 IBM Simon hand-held communicator's basic calendar, e-mail and alarm clock. Nowadays, apps cover different subjects, including news, maps, shopping, games and many others. The adaptability and extended potential of the mobile apps to solve complex problems may explain their massive popularity. It is evident in the annual app download data. In 2017, Cheney and Thomson (2017) estimated that we downloaded 178 billion apps worldwide based on their study and forecast that the number would rise to 258 billion by the year 2022.

There are now many mobile language learning applications that offer learners the opportunity to learn a new language autonomously and using a customised approach. Although there is no consistent ranking for the top free language learning apps, as reviews and studies change frequently, few apps remain relatively dominating the market. To list the top free language learning apps that are available on both Android and Apple stores, PCmag UK identified these apps: Busuu, Duolingo, Beelingup, Memrise and HelloTalk (Duffy, 2018). Other search results may identify other apps, however the Busuu and Duolingo apps remained relatively constant.

Duolingo and Busuu are gamified language learning social network sites (LLSNSs) and mobile free apps; they promise users easy and fun learning in an engaging format. Duolingo has a tree structure and learners advance in the game by unlocking a sequence of interactive lessons. The goal is to practise continuously without losing the streak progress indicator. Busuu's structure, on the other hand, has five proficiency levels, ranging from a beginner level to an upper intermediate level, with

every level having two groups of lessons. Most activities in each lesson are accessible with no charge, but some require a sort of payment to getthem unlocked (Gunter et al., 2016). The Duolingo and Busuu apps were mentioned by Golonka et al. (2014) in their study as the most noticeable LLSNS web-based and mobile technology.

The key players in the language digital market

Assessment of the dominant language apps

Duolingo

This app's co-founders were von Ahn and Hacker, their initial aim was inspired by their doctoral study for developing apps (Garcia Botero et al., 2017). They initially developed the app in a mission to offer 100% free language learning. Currently, the app has the highest popularity with over 150 million users worldwide. In the US, more individuals are learning a new language or exercising an existing one using the Duolingo app than all those who are enrolled in the public school system (von Ahn interview, Orin, 2008). Randall and Jašková (2014) say that Duolingo was based on a similar design rationale to CAPTCHA, another co-creation by von Ahn and updated to reCAPTCHA (Orin, 2008; Siegler, 2011). reCAPTCHA and CAPTCHA are free tools used to differentiate human web log-in activities from online bugs or web hacking, for the sake of safeguarding against and preventing potential malware.

According to Siegler (2011), von Ahn first attempted to visualise an easier way to get the diverse Internet users to interpret English language websites; however, there are never enough bilingual individuals that could efficiently translate the text, while translating websites are not always accurate.

Duolingo as a project turned out to be a 'happy mistake' for Hacker, as his PhD project aim mistakenly turned into a different outcome (Shandrow, 2015). Randall and Jašková (2014) outlined Duolingo as a descriptive linguistics translation arrangement with a tree lock-step advancement structure that uses a gaming architecture. Progression in learning depends on the mastery of basic levels and moving onwards through the branching tree levels. Duolingo's set-up design is based on the algorithmic rule. An algorithmic framework system is a smart system that plays a fundamental role in directing users' choices towards acceptable customised probabilities based on the users' preferences. Typically, the most often used type of algorithm is collaborative filtering, whereas the most conventional algorithmic framework prediction model is a memory-based filtering (Zhong et al., 2019). Duolingo enforces addictive conduct inspired by digital puzzle games, like Candy Crush, yet in an educational design, the type of gamification that assigns points for achieving certain tasks (Gannes, 2014).

However, Duolingo as a game is dissimilar to those immersive role-playing games, where the player engages in a digital domain. The difference is that Duolingo breaks up lessons into bite-size activities that can be done anywhere, such as when the learner/player is waiting for the bus. It makes learning feel like a game and less like a chore (Cha, 2014).

The transition from a typical descriptive linguistics translation method into the single most prevalent language learning media product in 2016–2017 may attract more potential language learners. Given the new mobile media affordances, and according to Duolingo's advertisement literature, the app caters for the highest number of learners globally, and contributes to public school learners in the developing nations (Duolingo, 2021).

Ajisoko's (2020) research holds that over 75% of learners strongly affirm that Duolingo helps them understand and practise vocabulary in their learning. Another study investigating students from two different Spanish learning institutions found that learners noted that using Duolingo was easy, enjoyable and helpful in studying (Munday, 2016). Because of the app's suitability, the students preferred it to the ordinary books and written homework. Other elements that shaped learners' attitudes were mobile availability, diversity of tasks and the game-like attributes.

