

THE INTERACTION OF TEXT-TO-SPEECH AND LEARNING MOTIVATION ON PRE-SERVICE TEACHERS' READING COMPREHENSION ABILITY

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Abstract

Some studies have proven that the utilization of text-to- speech has many good influences. However, learning motivation also affects learners' reading comprehension ability. Meanwhile, good reading comprehension ability is a 'must' for learners especially pre-service teachers since they are supposed to be professional future teachers. This study aimed to investigate the impact of text-to-speech and learning motivation on pre-service teachers' reading comprehension ability. This research involved sixty pre-service teachers who were at fourth semester of English Education Study Program of PGRI University of Palembang, and applied factorial design. Some results were revealed: (1) there was a statistically significant difference in reading comprehension ability between pre-service teachers who were taught using text-to- speech and those who were not; (2) there was no statistically significant interaction effect of text-to-speech and learning motivation on pre-service teachers' reading comprehension ability.

Keywords: text-to-speech, learning motivation, pre-service teachers, reading comprehension ability.

INTRODUCTION

Reading is a receptive skill which supports learners to gain knowledge. Therefore, learners should have this skill well-sharpened. According to PISA, reading performance list from PISA, Indonesia was below average since 2000 until 2009 (OECD, 2010). Furthermore, in 2012, Indonesia's mean score in reading was 396. Meanwhile, OECD average is 496 (OECD, 2013). In other words, Indonesia's students reading ability is below average. There are many ways to improve learners' reading comprehension skill. One

The use of technology in education especially English language teaching has a huge effective influence; it provides rich, qualified and more flexible learning; it enables student to have technology literacy; it leads to authenticity and autonomy; it keeps teachers up-to-date with the development of English language teaching (Ibrahim, 2010; Stanley, 2013; Slaouti, Onat-Stelma, & Motteram, 2013; Kern, 2013). Moreover, it may increase teachers and students' creativity as technology expands an open path to any information which they need. One technological tool which gives learners access to a very authentic material is text-to-speech. This software allows learners learn more independently and efficiently by having a text read aloud to them (Missouri Assistive Technology, 2010). Parr (2011) summarized that it will be "an authentic trustworthy voice, meaning-making and valuable lifelong tool" for learner.

When some educators believe that methods of learning determine learners' achievement, another side also believe that motivation does matter for students in learning both inside and outside their school. In 1998, Snow, Burns, and Griffin conducted a study related to reading difficulties (Australian Government, Department of Education, Science, and Training, 2005, p. 19). The study found that motivation to read for various goals affects students' progress in learning. Also, Assessment Reform Group (2002) believes that increasing and preserving students' learning motivation and better learning will produce better school outcomes. Furthermore, undergraduate theses which were conducted to investigate level of motivation highlight that the higher motivation will produce higher achievement (Firdaus, 2010; Holandyah, 2009).

This research involved pre-service teachers as the participants for some reasons. Cheng (2009) states that pre-service education must provide "prospective teachers with the necessary subject knowledge, professional skills and attitudes for effective knowledge delivery to students". However, educational researchers, Brookhart and Freeman (1992), Fullan (1991), Goodlad (1990) and Kagan (1992) had proposed better prepare pre-service teachers because novice teachers confess that they are not well-prepared to teach by their undergraduate education program (Stuart & Thurlow, 2000). So, preparing pre-service teachers before they work on their field is at a critical point which requires the attention from teacher training institutes.

Those motives brought this research to explore the effects of text-to-speech and learning motivation on the pre-service teachers' reading comprehension ability. Hopefully, teachers could utilize text-to-speech in teaching reading comprehension for faculty of teacher training. Instead of native speaker, they could use text-to-speech in order to give an authentic material to their students.

Also, learners could learn more independently because the text-to-speech software can be downloaded easily. Learners could have access to an authentic learning material in order to improve their reading achievement. Finally, this results of this research would be a consideration for conducting further research on the exploration of text-to-speech for other skills and purposes.

DISCUSSION

This study involved 60 participants selected randomly and divided into experimental and control groups. In each group, there were three participants' categories; high, medium and low motivation. A TOEFL paper based test reading comprehension was used as the test instrument for pre and posttest. To categorize them based on their motivation, a learning motivation questionnaire was given. The data were analyzed and revealed some results.

The first, in order to find out the difference between pre-test and post- test scores in each groups, the researcher analyzed the data using sample t-test analysis. Here is the result of paired sample t-test:

Table 1. Experimental Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	43.6757	30	11.11502	2.02932
	Posttest	51.0260	30	12.45815	2.27454

The table shows that mean scores of pre-test and post-test were 43.67 and 51.03. If it is seen from the mean scores, it can be said there was a difference between pre-test and post-test. However, the statistical analysis is still needed in order to see the significance of the difference.

