

Implementing an Ecological Teaching through Mobile-Assisted Language Learning in EFL Education

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Abstract—Despite the notion of eco-linguistics; ecology and language, has been extensively discussed until currently, its complexity invites studies to make further specific contribution to strengthening the underpinning theories. This paper aims to sustain the emergence of an ecological perspective in the Applied Linguistics by presenting a research finding which investigated the students' experience when joining an English course applying the Action-based (AB) and MALL. It begins with an overview of contextual background with an emphasis on the sophistication of industrial technology elsewhere including in particular EFL settings which influence demand on the capacity to communicate in the multi-language settings. It then clarifies a general understanding of the ecology of language and mobile-assisted language learning which is prone to that with sociocultural influence. The study reported in this paper used a survey method to 324 participants enrolling in 4 departments at a vocational college. Based on the findings, the application of Action-based (AB) and MALL had given some changes in the students' behavior which involve the nurture of ecological EFL learning habit through mobile technology, an increase of learning motivation, the improvement of English skills, the enhancement of content-knowledge, and the advancement of technological skill.

Keywords—*ecological perspective; EFL education; mobile-assisted language learning; technology-enhanced contexts*

I. INTRODUCTION

Applied Linguistics is a discipline which has undergone rapid development until currently. Its nature which substantially relates to other disciplines has made it dynamic and encouraged interdisciplinary and transdisciplinary studies such as those which result in Ecological Linguistics. Like in other disciplines, the technology could enhance applied linguistics and ecological linguistics in practices. Even though its tenet provides prospective and challenging outcomes which offer relevance to the social life of the human being, there has been little study devoted to explore further to strengthen its framework. Therefore, the paper presents prospects and possibilities of applying an ecological approach through the use of mobile-assisted language learning (MALL) for EFL education in higher education.

A. Contextual Background

The development of EFL in the higher education contexts needs to go hand-in-hand with the development of global workplaces which become the goal of most EFL students. The most phenomenal workplace development is the industry 4.0. The term Industry 4.0 has commonly been used to represent a smart and sustainable industry which is flexible, efficient, green, and high quality [1]. It is the culprit of developing industry which transforms itself from traditional notion of industry to more technology-enhanced industry, and to smarter and more dynamic industry in which technology is used more sophisticatedly to sustain itself and to guarantee human well-being. This revolution of industry has placed the higher education worldwide on a strategic position to examine this development, to create and to conduct the educational programs that will create human resources who will be able to synergize with the sophistication of industrial technologies, to use it for worldwide development and to create smart innovations for future sustainability.

Before the notion of Industry 4.0 was introduced in Germany, countries in ASEAN had agreed to use English as an official language to communicate and to connect to each other [2]. In the industry 4.0 era, moreover, the demand for English ability is getting greater and greater. English that has previously been very much useful for most exchanges of information and knowledge, today it is needed in the depth of the dynamic workplace/professional communication. In this situation, the role of communication ability in English language, is pretty much crucial not only in the context of ESL (English as a Second language) but also those in countries where English is used as an EFL (English as a Foreign Language). Therefore, the field of Applied Linguistics is challenged to reframe and recontextualize its theoretical and disciplinary boundaries in order to be able to go hand-in-hand with this dynamic world and to contribute more significantly to the accessibility of the EFL speakers to the global circumstances.

This is basically a challenge for the field of Applied Linguistics and TESOL elsewhere, including those in EFL settings. In Indonesia, over the late decades, the English communication proficiency of professionals has been

considered unsatisfactory [3]. Tracing back to the learning investment they had experienced before entering for the actual workplaces, at least Indonesian spent more than 12 years to learn English (since elementary until senior high school) before going to the higher education. With this length, the majority of students who enrolled an educational program in higher education still have difficulty to function properly in common English workplace communication or in other activities related to the English language literacy [4]. It means that the teaching and learning processes they experienced had been unsuccessfully nurtured the English communication and literacy capacity.

Kirkpatrick who extensively conducted researches in Asian countries either with EFL or ESL contexts views that English is the language of the international community and therefore is important to maintain the notion of the World Englishes [2]. It represents the fair uses of English in the global situations without discrimination. In this tenet, American and British English is one of many other acceptable and recognized styles of English in the world. It is relevant to the development of industry 4.0 which directs industries to nurture a solid ecosystem of industry which is sustainable for the future life of human being. To this point, it is necessary to assert that English is a language which needs to be learned meaningfully. Meaningful learning involves the formation of identity [5,6] where English is genuinely learned and used by the students. They learn it as who they are with the complex but meaningful social and personal modalities. In this way, learning English formally focused in a small classroom is not sufficient to accommodate personal and social complexity. This leads to the emergence of the ecological notion in the EFL [7,8].