Duolingo can automatically be set to the language of origin and instructs the lessons in that language of preference. The app provides brightly coloured start menu icons as basics 1, basics 2 and phrases. The app's working principle is a locked step advancement navigating through essential course prerequisites as one finds a route to advanced learning levels. Such a design clarifies that interpretations demanding user confirmation of ill-defined real-world text in advanced texts are not accessible until rookie levels give satisfactory authorisation (Duolingo, 2019). The tasks repeat practice phrases and vocabulary that encompass word matching, dictation, translation from two languages and gap filling. They also feature grammatical tips (Duolingo, 2019).

The Duolingo company developed various courses and offers 32 languages for English learners. The app has 21.8 million active members, amounting to 7.2% of all users (Duolingo, 2019). However, according to the year 2020 statistics, the total number is 500 million users, and about 40 million active users on a monthly basis (The 2020 Duolingo Language Report, 2020). The platform has courses developed in various languages. As of the end of 2019, Duolingo provided 39 learning languages. All the languages facilitate English learning as an extraneous language and other languages depending on learning preference. However, many courses in other languages are still under development. The course description displays items under development in many areas in which it is available. Duolingo provides 98

language learning courses offered in 39 distinct languages (The 2020 Duolingo Language Report, 2020). Duolingo app users' numbers rocketed at the beginning of the global pandemic in March 2020. During the first lockdown pandemic wave, 30 million new users turned to language learning (The 2020 Duolingo Language Report, 2020).

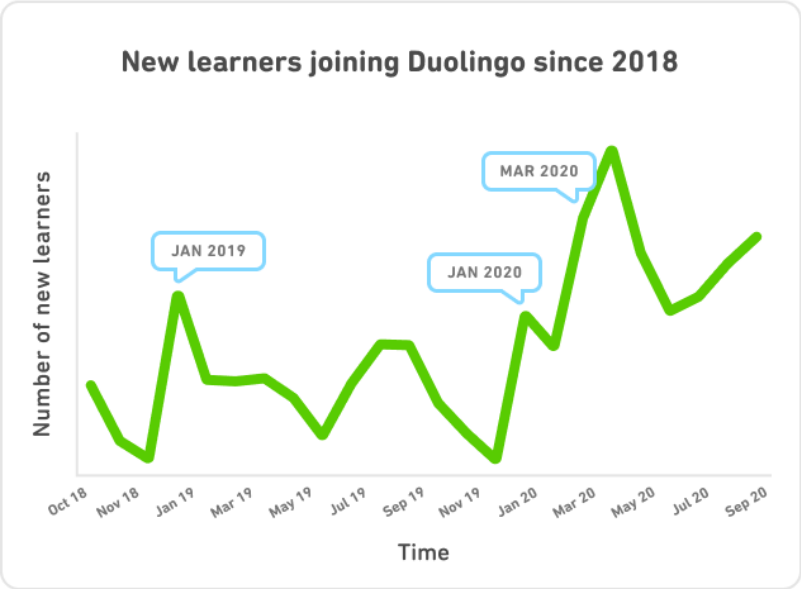


FIGURE 2: THE 2020 DUOLINGO LANGUAGE REPORT

This illustrates the number of language learners who enrolled themselves in the app as part of their New Year's resolutions. This noteworthy increase in language learning was much greater than any other New Year spikes. The worldwide Covid-19 spike was more than twice as high as the spike of the 2020 New Year. The pandemic learners are over 1.5 times more than the significance of the peak of the 2019 New Year's resolution learners (The 2020 Duolingo Language Report, 2020).

The Duolingo app defines its vision based on three vital elements. The vision summarises the company's standpoint. First, it offers personalised learning. The company's goal is to offer access to learning for everyone, regardless of their learning potentialities, through the use of modern technology. Duolingo assumes that, based on its users' learning error correction style feedback data analysis, it can formulate the best-suited approach by providing adaptive learning. The second element is making studying fun. The app interface integrates puzzles that may engage learners through breaking the monotony of conventional textbook learning. Finally, it has a universal accessibility. Duolingo claims to provide a service free of charge, with no hidden fees. It is available for all learners, no matter their income level or their geographic location. The subscription plus service is correspondingly affordable (Duolingo, 2019).

