**The Effect of Technology-enhanced Learning Approach on EFL Learners’ Listening Skill**

**A Meta-Analysis**

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**Abstract**

Listening is one of the four macro skills in language learning and is regarded as the most difficult one by some educators. This meta-analysis aims at studying the effect of technology enhanced learning approach on English learners’ listening comprehension. Moreover, is also studied the difference of the effect of different treatment type and treatment length. Data shows that technology enhanced learning approach help learners improve more than traditional learning approach, CALL works better than MALL and long term treatment have greater effect than short term one.

**Key Words**: CALL, MALL, EFL, Listening comprehension, listening skill

**Introduction**

We all know that listening is one of the four macro skills in language learning and it is the first of the four skills. But what actually listening is? What is the definition? Generally speaking, regarding to the procedure of listening, we can say that listening is receiving language through the ears, identify the sounds of speech and process them into words and sentences and then understand the meaning of the speech. Just like Brownell (2002) said, listening is the process of receiving, constructing meaning from and responding to spoken and/or non-verbal messages. During this procedure, people use ears to capture individual sounds and we use brain to convert them into meaningful information. There are different ideas on the definition of listening. Byrnes (1984) took listening comprehension as a highly complex problem-solving activity that could be broken down into a set of distinct sub-skills. Some take listening as an interactional and active process during which the listener receives speech sounds and tries to attach meaning with the spoken words. The listener tries to understand the intended message of the speaker(s) to respond effectively to oral communication.

What’s more, listening and hearing are usually considered as different process. Hearing is considered as a natural passive, physical process, while listening is active physical and mental process which should be learned and defined as a skill. A listener could understand information spoken at a rate of 380 words per minute, an average person could only speaks at a rate of about 150 words per minute. And listening would require us to focus and it require our attention. Listening in a second or foreign language would require much more focus.

Among the four macro language skills, say, listening, speaking, reading and writing, listening is usually the first language skill that we acquire in our mother tongue. To be fluent in a language, we need to develop strong listening skills because it not only help to understand what the others are speaking, also how to express your mind, it helps us learn the pronunciation of words clearly, the use of intonation, stress and thus make our speech understandable. And listening could be regarded as the fundamental skill to language learning, because no learning could be processed without understanding the input at the right level. But listening skills is called the “Cinderella Skills” which is overlooked by its “elder sister” speaking in language learning (Nunan 1997). Some considered that people neglect the teaching of listening skills because listening comprehension section in language textbooks have only limited portion and that there are not enough materials available for the specific development of listening comprehension. Since it is characterized as a kind of passive activity and most teaching methods emphasized on the productive skills, listening does not receive enough attention in language teaching and learning (Richards, 2005). However, later researches have proved that listening is not a passive skill but an active process which would build meaning from sounds. According to Helgesen (2003), listening is an active, purposeful process of making sense of what we hear. And listening skill is important for everyone, it is used nearly twice as much as reading and writing so we should pay more attention to listening during language learning. Meta-analysis is a statistical methods that could interpret complex and intimidating at first glance in means of calculating the mean and variance of a set of numbers (Oswald, 2010). This meta analysis would focus on the learning approach to help improve EFL students’ listening skill.

**Background**

**Factors Affecting Listening Comprehension**

Nunan (1988) proposed that there are four factors influencing a learner’s success in listening comprehension, say the listener, the speaker, the content and visual support.

The first factor, the listener probably is the most important central one in the listening process. The listener’s pronunciation, grammar knowledge, his knowledge of how sounds merge or get reduced, his vocabulary size, his concentration on would all affect his understanding and thus affect the listening process. Moreover, if he is interested in the topic of the dialogues or the spoken text, then he would be more likely to learn about it and he would have deeper comprehension on the said content. His background knowledge on the topic would have influence on the comprehension on the listening topic.

The speaker also have influence on the listener’ success. His pronunciation, his accent and dialect, his grammar, his rate of delivery would affect the comprehension process. For example, if the speaker speaks too fast, the listener would be confused by his mumble like utterance. So, the speaker would better adjust his speaking speed according to the condition or language level of the listener. As for the accent and dialect aspect, a speaker with standard American English accent would be more understandable. When it comes to the teaching scenario, the teacher need choose the listening material that suits the students’ level.

Another influencing factor is the content of the spoken sentences. It is related with the above mentioned listener’s background knowledge and his interest on the topic. Content is easier to understand when it is familiar to the listener or the listener has background knowledge on it, and in that case, the meaning is easier to grasp.