It is undeniable that within this global circumstance, the style of communication in social and professional situations changes and influences people's habits and life. The young generation is now identical with the generation of gadgets. Whatever they do and wherever they are, they cannot be separated from their smartphones. Despite its negative effects on social, psychological, and physical life, smartphones can have powerful impacts on personal and professional development of young generation particularly with regards to social literacy and capacity development. Current literature shows that mobile-learning has been deployed in the education world and especially explored in the English language education inside and outside the classroom [9]. The most current challenge is in anticipating the new massive development resulted from the industry 4.0. How could the use of mobile-learning contribute effectively to the sustainable development of personal and professional skills of university students? Seeing that mobile-learning can have powerful influences on the people's capacity, why not to empower them by using mobile-learning technology? Moreover, since industry 4.0 reflects the sophistication of technology beyond the technology itself, why not to nurture the smart habits of social, academic, and professional life? This paper substantially sustains the technology-enhanced EFL in light of the ecological theory in which all interactions and relations occurred in the class needs to be seen as a dynamic social reality which is supported by MALL in a sustainable manner.

B. The Ecological Theory

The ecological theory in Applied Linguistics was firstly introduced by Haugen to refer to the importance of a relationship between languages and their environments particularly socio-cultural environments [7]. Among the variations of ecological theory [8], this paper is more underpinned by a metaphorical perspective of eco-linguistics. It concerns that within the teaching and learning process of EFL, linguistics inputs are not enough for human capacity development. Current EFL education practices demonstrate that many of teaching and learning activities have been very much predominated with the notion of content-based and product-based which have driven students to orient themselves to superficial cognitive process and short memorization of the materials taught in the classroom. In an ecological approach, an EFL education can be designed to elaborate more on the social environment and its authenticity to create meaningful learning situations and to encourage social participation and engagement. It involves the relationship between interrelated aspects in physical, social and symbolic levels [5,7,10].

A research investigating the EFL learning in Indonesia found that one of the salient predicaments for Indonesian learners was to deal with intrinsic motivation [11]. It means that the curriculum and pedagogical practices performed by teachers had been unsuccessfully developed the students' intrinsic motivation. The students' learning process tended to be sporadically executed and failed to sustain a long-term commitment to learning English [11]. Many possible factors might be involved in it including the pedagogical approaches which merely work on short memorization and cognitive development, and the learning environments which were inferior to the authentic uses of English. This problem had been very common in any EFL situations where the external factors of learning might not be compatible with or powerful enough to give meaning to the students. Particularly, when English is merely regarded as the knowledge that is included in the mandatory subject of the curriculum, the students will find it hard to develop their intrinsic motivation and the ownership of using the language.

Going back to the ecological tenet, English is not merely regarded as a knowledge or a subject taught at schools but is an ability to socially act like a human being. It is a "praxis" embedded in the social life of students and influences their social capacity as a social person with a unique identity [12]. When they are learning and using it in their authentic situations, their identity is formed [5,7,10]. Identity is manifested in dispositions and voices. Thus, an ecological English teaching and learning needs to deal with dispositions and voices to inform pedagogical activity. This is a powerful tool to learn language through action or what is known as action-based [5].

The ecological EFL through action-based has rarely been discussed until currently due to its dynamic and complexity. Nevertheless, understanding such pedagogy and how can a change be executed, can be enhanced with what is offered in Bernstein' social stages [5,12]. These include individual enhancement that is firstly indicated by confidence in discursive events, social inclusion when students demonstrate

voluntary involvement in the particular community, and social participation which is characterized by changes as the result of social function and contribution within a community.