Duolingo features three kinds of account, namely: Regular, For Schools and Duolingo Plus. The 'For Schools' account permits tutors to trace students' progress. The development was particularly for educational institutions. Duolingo Plus has extra features for users, like offline courses, block advertisements, monthly streak maintenance and a progress trace quiz. It is the only payable version at $6.99 a month (Duolingo, 2021) The app offers a deal of a free trial for a week for the premium account. However, the Regular account will always be free (Duolingo, 2021). Duolingo has a unique 'Incubator' section where users can contribute and help in developing language courses. For the Duolingo app, the company provides its flashcards and dictionary, reading exercises and podcasts. Duolingo has an active presence on social media, especially by utilising Twitter. Also, it has a continuous feed on other digital platforms, like Facebook and YouTube. Duolingo has its own

forum and blog for discourses and language discussions, and access to its media is open to all members to interact.

Busuu

This app first launched in 2008, developed by Bernhard Niesner and Adrian Hilti. Busuu is the largest social linguist website for learning languages in the world (Vesselinov & Grego, 2016a). The name originates from a native language originated in Cameroon, which, today, is almost extinct. Its main development asset is to integrate the communicative factors of social communication into personalised digital learning. Busuu enforces this through chat rooms and video rooms to have language tasks corrected by other native speakers. The exchange of language is developed by the presumption that one can assist and correct a language learner better than another learner who commands this language as their native language. It has over 80 million downloads and study courses in 12 languages, making it the second-highest downloaded language studying app. As of January 2019, it had over 90 million registered members on its social network, and an average ranking of 4.3 out of 5, with about 260,000 assessments (Busuu: Learn Languages - Apps on Google Play, 2019).

Busuu courses encompass about 61 training sessions and about 340 units (Vesselinov & Grego, 2016a). Each lesson has descriptive linguistics and additional lexicon units, including conversation practices for advanced practice in the setting. Native speakers further reinforce the communicational aspect through exchange practice and feedback. Busuu, unlike Duolingo, is not free. Busuu users buy monthly or annual subscriptions. This may be one of the reasons it has fewer positive

reviews. Unlike Duolingo, it also provides certifiable classes for the proficiency degrees A1 to B2 as per the Common European Framework of Reference (CEFR). Because of an established partnership started in 2015 with one of the world's most pronounced pedagogical publishers, McGraw-Hill Education (*Get your official McGraw-Hill Education language certificate*, 2021) concludes why Busuu claims it has the potential to push learners to a higher B2 level.

Busuu classes have addressed crucial fields of language learning. The learner advances in each stage, slowly arriving at a more enhanced level bit by bit. Busuu claims to improve linguistic skills like listening, speaking, reading, writing, grammar, vocabulary and pronunciation. The last three skills are, however, ranked as the most essential and encompass more practice (Busuu, 2019). It has two types of accounts. The primary user account has no charges, and all the courses are accessible. The premium account has several subscription plans: quarter, half, annual or 20 months. Extra features within the premium account include interactive exercises, extra grammar units, full availability of 12 language courses, real human conversations, offline mode, a personalised study design and a certified language examination. The annual cost ranges from €70 to €90 based on the payment plan. The users may access and postpone the payment for a free first week (Busuu, 2021).

The Busuu app and website define its vision based on four vital elements. The first element statement highlights the high-quality learning. All course development is the product of various practised teams. The following declaration is a guarantee to study with a native speaker of the language. This attribute of the Busuu platforms permits users to communicate directly and to be sympathetic. Giving and receiving instant and non-automated responses to and from other human learners provides the real-life interaction asset. In the third proclamation, Busuu projects itself in the

MALL market as extremely efficient. Research undertaken in 2016 by New York City University in conjunction with the University of South Carolina revealed that 22 hours of using the Busuu system enables users/learners to accomplish results that require a full semester of language training (*How efficient is Busuu?*, 2021). All of the study participants showed advancement in language following 16 hours of learning with Busuu. The last company affirmation is accessibility, to learn anywhere and anytime. Courses are reachable online and offline, allowing users/learners to study at any time, and at any geographic location (Busuu, 2021).

According to Busuu's efficiency research carried out by John Grego and Roumen Vesselinov, Busuu users/learners require on average 22.5 hours of learning, over a two-months time frame, to cover the necessities of a single Spanish language college semester. It is approximately 1.5 times more efficient than Duolingo, which may take up to 34 hours to cover the same quality of learning. The primary tool for assessing the Spanish knowledge level in the research was the Web-Based Computer Adaptive Placement Exam (WebCAPE test), and the university fundamental arrangement test (Vesselinov & Grego, 2016a).