The last factor that have influence is visual support which may be pictures, diagrams, facial expressions, body language and video. Listening would be much easier if you can see the speaker’s body language. A lot of things which would get lost in the tangle of speech would be more understandable on the screen once you catch a glimpse of an ironic smirk.

**Listening Process and listening Activities**

Generally, listening involves two types of cognitive processing, say top-down and bottom-up process (Nunan, 1988; Van Duzer 1977). For the top-down process, the listener actively reconstructs the meaning of the speaker through the context and the situation. The listener use his knowledge of the spoken topic and his relationship with the situation as well as previous events to understand the spoke content. For the bottom-up process, the listener would decode the context form the smallest meaningful units to complete text, from phonemes to words, then combine them to phrases, clause thus make them into sentences. And the sentences would build the meaning of the content so that he would finally grasp the meaning said by the speaker through his application of grammatical and syntactic rules. For foreigners, they always stay at the phonetic level in bottom-up processing. Probably because of that they are not familiar with foreign sounds or the speakers’ speed, they would fail to figure out the words that they hear (Norris, 1994). But many language teacher would still ignore the that, they encourage learners to use top-down model but neglect the bottom-up ones by teaching students not to listen for every word but pay attention to make prediction and guesses (Cauldwell, 1998). This strategy would work in some specific condition, however, top-down and bottom-up model should not be applied separately. They both work on the listening comprehension process or the listener may miss the spoken message. Cauldwell (1998) stated that in terms of the ability to perceive sounds and the ability to guess or predict the basis of contextual knowledge, native speakers have greater advantages over the non-native speakers. Thus language teachers should not require learners to simulate native listeners’ top-down activities while not give then any chance to acquire native-like abilities in bottom-up model.

In a language classroom, the listening learning include three kinds of activities, the pre-listening, while-listening and post-listening activities. Pre-listening activities aims to establish and active the purpose of listening activities. During this, the teacher would encourage the students think this about and discuss what they already know. It would offer the students background knowledge for the content and give them a glimpse on what to expect while listening. The while-listening task gives students real listening tasks. They can do various kinds of activities to develop their listening skills, such as response physically on what they hear, choosing right answer according to the listening content, transferring the message into another form, answering speakers’ questions, duplicating, condensing, expending the message, or doing conversation and more (Lund, 1990). Teachers need to apply activities that require students to perform both bottom-up and top-down model while design the class. Post-listening activities helps to evaluate the students’ learning. Students and teachers could discuss the answers to the listening task so that they would know their performance and integrate what they have learned.

**New technology and listening teaching**

The development of technologies have changed our life in various perspective. It would have influence on the education landscape undoubtablely. Under this condition, the teaching of language have changed form the traditional “chalk-and-talk” method to more collaborative student-centered learning methods.

Like Pierce (2013) stated, technology development, with increasing scope of available content demand us to reshape traditional learning and teaching models. Traditional approaches are intended to be reconstructed to innovative model that would make use of online activities and other free educational resources.

Some scholars have indicated that flipped classroom model would fit the requirements. Flipped classroom model, according to Bates & Galloway (2013) is inverted and it is also reverse and backwards (Halili & Zainuddin). In a traditional classroom, learning contents are taught by lectures and assignments or homework would be completed by students outside the classroom. However, for the flipped learning classroom, the input part is delegated off-site within the flipped classroom framework while classroom activities are taken as a follow up. Students would study the learning materials prior coming to class, and the class time is for inquiries, applications ans assessments. Thus this model would allow the students greater focus on the application of knowledge and avoid the students to be surface learners. Rudneva, Valeeva, Zakirova, Guslyakova & Pavlova (2020) made an research on the influence of flipped classroom approach. They studied the performance of 35 Russian students and the students are requested to complete listening assignments based on YouTube videos weekly and followed up by on-site discussions. Research result of their pre- and post-test score was analyzed by paired samples t-test to assess the differences between the mean scores of the experimental group and observation group. The post-test revealed a obvious improvement regarding students’ listening comprehension skills in experimental group. And according to the result,flipped classroom model is of great benefit to improve learners’ listening comprehension skill. The research of Baharum et al. (2020) also confirmed the effectiveness of the flipped classroom. The stated that flipped learning method assisted by M-Learning application does increase learning effectiveness.