Following this theory, any pedagogical practices in light of the ecological perspective can be designed by deepening out each stage. When teaching English, improving students' confidence cannot be done by merely transferring the knowledge of English, but by giving them the experience of using (or *acting*) it in meaningful situations. During this process, a teacher has an important role as a facilitator who creates meaning and guides them through the discursive activities that will enhance their social capacity (individual enhancement). The effective individual enhancement will obviously improve their confidence. Sufficient confidence will encourage them to get involved in a particular community. In this, teacher's role is to stimulate, to facilitate, to set, or to create such community either inside or outside of the classroom, and might possibly be formal, non-formal, or informal ones [4]. A further role of a teacher is to encourage social inclusion and empower them to sustain their participation (social participation) in the community. This kind of pedagogy posits a challenge to English teacher in terms of how to succeed in designing the teaching and learning environment which will be pleasant, human, cultured, ethical, and contextual.

There are some other similar approaches such as task-based, project-based, exploratory, and experiential learning, however, action-based puts more emphasis on the activeness of students driven by agency development [5,10,13]. Within an action-based approach, students have the opportunity to participate in meaningful social situations which are natural, dynamic, unpredictable, and therefore, make the participation itself more complicated to the students [13]. In the higher education context, action-based is relevant particularly to be applied in vocational and professional education in which the students are trained with technical and professional skills which involve tools and technology, and elaborate social, academic and professional communities. Looking at the English teaching in light of ecological perspective means bringing it back to its strategic nature. As a language of global communication, English needs to be learned in meaningful ways. Students learn because they need to acquire it in order to be able to function properly in the global community with multi-language and multi-culture background. In this, the instructional activity needs to go beyond the limitation of cognitive-oriented and classroom-situated, covering the authenticity of the social life of the students [5,10]. Within this activity, the students are situated in natural situations which stimulate them to act and to behave as themselves with real individual responsibility and contribution to the real social situations. In this, the students' agency is developed through authentic experiences of behaving, sharing, respecting, appreciating, and becoming themselves as a social human being [6]. A relationship becomes important in this process. Albeit it is a non-linear process and complicated, it reshapes quality, values, and criticality which is central in capacity development.

There is a huge difference between learning process which relies on cognitive and other classroom-situated activity, and

that which is created through authentic situations to encourage authentic participation of the students [5]. When English is taught as merely a subject with limited exposure to the authenticity of the English language uses, the resultant learning tends to be short-termed. Otherwise, in authentic participatory learning, solid English communication capacity is gradually nurtured. Participation in authentic learning requires the students to have some extent of an agency or navigating skill, while at the same time, their agency is developed more strongly which nurtures their social capacity. Agency is understood as a source power which gives energy and direction to move beyond boundaries [5,10]. Within authentic teaching and learning, an agency is more explicit through the students' motivation, disposition, and voice. These represent identity which changes and develops through discursive social environment.

C. *Mobile-Assisted Language Learning*

M-learning can be defined as a learning process which is supported by mobile devices, abundant information technology, and interface user's intelligence [14]. Mobile devices can be in the forms of smartphones, mobile phones, computer tablet, and PDA (personal digital assistant) that can be used to learn. With regards to this, a research intended to investigate journal articles indexed by SSCI (Social Science Citation Index) from 2007 to 2016 found that from other types of mobile device, smartphones are the most used one [15].

Using smartphone for any purposes can provide flexibility, practicality, and unlimited accessibility to any sources and networks for the users. For English language education purposes, using a smartphone can be very rewarding and meaningful. What makes it meaningful is its power to provide authenticity for the students in which they learn to be themselves and act genuinely as a person which perform socially within the real situations [16].

The impact of mobile devices has extensively investigated in the literature of education in general and English language education. As carried out in reference in the UK which compared between face-to-face communication and communication through mobile devices in the extension of social programs, found that there was relevant and desired efficiency and effectiveness of mobile communication when deployed for some urgent situations and purposes [17]. In the literature of English language education and studies of media and technology, attention to the use and benefit of mobile learning has been given since the 1960s [18]. However, the nature of mobile learning that is dynamic and unstable makes it changed from time to time following the development of age [19]. With regards to this, many studies confirm its' dynamic and therefore requires the newest studies and researches in order to evaluate, to strengthen, and to reshape it in order to cater for the ongoing situations [15,18,20].

One of the influential studies is in reference which has much been cited by studies and researches in MALL [21]. It elaborates solid consensus on the use of MALL that contributes to the effectiveness of teaching and learning in light of collaborative and social tenet. This dynamic potency opens the opportunity to innovate MALL in order to cater for particular

students' socio-cultural contexts. To broaden the view, a research carried out by Duman et al revealed that mobile-learning can be effectively applied at schools accidentally (ad hoc) which intended to create and to nurture rich and conducive learning environments [18]. Firstly, it is interesting and challenging to do. Secondly, there are abundant sources of learning can be provided easily and effectively. Thirdly, the time of learning is definitely flexible and can be adjusted to meet the students' schedule. Finally, its implementation is dynamic that will change and develop following their unique contexts, characters, and identity.