Table 2. Experimental Paired Samples Test

		Pair 1
		Pretest – Posttest
Paired Differences	Mean	7.35033
	Std. Deviation	8.97600
	Std. Error Mean	1.63879
	95% Confidence Interval Lower of the Difference	10.70203
	Upper	3.99864
T		4.485
Df		29
Sig. (2-tailed)		.000

The table above shows the result of paired sample t-test in experimental group. From the table, it can be seen that the „Sig. (2tailed)“ row, it was found that $p = 0.000$. It shows that $p < 0.050$ which means there was a statistically significant difference between the pre-test and post-test scores in experimental group.

After analyzing using paired sample-t-test, independent sample t-test was also analyzed in order to find out the significant difference in reading comprehension ability between pre-service teachers who were taught using text-to-speech and those who were not. The data which was compared were the post-test scores from both groups. Here is the result of the analysis:

Table 3. Experimental and Control Groups' Post-Test Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Post_test	Exp	30	51.0260	12.45815	2.27454
	Control	30	38.3760	11.61395	2.12041

The table shows that the post-test mean scores of experimental and control group were 51.03 and 38.38. Looking at them, the difference between the two groups was obviously shown. However, to see its significance, independent sample t-test was utilized. Here is the result of the analysis.

Table 4. Independent Samples Test

		Post_test	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	.388	
	Sig.	.536	
	T	4.068	4.068
	Df	58	57.717
	Sig. (2-tailed)	.000	.000
t-test for Equality of Means	Mean Difference	12.65000	12.65000
	Std. Error Difference	3.10961	3.10961
	95% Confidence Interval of the Difference		
	Lower	6.42545	6.42480
	Upper	18.87455	18.87520

The table shows that the data were equal since the F value was 0.388 ($F > 0.05$). Now, the Sig. which was 0.536 is higher than 0.05 shows that „Equal variances“ would be used. According to Cohen et al. (2007, p. 543), to decide which of the two use (i.e. „Equal variances assumed and Equal variances not assumed“) should be used, the value of sig“ from Levene’s test analysis should be considered. If the ρ value > 0.05 , the researcher need to use equal variances assumed. Then, if the ρ value shows a significant difference ($\rho < 0.05$, the researcher need to use equal variances not assumed. Therefore, the first column (i.e. equal variances assumed) was used in this case. In the table, it was found that ‘Sig. (2-tailed) was 0.000 ($\rho < 0.05$). Thus, it can be implied that the null hypothesis was rejected. On the basis of data analysis results, there were some findings which need interpretation. Looking at the participants reading comprehension ability scores, both experimental and control group data showed that there was a slightly increasing trend in the participants“ pre-test and post-test scores. Despite the participants“ motivation score, those who were not in the highly motivated group performed improvement. However, experimental group has shown a higher difference in its pre-test and post-test scores rather than control group.

The answers of the two problems in this study were revealed. Firstly, there was a statistically significant difference in reading comprehension ability between pre-service teachers who were taught using text-to-speech and who were not but, the effect of the treatment was modest. This phenomenon showed that text-to-speech modestly influenced the participants' reading comprehension ability. In this case, it was shown by the participants' scores. This finding verified some other studies' findings which confirmed that text-to-speech helps reader to decode efficiently and confidently, give positive effect on reading, comprehension, and enable learners to learn independently (Iowa Department of Education, 2006-2007, p. 14; Parr, 2011, p. 3). It also can develop reading endurance and students will gain "more comprehensible input and building language acquisition skills" (Drezek, 2007, p. 49). Moreover, Parr (2013) found that text-to-speech can support comprehension because learners' concentrations increase when a text is read aloud. The result of this study was also supported by a longitudinal study conducted by Iowa Department of Education (2006-2007). The study discovered that from teachers' point of view, text-to-speech helps learners to comprehend the content in their books when they are reading. The same opinion was shown by students who agreed that text-to-speech helps them with their reading. This finding also verified some other studies' findings which attested that text-to-speech helps reader to decode efficiently and confidently, strongly give positive effect on reading, comprehension, and enable learners to learn independently (Iowa Department of Education, 2006-2007, p. 14; Parr, 2011, p. 3). Moreover, it also can develop reading endurance and students will gain "more comprehensible input and building language acquisition skills" (Drezek, 2007, p. 49).