Babbel

Babbel originated in the app market in the year 2007. At that time, Babbel was considered to be the pioneer in the language learning app field. Babbel is the highest-earning language learning app globally (Google Play Store, 2019). Babbel is the third most used language learning app with over 10 million downloads and 14 different language courses, from seven learning languages. It has a rating of 4.5 out of 5 with around 582,005 feedbacks and was granted by both Apple store and Google play the best app in 2014. It was regarded as the favourite app of the year in

2015 in nine countries (Google Play Store, 2021). In 2016, the American business journal *Fast Company* even distinguished Babbel as the most pioneering company of the year in the education area (Lufkin, 2014).

In efficiency research, an app dedicated to Babbel was developed by John Grego and Roumen Vesselinov. They are the same researchers who undertook the Duolingo efficiency research and that of Busuu too. Based on that, a debate was developed on whether Babbel app users can manage to cover the outcome requirements of one semester of Spanish college training, in just 21 hours of learning using Babbel within only two months (Vesselinov & Grego, 2016b). Based on this published data, it ranked Babbel as more effective. Whereas, Busuu, which stands at 22.5 hours, with approximately 1.5 times was rated as more efficient than Duolingo at 34 hours. The research results rely on the notion that participants were at the beginner level of a foreign language, Spanish in that case, and required around 15 hours of learning within two months with Babbel to achieve the equivalent outcome of a single college semester (Vesselinov & Grego, 2016b). In a hierarchal division, they ranked Babbel as the most efficient app for language learning beginners.

Babbel branded itself as a *power app* by combining communicative didactics, behaviourism, cognitivism and constructivism. Babbel claims to be 'the shortest path to real-life conversation' (Babbel, 2021). Since the app incorporates real human voices and dialogues of native speakers, the app sets itself apart from the competition by creating real and not robotic interaction. In the app description, they made a promise to users that it will empower them and they will eventually grow in confidence (Babbel, 2021). Similarly, the app structure employs little learning units that include travel, local cuisine, culture and nature to engage the users/learners on a daily base. Each unit comprises interactional lessons of around 5 to 10 minutes that address all four skills of language learning: reading, speaking, writing and listening.

The purpose is to develop a proper conversation by utilising the technology of voice recognition (Babbel, 2021).

The learning approach employed by Babbel is based on a didactic method influenced by the scientific approach of cognitive psychology. Every phase of the training has a connection with the succeeding one, allowing the user to build a robust knowledge model. All the tasks are dialogues and circumstances that users may experience in real life, excluding sophisticated and intellectual arguments. The practical component of Babbel is a discourse between the learner and the user interface, which is the representation of the native speaker.

Babbel claims it derived its standpoint from its unique service. However, Babbel is not an open-access learning service. Access to the content of the courses is conditional. Based on the selected language, the user must pay a subscription fee. The charges are surprisingly variable: a price to learn may change based on the aim of the learning – for example, learning for a travel trip may differ from learning for a school requirement. Duration is another variable. The charge for the service may vary based on the number of hours the user needs per day. As regards the subscription, payment is per month, quarterly or an annual subscription. However, Babble suggests that its value for money is in the offering of a personalised platform for individuals.

From conventional to virtual, a communication life cycle

Communication in this research relates to media communication and learning, simultaneously, in terms of teaching and technology. Researchers in media

communications have proposed a variation of definitions (Jackson, 2014), the most commonly used definition of communication views it as a process. According to Carey (1989), "communication is a symbolic process whereby reality is produced, maintained, repaired and transformed" (p. 23), whereas Schmidt et al. (2007) described it as the process by which individuals try to exchange ideas, feelings, symbols and meanings to create commonality.

Learning is a multidimensional operation; it happens when individuals try to explain what they view as unknown (Harrell-Levy et al., 2010). Education is communication too; however, we defined it as a systematic course in principles usually carried out by institutions. The principles inform the structure of education and help to determine its practical activity. Policymakers, researchers, practitioners and the wider society (Brown, 2016) accept it as the basis of a pedagogical framework of educational principles. Leach and Moon emphasised the notion of social approval for educational practice, seeing pedagogy as a "view of mind, of learning and learners, of the knowledge that is valued and above all by educational outcomes that are desired" (1999, p. 268). Education as a system has various forms of pedagogy related to the culture in which it takes place (Brown, 2016). Over time, a great deal of thought merged into what is commonly known as the 'communicative approach' of learning. This methodological notion recognises language learning as a communication process and not as a structure. Some scholars argued that the communicative approach of learning is well suited to language learning; it can adapt and also adopt innovative concepts into learning (Brick, 2012).