According to Hardy & Kim (2000), new technology supplement such as computer and mobile device have its advantages in teaching listening of a language. In developing content materials, they demonstrated that activities by computers are superior to the ones by textbook in supporting listening comprehension skills by ensuring interactivity. They also indicated that interactivity could be achieved in computer-assisted study by a) providing a variety of formative immediate feedback which guides students through the language; b) giving students the opportunity to react after feedback and self-correcting the messages; c) supplying students options within an activity, such as HELP panels, hints, glossaries, to name a few; and d) using multimedia, e.g. sound, video,graphics, and animations. Regarding on this issue, this meta-analysis seeks to present a relatively through and comprehensive investigation of the effects of teaching listening in English under technology enhanced learning approach with the assistance of device like computer, mobile device and multimedia equipment.

Computer assisted language learning (CALL) has been known as one of the technology-enhanced language learning approaches. Computer-assisted language Learning is an approach to teaching and learning in which the computer and computer-based resources such as the Internet are used to present, reinforce and assess material to be learned. It usually includes a substantial interactive element. It also includes the search for and the investigation of applications in language teaching and learning. Except for self-study software, CALL is meant to supplement face-to-face language instruction, not replace it.

The technologies used in CALL instruction generally fall into two categories,software and Internet-based activities. Software used in a CALL environment could be designed specifically for second or foreign language learning or adapted for this purpose. For example, most language textbook publishers offer educational software of some sort, for both supporting a paper textbook or to standing alone for students’ self-study. Internet activities vary considerably. It may be a online versions of software where the learner interacts with a networked computer, or computer-mediated communication that learner interacts with other people via the computer, or applications that combine these two elements. Nowadays, web sites that cater to foreign-language learners, especially those learning English, are so numerous and varied that it comes to be very difficult to determine where to begin (Chapelle, 2001). Except computer, there are also mobile device and other technology-enhanced resources like multimedia and ICT that would assist the language learning.

**Variable & Research Questions**

The independent variables evaluated in this meta-analysis is technology enhanced learning approach; the moderator variables are the type of treatment CALL (Computer Assisted Language Learning) or MALL (Mobile Assisted Language Learning), and length of treatment. Other factors such as the research settings, students’ age were also coded. The dependent variable is the effect size derived from the included 20 primary studies.The the importance of the independent variables is already self-evident, the rational for investigating the moderator variables needs further explanation and major moderators are discussed below.

***Research Setting***

 Research setting can be divided into two categories, foreign language (FL) and second language (SL). Foreign language setting is one where the learner studies a language that is not the primary language of the linguistic community (for example, an L1 Korean speaker learning English in Korea); second language setting is one in which the learner’s target language is the primary language of the linguistic community (for example, an L1 Korean speaker learning English in the United States). Since the dynamics of these two settings are different, the technology enhanced approach may be different accordingly. The included studies of this meta-analysis are all under EFL setting.

***Length of treatment***

Treatment duration of the included studies varies. The impact of this variable should usually be evaluted with other variables like the learner difference, it is interesting to examine whether treatment length alone has any influence on the effects of technology enhanced learning approach (Li, 2012).

***Learners’ Age***

The learners in the included primary studies has varied age range. They could be young primary school students or elder university school students, but no study examined age as an independent variable. This meta-analysis seeks to determine if learners’ age have influence on the effect of technology enhanced learning approach.

As we can see form above, the methodological or learner characteristics could potentially affect the effectiveness of technology enhanced learning approach. This meta-analysis aims to answer the following questions：

1. What is the overall effect of technology enhanced learning/teaching approach in the improvement of English listening skill?
2. Do different types of technology enhanced approach impact English listening skill learning differently?
3. Does the length of treatment have influence on the effect?

**Method**

**Identify primary studies**

To locate related primary studies, some methods were applied. Firstly, the researcher use electronic database in the fields of applied linguistics and education ERIC and Jstor to search for related studies. The keywords and combination of keywords were applied. They include, *computer, technology, teaching listening, teaching English, CALL, multimedia, MALL, mobile device, listening learning, language education, teaching approach*. The researcher also applied ancestry chasing, which is tracking the reference in primary research and computer search by google with above mentioned keywords was also applied.