The second finding was that there was no statistically significant interaction effect of text-to-speech and learning motivation on the pre-service teachers' reading comprehension ability. It can be seen from the result of twoway Anova analysis and the participants' score which showed highly motivated learners got the lowest score in post-test. Meanwhile, participants who had low motivation performed better than the highly motivated ones. Surprisingly, the highest post-test achievement was gained by participant who had low learning motivation. Meanwhile, the participant who had the highest motivation got the lowest scores in the pre-test and post-test. Even though many studies found that motivation has strong influence on learners' achievement (Kitjaroonchai, 2013; Knoll, 2000; Remali, Ghazali, Kamaruddin, & Kee, 2013; Taboada, Tonks, Wigfield, & Guthrie (2008), the finding of this study did not confirm the same finding. In contrast, this study was supported by Middleton (2011) who found that learners might be affected by other factors beyond motivation. Furthermore, Harmer (2001, p. 208) argues that negative expectation may be one factor which influence their reading comprehension. The negative expectation is influenced by their prior experience related to reading activity. The participants of this study have joined TOEFL before and most of them agreed that the reading test in TOEFL was difficult for them. Their prior experience support negative expectation. This negative expectation caused influenced the participants' improvement in their reading comprehension achievement. In this study, learning motivation is a moderator variable which was expected could influence learners' reading achievement. However, the result found that learning motivation had nothing to do with the participants' reading comprehension achievement. In other words, their learning motivation did not work in this case. It was obviously proven that text-to-speech was influential factor on the participants' reading comprehension achievement instead of

motivation. Furthermore, text-to-speech was good for low motivated learners rather than highly motivated ones as this study found that the low motivated participants performed better than the highly motivated ones. Therefore, it can be interpreted that learning motivation did not significantly affect learners' achievement in reading comprehension.

In conclusion, this study verified that text-to-speech can contribute to pre-service teachers' reading comprehension ability. It has been proven that text-to-speech can increase pre-service teachers' reading comprehension achievement. Then, assumption that motivation can influence pre-service teachers' reading comprehension ability was not revealed in this study. So, instead of motivation, text-to-speech which was harnessed in this study had significant influence on the pre-service teachers' reading comprehension.

CONCLUSION

This study investigated the effect of text-to-speech and learning motivation on pre-service teachers' reading comprehension ability. Text-to-speech is a computer based reader which is currently also available in some smartphone operation system. And learning motivation is a personality factor. Then, reading comprehension is the ability to comprehend a text fully. The data were analyzed using t-test, two-way Anova, and effect size. The normality and homogeneity of the data showed that the data in this study were normally distributed and had the same variance. The data were statistically analyzed using SPSS 20. But, since the value of effect size for t-test was not available in SPSS 20, the analysis was done manually.

In this study, two objectives were stated at the beginning of this research. The first question, whether or not there was a significant difference in reading comprehension ability between pre-service teachers who were taught using text-to-speech and those who were not, was answered clearly. The first finding of this study revealed that pre-service teachers who were taught using text-to-speech significantly achieved better than those who were not even though the effect was modest. This finding then confirmed that text-to-speech is useful for learners to increase their reading comprehension ability (Iowa Department of Education, 2006-2007; Parr, 2011; Drezek, 2007).

Different result was gained from the analysis of the interaction effect of text-to-speech and learning motivation on pre-service teachers' reading comprehension ability. It was found that there was no significant interaction effect of text-to-speech and learning motivation on pre-service teachers' reading comprehension ability. The second finding of this study showed a contrastive finding from other previous studies which proved that learning motivation has contribution to learners' academic achievement especially reading comprehension (Firdaus, 2010; Holandyah, 2009; Wulandary, 2013).

Overall, this study has revealed that both text-to-speech had something to do with the pre-service teachers' reading comprehension. However, the effect was modest. Pre-service teachers are candidates who will teach the next generation. They are supposed to be able to transform their knowledge to their students in the future time. It is very well-known that reading is the window of the world. As teacher candidates, pre-service teachers should be able to comprehend any text. Otherwise, they will be left behind. Various media can be used to increase learners' reading comprehension ability. The

results of this study have obviously emphasized that text-to-speech could make significant difference on the participants' reading comprehension achievement. Meanwhile, learning motivation did not have any contribution on pre-service teachers' reading comprehension ability.

By considering the results of this research, it is very suggested for teachers to use text-to-speech as their tool in teaching English as foreign language. However, text-to-speech is not limited for only reading comprehension. It can also be useful to enhance other aspects of language such as pronunciation, writing, and vocabulary (Kilickaya, 2009; Iowa Department of Education, 2006-2007; Aoki, 2009; Kurzweil Educational Systems, 2004; Parr, 2011).

In conclusion, despite learners' motivation, text-to-speech is very good to use in teaching reading comprehension. For further research, the use of text-to-speech for other language skills and its influence on learning interest could become interesting to investigate.