In regard to communication and learning, mediated education developed massively in the 1960s in broadcast television, both in informal learning and formal education (Jarvin, 2015). In the USA, *Sesame Street* was an early creation of an edutainment

(education and entertainment) format. Edutainment became a trend in media. Since then, there has been much research on televisual edutainment and learning effectiveness through media outlets designed for children and younger adolescents (Fisch, 2014).

As Zungri points out, "it was only after introducing integrated circuit boards and microprocessors that things took a more radical direction – with smaller, faster, cheaper machines ultimately invading both home and office environments during the 1970s and the 1980s, while also giving birth to the techno-pop phenomenon of video games. The 1990s brought two major advancements: The World Wide Web and mobile devices" (2015, p. 231). Such advances in technology changed communication and learning methods, education systems and entertainment. Interactivity aided gamification of education. Furthermore, Palloff and Pratt (1999) added that the whenever and wherever aspects of online learning give learners the power to plan their learning goals at the most fitting time and place for them.

In recent years, a growing number of studies in this interdisciplinary domain of communication and learning have suggested that the combination of new media such as digital games and mobile apps is becoming popular for cross-platform learning. Henry Jenkins, in *Convergence Culture*, is spot on when he suggests that convergence is not purely about the technology but also "represents a cultural shift as consumers are encouraged to seek new information and make connections among dispersed media content" (Sheldon, 2007, as cited in Jenkins, 2006, p. 288). According to Knight and Weedon, "it was clear that technological convergence through digital media would lead to high-risk alliances between telephony, TV, video and computing companies and that it also facilitated interaction between audiences and newsmakers" (2009, p. 131). There are some signs that learning strategies will move from one medium to another, and that transferability across multiple platforms has potential in learning apps (Fisch, 2013).

New media: the merging of social platforms:

'New media' is a term that is broadly used to describe many technological systems related to collaboration and community (Joosten, 2012). However, the term 'new media' is occasionally used as a generic term that may refer to social media, smart tablets and mobile apps. As its use gained acceptance from the 1990s it came to include a broad range of Internet and communication technologies and for my purposes has become too vague, so I use the term 'mobile media' (Kaplan & Haenlein, 2010). The usage of mobile phones in learning has many advantages, including portability, availability and connectivity, adaptability and individualisation, usefulness and ease of use. Mehdipour and Zerehkafi (2013) defined the several characteristics of mobile technology, including:

> Portability: The technology is available whenever the user needs to learn. Individuality: The technology can be personalised to suit the individual learners' abilities, knowledge and learning style, and supports personal learning rather than general office work.
>
> Availability: The learner can use the technology anywhere to enable communication with teachers, experts and peers.
>
> Adaptability: The technology can be adapted to the context for learning and the learner's evolving skills and knowledge.
>
> Usefulness: The technology is suited to everyday needs for communication, reference, work and learning.
>
> Usability: People with no previous experience easily comprehend and navigate the technology (as cited in Klímová, 2018, p. 1092).

Social media allows users to share observations, comments and achievements and progress with each other and converse. There are many platforms and social media is often described by its platform, such as social networking sites (SNSs) or blogs, or

its function, for example, virtual game worlds, and virtual social worlds such as Second Life (Barnes & Lescault, 2011). Most frequently used in learning or achievement apps, SNSs are online platforms that allow users to make personal profiles, create content and share messages by communicating with other online users (Boyd & Ellison, 2007).

A step into immersive digital learning

New trends are coming to language learning duo to the dynamic change in the digital world (Danesi, 2017). Mengorio and Dumlao observed: "The fast-pace lifestyle of the 21st century requires individuals to use diverse technological devices, especially mobile ones, in their daily lives. Educational fields attempt to integrate and use the rapidly developed technology for enhancing the learning process leading to the emergence of the notion of mobile learning" (2019, p. 50). One basic practice, and one that is becoming the most widespread, is taking a photo or a screenshot instead of writing down notes. Screenshot notes are seen as a replacement for handwriting practices since learners shifted from noting in their diaries to taking screenshots using their electronic gadgets. Using mobile phone technologies in learning is going further than note taking, or those practices discussed earlier in a game-like and social media format, to teach and practise skills like a language skill. There are now multiple mobile apps offering this service.