*Inclusion/Exclusion Criteria*

The inclusion criteria of this meta-analysis is as follows:

1. One of the independent variable should be technology enhanced learning/teaching approach, no matter it is computer assisted language learning, or mobile assisted language learning or learning with multimedia.
2. The primary study should focus on the English listening skills of students, or have on overall English language skills but with study/analysis on English listening skills. For example, some research studies the influence of CALL on students’ TOEFL score but with analysis on students’ listening score. Such a study could be included according to this criteria.
3. The study should be experiential or quasi-experimental and have experimental and control groups or pre and post test so that learning/teaching effect after treatment could be observed through comparing the gains of experimental group and gains of the control group.
4. The effect of technology enhanced learning/teaching approach could be disentangled from the effects of other factors.
5. It should utilize statistical analyses that investigated mean differences so that there would be necessary data to compute the effect size and do deeper data analysis.
6. It should be published in English.

*Exclusion Criteria of this meta-analysis is as follows:*

1. It does not have enough data reported for the computation of effect size.
2. The research design makes it impossible to disentangle the effect of technology enhanced learning/teaching approach from other factors in the treatment.
3. It is not about English language learning.
4. It was published before the year of 2000.

**Coding**

Since the coding of a meta-analysis is of vital importance and complicated, the coding of this meta-analysis was done carefully with modification and revisions. Firstly, titles of the searched studies were screened for clearly ineligible publication. Then the keywords and abstracts were coded for eligibility. After that, the remaining studies were retrieved and coded at the full text level, with focus on the methodology and data analysis parts.

*Treatment instrument*

There are many treatment types used in the included studies to improve students’ listening comprehension ability in English. Some applied CALL (Computer Assisted Language Learning), some applied MALL (Mobile Assisted Language Learning) while some applied multimedia methods such as video, podcast and PPT. They were coded as either CALL or MALL according to the tool used.

*Timing of Posttest*

According to Keck, Iberri-Shea, Tracy-Ventura, and Wa-Mbaleka (2006), if the posttest of a treatment in a study is less than 7 days, then it is immediate posttest; if it was applied 8-29 days after the treatment, them it s short-term delayed; if it was applied 30+ days after the treatment, it was long-term delayed posttest.

*Measure of Proficiency*

Like Keck et al (2006) indicated, if the participants’ proficiency level was evaluated according to the researcher’s persona; evaluation, then it is impressionistic judgment; if according to the enrollment in a language class or program, then it is institutional status; if it used a placement test or a test created by the researcher, then it is in-house assessment; if based on participants’ performance on an established test such as TOEFL or the ACTFL Proficiency Guidelines, then it is standard test.

*Length of Treatment*

In the meta-analysis of Li (2010), he coded the length of treatment as short treatment if it was less than 50 min, medium if between 60-120 min, long if over medium. Since the cutoff of the treatment length could be arbitrary, considering the actual length of overall included studies, this meta analysis would have a different coding category. If the treatment was one month or less, it was coded as short term; if more than one month but below two month, it was coded as medium term; if more than two month, then it was long term.

*Learner’s Age*

In Li (2010), for studies that reported participants’ average age, the original mean age was recorded; for studies that reported participants’ enrollment at school, such as “university students,” “freshmen,” and so on, their age was estimated (e.g., 12 for “sixth graders”’ and 18 for “freshmen”); for studies that reported a narrow range such as “18–20,” the median (19) was taken as the average age; for studies that did not provide any related information or provided a wide range such as “18–55,” they were coded as such and were not included when the age effect was investigated. This study would applied the same age coding method.

*table 1: coding result of included studies*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Included Study | Treatment Instrument | Age | ESL/EFL | Length of Treatment | Timing of Post-test | Measure of Proficiency |
|
| Khoshsima & Mozakka (2017) | CALL | N/A | EFL | medium term | immediate | standard |
| Ampa (2015) | CALL | 20 | EFL | N/A | immediate | in-house assessment |
| Ardiansyah (2018) | CALL | 19 | EFL | long term | immediate | in-house assessment |
| Deng (2018) | CALL | 19 | EFL | N/A | immediate | in-house assessment |
| Faramarzi (2019) | CALL | N/A | EFL | long term | immediate | in-house assessment |
| Han & Rensburg (2014) | CALL | 19 | EFL | medium term | immediate | in-house assessment |
| Heidar & Afgharin (2015) | CALL | N/A | EFL | short term | immediate | in-house assessment |
| Hsu, Hwang & Chan (2014) | CALL | 20 | EFL | N/A | immediate | in-house assessment |
| Ikonta & Ugonna (2015) | CALL | 19 | ESL | N/A | immediate | in-house assessment |
| Khoii & Aghabeig (2009) | CALL | 15 | EFL | medium term | immediate | standard |
| Kilickaya (2007) | CALL | 19 | EFL | medium term | immediate | standard |
| Lan (2015) | CALL | 19 | EFL | long term | immediate | in-house assessment |
| Qasim & Fadda (2013) | CALL | 21 | EFL | medium term | immediate | in-house assessment |
| Rahimi & Soleymani (2015) | MALL | 18 | EFL | long term | immediate | standard |
| Sarani, Behtash, & Arani (2014) | CALL | N/A | EFL | long term | immediate | in-house assessment |
| Sehati (201&) | CALL | N/A | EFL | medium term | immediate | standard |
| Sejdiu (2017) | MALL | 8 | EFL | long term | immediate | in-house assessment |
| Vahdat & Eidipour (2016) | CALL | 13 | EFL | medium term | immediate | in-house assessment |
| Yamada, Kitamura, Shimada, Utashiro, Shigeta, Yamaguch, Harison, Yamuchi, & Nakahra (2011) | MALL | N/A | EFL | short term | immediate & long-term delayed | in-house assessment |
| Ramos & Arturo (2017) | MALL | 19 | EFL | N/A | immediate | in-house assessment |