A study which developed a mobile-learning system through wireless network which is intended to enhance the effectiveness of scaffolding in the teaching and learning outside the classroom, confirms that smartphone fulfilled these three criteria: mobility, portability, and individualization, which are all crucial parameters of teaching and learning in light of socio-cultural theory [22]. Studies like this encourage innovation and development of mobile application and features which will be powerful for learning English in ESL and EFL contexts. An extensive study found that MALL is powerful for varying English teaching and learning activity which is flexible and dynamic and giving the opportunity to teachers, researchers and application makers to develop the best smartphone applications for learning English [23].

II. METHOD

The research used a survey method that was done mainly by using a questionnaire in collecting the data (Appendix). The questionnaire was distributed to the students who enrolled in 4 departments at a vocational college: Informatics Management (IM), Seed Production Technology (SPT), Food Industrial Technology (FIT), and Agribusiness Management (AM). There were 324 participants voluntarily filled out the questionnaire; Informatics Management (79), Seed Production Technology (77), Food Industrial Technology (82), and Agribusiness Management (86).

The survey was intended to discover the participants' changes in attitude or behavior before and after joining the English courses. The English courses were carried out for six months and facilitated by the same lecturers who applied action-based mobile-assisted language learning (AB-MALL). This course elaborated and integrated inside and outside learning activities, individual and group projects, written and interactional tasks. The pedagogical approach concerned on "the learning process, the actions and activities of teachers and learners, the multi-layered nature of interaction and language use, in all their complexity and as a network of interdependencies among all the elements in the setting, not only at the social level, but also at the physical and symbolic level" [7].

III. FINDINGS AND DISCUSSION

Based on the findings, the application of Action-based (AB) and MALL had given some positive impacts which involve increase of motivation, change of learning habits, improvement of English skills, enhancement of content-knowledge, and advancement of technological skill.

In general, all responses are presented in the table below.

TABLE I. THE PARTICIPANTS' RESPONSES IN PERCENTAGE (%)

No	Statements	Agree	Not sure	Disagree
1	It was an empowering experience when I learned English through Action-based MALL.	88.96	7.36	3.68
2	Learning English was motivating in this way since it had connection with my study and social life.	91.67	5.25	3.09
3	It was exciting when I explored the unlimited sources relevant to my interest (related to the department core competency) and acted with it while learning English.	91.36	6.79	1.85
4	I can now enjoy learning English by using mobile technology anytime and anywhere through my daily life activities; e.g. accessing sources and building relations.	92.90	6.17	0.93
5	I perceived that my confidence in using English had significantly been developed in such a way which effected on the development of my English skills.	80.86	13.58	5.56
6	The learning was rewarding and I can now use mobile-technology better than before.	76.85	16.67	6.48

n=324

The greater percentages shown on the table 1 indicated that there were significant effects of applying Action-based MALL for about six months. Each point is addressed more specifically as follows.

TABLE II. STATEMENT 1

No	Statements	Agree	Not sure	Disagree
1	It was an empowering experience when I learned English through Action-based MALL.	88.96	7.36	3.68

A greater percentage of participants (88.96%) believed that "It was an empowering experience when I learned English through Action-based MALL". Since the action-based learning promoted a long-term investment rather than short memorization, the learning process fostered the students to realize gradually that learning is powerful to empower their personal life, and life is always social by which we develop ourselves and build up the meaningful future. In this lens, they learned that English, like any other (local/national) languages, is a part of global life which functions as a means of communication. When the students were given the opportunity to use English in meaningful ways, they could widen their social life through connection with others in the global community and therefore meaningful for personal and professional development, particularly to help them explore how to deal with global and English-mediated networks and unlimited sources.