LLSNSs offer a variety of language exercises in a structured learning material format influenced by the early stages of VR. Learning on a digital platform combined with a social network offers features like personal profiles, adding friends and engaging with online communities. Based on instructors' and learners' feedback on English lessons on LLSNSs, Liu et al. (2015) concluded that learners welcomed the integration of social media features into language learning. Some studies have

revealed that user-friendliness and ease of using the platform are more important for language learning (Mengorio & Dumlao, 2019). But while users prefer social media features in LLSNSs, the ease of navigation across the platforms is of higher importance. Lai (2015) conducted a study to test the time and enjoyability of a platform, the study concluding that the platforms that entail less time and provide more support were among the platforms most preferred by learners. 'Recreational' is another key term used in recent research where it is observed that recreational language learning as a learning process is not driven by academic or professional achievement, but by fun and leisure activity (Kubota, 2011). However, in a later study by Nushi and Jenabzadeh exploring Busuu's possibilities, they concluded that "there is no doubt that Busuu provides well-crafted learning tools … it gets boring after a while and learners may lose interest in continuing using the application" (2017, p. 37).

Digital learner and media engagement

As we always correlate effective learning with motivation (Rashid & Rana, 2019), in this section I will review the last key component of the elements of the research, as per Figure 1, elements of the study.

According to Yates, "motivation is the internal power that drives individuals to act in order to satisfy their desire" (2004, p. 159). Weinstein, Husman and Dierking (2000) defined motivational learning strategies as unique blends of activities that can be used during learning. With engagement over time, these activates will facilitate learning and will transform knowledge into skills. In fact, when learners show a level of enthusiasm in participation and engagement with certain academic material, it is seen as an essential factor in their learning performance (Wolters, 1999).

Following Knowles, I define adult learners by distinguishing them from pre-adult or institutional learners. Knowles (1980) identified the following adult learners:

Adults are autonomous and self-directed; they need to be free to direct themselves. Adults have accumulated a foundation of life experiences and knowledge that may include work-related activities, family responsibilities and previous education.

> Adults are relevance oriented; they must see a reason for learning something.
>
> Adults are more problem centred than subject centred in their learning.
>
> Adults are motivated to learn by internal factors rather than external ones (Knowles, cited in Falasca, 2011, pp. 584–585).

In this review paper, I can mainly sum up the characteristics of the digital media learners as self-directed and autonomous, and acknowledge their need for motivation and self-evaluation.

Discussion

The review of literature indicates that adult learners tend to show lower levels of engagement in pedagogical activities, as they also cautiously select where to put effort into such activities, and they have their own personal learning goals. Based on these classifications, I argue that independent learners' engagement is overly affected by the perceived importance of the motivational aspect (Ceccato et al., 2019). Kubota (2011) suggests that the learning of a language and the personal and social world of the learner are co-dependent. Cole and Vanderplank (2016) have observed that when learners are given a reliable immersing learning material in a naturalistic setting, out-of-class learners progress better than classroom-based learners.

What remains unknown in regard to language learning apps is the relation between the independent learner's virtual practice of learning and their real social world, how these practices are affected by the learner's level of autonomy over time and also how technological shifts may affect this relation. Other research has mentioned that LLSNSs have social media features but that these are not necessarily used for socialisation and engagement with content, and learners may view them as surplus features (Lamy & Zourou, 2013).

Learning independently in the digital age compels learners to have high levels of digital literacy to know how to find and utilise online learning platforms. Umino (1999, 2005) outlined the characteristics of self-instructional learners, observing that they are not passive consumers of material. She clarified that setting personal aims and goals, being in charge and being proactive are the fundamental traits required for the self-instructional learner to persist in learning. Confirming Lai's (2015) findings, the study she conducted showed that learners preferred platforms that entailed less time and provided more support. Yet even participants of language

learning social network sites (LLSNSs) attempt to generate their own learning settings, and they do so in isolation.

Creating personal space and allocating time are vital assets for independent learners to enable learning to develop as a routine. Language learners are rapidly adopting LLSNSs and are replacing many classroom-based materials as LLSNSs provide engaging material and flexibility for self-instructional learning (Lamy & Zourou, 2013).

Non-formal platforms, such as mobile apps, are promising in offering a more stable learning environment that may facilitate the continuity of learning. A limited number of studies only investigated 'out-of-class' language learning experiences, and those studies were mainly focused on the challenges that learners encounter during learning.

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