**Data Analysis**

**Effect Size Calculation**

If a study have a control group and experimental group with pre and post-test, and the only difference between the experimental group and control is caused by the application of technology-enhanced learning method, then effect size were computed by comparing the difference of pre and post-test of experimental group and the control group.

If a study had control group and the only difference between the experimental group and control is caused by the application of technology-enhanced learning method, then effect size were computed by comparing the experimental group and the control group.

If a study had no experimental and control group but pre and post-test, and the only difference between the experimental group and control is caused by the application of technology-enhanced learning method, then effect size were computed by comparing the difference of pre and post test.

The equation applied is:



While mean difference is the difference between the mean change score of the experimental and control group or between the mean score of the experimental group and control group. The PooledSD (pooled standard deviation) was calculated as:



While  is the number of experimental group,  is the standard deviation of the experimental group and calculated as:



If the study only reported the t value or F value, the following equation is applied:





or



and  refers to the sample size of the two groups.

Effect size of the 20 included studies are shown in the following table:

*table 2: calculated effect size of included study*

|  |  |
| --- | --- |
| *Included Study* | *d* |
| Ampa (2015) | 0.219910521 |
| Ardiansyah (2018) | 0.195384071 |
| Deng (2018) | 0.044202962 |
| Faramarzi (2019) | 0.063578482 |
| Han & Rensburg (2014) | 0.431694 |
| Heidar & Afgharin (2015) | 0.226437376 |
| Hsu, Hwang & Chan (2014) | 0.042926237 |
| Ikonta & Ugonna (2015) | 0.062411116 |
| Khoii & Aghabeig (2009) | 0.185091657 |
| Khoshsima & Mozakka (2017) | 0.391938711 |
| Kilickaya (2007) | 0.195672570 |
| Lan (2015) | 0.041704384 |
| Qasim & Fadda (2013) | 0.215143237 |
| Sejdiu (2017) | 0.224860719 |
| Rahimi & Soleymani (2015) | 0.205062103 |
| Ramos & Arturo (2017) | 0.093443994 |
| Sarani, Behtash, & Arani (2014) | 0.488593417 |
| Sehati (201&) | 0.377244072 |
| Vahdat & Eidipour (2016) | 0.154868757 |
| Yamada, Kitamura, Shimada, Utashiro, Shigeta, Yamaguch, Harison, Yamuchi, & Nakahra (2011) | 0.084972249 |

After the effect size of the effect size is calculated, the weighted effect size was calculated, and the following equations are applied to calculate:



Here “v” is the variance of the estimate and could be calculated as:



While  and  are the sample size of the study and *d* is the effect size. Then the weighted mean effect size is calculated as:



That is the sum of the weight multiplied by the according effect size.

By doing that, the weighted effect size was calculated, and the weighted effect size, say  of the included study, is ***0.14*** ( originally 0.143369361).

To test the statistical significance of the mean effect size, a ***z*** test was conducted:



Here the  is the weighted effect size, and  is the standard error of the mean effect size which could be calculated as:



and *w* is the weight of each study.

Then *z* value of the included studies is ***2.78*** (originally 2.781623578),which is bigger than the critical value 2.58 at α=0.05. That means the mean effect size is statistically significant.