TABLE III. STATEMENT 2

No	Statements	Agree	Not sure	Disagree
2	Learning English was motivating in this way since it had connection with my study and social life.	91.67	5.25	3.09

The second benefit was an increase in EFL learning motivation that was agreed by 91.67% of the participants. As mentioned previously, authenticity is an important characteristic of ecological EFL. It is necessary to recognize that English had long been perceived unpopular subject due to negative upheld assumptions (e.g. English is only a subject, the grammar makes it hard, etc.) since they were children. Students could have a long misleading investment since they had been learning English without sufficient influence of authentic environment. However, learning English by applying mobile-learning in light of ecological perspective was perceived innovative and challenging. Particularly, the students found that using mobile-learning gave them a new meaning in English learning by which they could connect English language communication to their life and whatever that is meaningful for them. Learning English in this way provided them with plenty of opportunities to connect with the wider or global community and to get the most updated information related to their interest.

TABLE IV. STATEMENT 3

No	Statements	Agree	Not sure	Disagree
3	It was exciting when I explored the unlimited sources relevant to my interest (related to the department core competency) and acted with it while learning English.	91.36	6.79	1.85

Another impact of the approach was that it generated the development of insights around the content-knowledge learned at each department. In this case, 91.36% of the participants agreed on it. What had attracted the participants when given unlimited authentic sources was that, they could independently select and determine what they truly needed and what were meaningful. In this case, they were inspired by the use of specific, relevant, and interesting materials/sources to discuss which enabled them to associate the use of English to their prior knowledge, and meaningfully use English while exploring new information or networks.

TABLE V. STATEMENT 4

No	Statements	Agree	Not sure	Disagree
4	I can now enjoy learning English by using mobile technology anytime and anywhere through my daily life activities; e.g. accessing sources and building relations.	92.90	6.17	0.93

The greatest change rated by the participants was in terms of the nurture of an ecological learning habit. The majority of the participants (92.9%) believed that the experience had

influenced their present learning habit, particularly, they keep “acting” in English more flexibly supported by mobile-technology until currently. It was due to its’ modalities which enabled the lecturers to inspire and encourage the students to learn English through life and to live with sustainable English action. An important part of a subject or course adopting this approach was that the students were gradually trained to organize their learning as a part of their social life. In this case, they were guided and facilitated to use mobile technology to support sustainable learning and life. Its nature was not to replace the interpersonal encounters occurring in the environments of classroom, campus, and social life but to enhance their discursive actions within the community. It was far more than traditional one-way educational interactions; it was a dynamic mentoring which individualized learning based on specific situations of the students.

TABLE VI. STATEMENT 5

No	Statements	Agree	Not sure	Disagree
5	I perceived that my confidence in using English had significantly been developed in such a way which effected on the development of my English skills.	80.86	13.58	5.56

Another positive effect, of course, was to deal more effectively with the development of the participants’ English skills. Many studies worldwide confirm that authenticity can result in more effective development of students’ English skills. Given and elaborated in integrated ways such as what was provided in the Action-based MALL, the participants’ English skills were nurtured more meaningfully and therefore could give stronger and more confident English proficiency.

TABLE VII. STATEMENT 6

No	Statements	Agree	Not sure	Disagree
6	The learning was rewarding and I can now use mobile-technology better than before.	76.85	16.67	6.48

The last usefulness identified was on technological skill particularly the skills of using mobile technology for learning purposes. In this case, learning to use technology for sustainable learning could be hard and intricate, and therefore the participants needed the effective encouragements and practical guides. After sometimes of adaptation with it, many of the participants were able to adapt themselves and to cope with most mobile-learning situations such as engaging in “digital” class forum, doing electronics assignments, taking tests, attaching different files, using the cloud, accessing authentic sources, and other communicative activities mainly through mobile-technology features.

IV. CONCLUSION

The present paper has presented the emergence of a socio-cultural theory by addressing possibility of applying the action-based teaching facilitated by mobile-assisted language learning

(MALL) [5]. There have been robust theoretical underpinnings on how to implement this in an ESL/EFL settings. Nevertheless, because the nature of EFL is dynamic and context-dependent, there has always been plenty of opportunity to investigate and study its practicality in specific educational settings. Thus, the idea presented in this paper is expected to provide a little overview of its emergence to be adopted in the present and future EFL. The study had revealed that an EFL teaching underpinned by ecological perspective facilitated by the features of mobile-assisted language learning had become a robust tool to develop the students' intrinsic motivation, to nurture the habits of ecological learning, to improve content-knowledge, to make students more confident in language use, and to strengthen technology skills. However, it is necessary to clarify that a survey research reported in this paper was aimed to seek for generality within a big population rather than to get a thick description of the students' experience after joining the Action-based MALL.

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