To test the homogeneity of the effect size, a Q test was conducted:



While *w* is the weight of the effect size, *d* being the effect size and  the mean of effect size. The calculated value here is ***-20.28*** (originally -20.28492611), which is smaller than the critical value 30.144 (p<.05) in *chi-square table.* Itreveals that the effect size is homogeneous and the distribution of the effect size around the mean is caused by sampling error alone.

**Moderator Analysis**

While the Q test indicates that there is no need to proceed any moderator analysis since it revealed that the effect size of included study is homogeneous, the researcher still conducted post hoc pair-wise  test for moderator analysis.



 is the sum of the weight with in each group,  is the mean effect size with in each group.

  test was firstly conducted to analysis id there is many difference between the CALL group and MALL group and there =0.19 (originally 0.186535371), see *table 3,* which means that this “CALL or MALL” moderator has significant impact on the variation of the group of effect size.

Similarly,  test was also tested to see if the length of the treatment have significant influence on the set of effect size and there =0.44(originally 0.442986205). see *table 4,* and which indicates that the length of the treatment have significant influence on the distribution of effect size among the groups.

*table 3: description of*  test

|  |  |  |
| --- | --- | --- |
|  |  |  |
| *CALL* | 303.98 | 0.21 |
| *MALL* | 72.45 | 0.15 |
| *=0.19* |  |  |

*table 4: description of*  test

|  |  |  |
| --- | --- | --- |
|  |  |  |
| *short term* | 34.39 | 0.16 |
| *medium* | 74.12 | 0.27 |
| *long term* | 161.94 | 0.20 |
| *=0.44* |  |  |

**Result**

The weighted effect size,  is o.14 with Z value 2.78 which is higher than the critical value and makes it statistically significant. So, generally speaking, the technology enhanced learning approach, with the help of computer, mobile devices or other multimedia materials works better than traditional way of learning English listening skills. Moderator analysis on the effect difference between CALL and MALL as well as that between short, medium and long term term treatment, shows  value of 0.19 and 0.44 correspondingly. According to this data, both of these two moderators have influence on the effect size. While the data is viewed together with mean effect size of each set, we could find that the CALL works better than MALL and the longer the treatment, the better the effect would be. Moreover, the length of treatment have much more significant influence on effect size than treatment type.

**Discussion**

Seeing above results of this meta-analysis, we could get answers for the research questions already. Firstly, the overall weighted effect size of technology enhanced learning/teaching approach in the improvement of English listening skill generated by the 20 included study is 0.14, with a z value higher than critical value, showing than it is statistically significant. That means the technology-enhanced learning does benefit the learning of listening skills of EFL language learners. According to Motteram (2013), digital technologies like computer program, multimedia, mobile device, are ideally placed to help teachers working with learners, and learners working independently, to do the necessary ‘languaging’ which makes learners’ language development possible. This meta-analysis further proved it in a statistical level. In the aspect of the effect of different types of technology, (here in this meta-analysis different learning aids), the  value of 0.19 is relative, which means that different learning aids do have different effect size. Seeing the effect size separately, we would found that CALL benefit learners listening skill better than MALL. A computer could provide the learners with various learning material based on individual needs and encourage learners to be more creative and original by offering them multiple options of learning methods and variety types of exercises. “Innovations such as CALL prove that computers are dominating the world of education” (Chaudhary & Devi, 2019). While content-related MALL activities appear to subscribe to a model that materials are delivered to learners via text-messaging or a website.however, very few activities , support learner collaboration or communication (Derakhshan, 2011). And that might be the cause of its weaker effect. Then, does the length of treatment have influence on the effect? The answer is absolutely yes, since there is a high  value of 0.44, long term treatment works betters than medium term one and medium term treatment surpass short term treatment. Moreover, the  value of this moderator is much big than that of the other one( types of applied technology/learning aids)which means that the length of treatment have greater impact on the final outcome of a program.

Such result of this meta-analysis would give some implication for English teachers and language learners. Firstly, during the learning process, it’s better to apply available learning aid. Suitable application of learning aids would help the learner acquire listening skills better. The types of learning aid or learning device should also be carefully selected since it would influence the outcomes and if there is an option, choose CALL but MALL in case both methods are suitable. Then, the application of new learning approach should last for a period of time so that it would benefit well. One should not expect big difference in a very short time. For further research, this meta-analysis is based on 20 previous studies and because the limitation of the data included, this study only reflects above findings in a limited range and moderators. Future study may study on moderators such as learners’ age, gender, mother tongue or research setting (EFL or ESL) to enrich findings of topic since these may have influence on the final learning outcomes.

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