REFERENCES

- Aoki, K. (2009). Effective use of text-to-speech technology for Japanese learners of English. *NTUT Education of Disabilities*, 7, 1-10. Retrieved from <http://www.tsukuba-tech.ac.jp/>
- Assessment Reform Group. (2002). *Testing, motivation, and learning*. Cambridge, UK: Author.
- Australian Government, Department of Education, Science, and Training, National Inquiry into the Teaching of Literacy. (2005). *Teaching reading, literature review*. Retrieved from <http://www.research.acer.edu.au/>
- Brookhart, S., & Freeman, D. (1992). Characteristics of entering teacher candidates. *Review of Educational Research*, 62(3), 37-60. Chang, I. Y., &
- Chang, W. Y. (2012). The effect of student learning motivation on learning satisfaction. *The International Journal of Organizational Innovation*, 4(3), 281-305. Retrieved from <http://search.proquest.com/>
- Cheng, C. Y. (2009). Paradigm shift in pre-service teacher education: Implications for innovation and practice. In C.P. Lim, K. Cock, G. Lock, and C. Brook (eds.), *Innovative Practices in Pre-Service Teacher Education: An Asia-Pacific Perspective*, 3-22. Rotterdam: Sense Publishers. Retrieved from <http://www.sensepublishers.com/>
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed). New York, NY: Routledge. Retrieved from <http://www.stiba-malang.ac.id/>
- Drezek, J. (2007). *Adult ESOL reading comprehension and text-to-speech software* (Master's thesis). The University of Texas, Arlington.
- Firdaus, M. (2010). *The influence of directed reading activity strategy and learning motivation toward students' reading comprehension at the tenth grade students of SMA*

- Pembina Palembang (Unpublished master's thesis). PGRI University of Palembang, Palembang.
- Fullan, M. (1991). *The new meaning of educational change*. New York, NY: Teachers College Press.
- Goodlad, J. (1990). *Teachers for our nation's schools*. San Francisco, CA: Jossey-Bass.
- Harmer, J. (2001). *The practice of English language teaching* (3rd ed.). Harlow, UK: Pearson Education.
- Holandyah, M. (2009). *The influence of mind mapping technique and students' motivation to develop students' writing achievements to the fourth semester students of PGRI University Palembang* (Unpublished master's thesis). PGRI University of Palembang, Palembang.
- Ibrahim, A. M. I. (2010). Information & communication technologies In ELT. *Journal of Language Teaching and Research*, 1(3), 211-214. doi:10.4304/jltr.1.3.211-214
- Iowa Department of Education. (2006-2007). *Summary report of the Iowa text reader longitudinal study 2006–2007*. Retrieved from <https://www.kurzweiledu.com/>
- Kagan, D. (1992). Professional growth among preservice teachers and beginning teachers. *Review of Educational Research*, 62(3), 129-168
- Kern, N. (2013). Technology-integrated English for specific purposes lessons: Real-life language, tasks, and tools for professionals. In G. Motteram (Eds.), *Innovations in learning technologies for English language teaching* (pp. 87-116). London, UK: British Council. Retrieved from <http://www.britishcouncil.org/>
- Kilikaya, F. (2009). Improving pronunciation via accent reduction and text-to-speech software. In T. Koyama, J. Noguchi, Y. Yoshinari, & Iwasaki (Eds), *Proceedings of WorldCALL 2008 Conference* (pp. 135-137). Retrieved from <http://www.j-let.org/~wcf/proceedings/d097>.
- Kitjaroonchai, N. (2013). Motivation toward English language learning of students in secondary and high schools in education service area office 4, Saraburi Province, Thailand. *International Journal of Language and Linguistics*, 1(1), 22-33. doi: 10.11648/j.ijll.20130101.14. Retrieved from <http://www.sciencepublishinggroup.com/>
- Knoll, C. L. (2000). *The relationship between motivation and reading comprehension* (Master's thesis). Available from Grand Valley State University database. (Paper 497).
- Kurzweil Educational Systems, Inc. (2004). *Using technology as a solution for English language learners in higher education*. Bedford, MA: Kurzweil Educational Systems. Retrieved from <https://www.kurzweiledu.com/>
- Lightfoot, D. (1999). *The development of language*. Oxford: Blackwell Publishers.

- Middleton, M. E. (2011). Reading motivation and reading comprehension (Master's thesis). Retrieved from <http://www.etsd.ohiolink.edu/>
- Missouri Assistive Technology.(2010). Text-to-speech (TtS) and accessible instructional materials (AIM): An implementation guide for use of TtS and AIM in secondary classrooms. Missouri: National Center on accessible instructional materials at CAST. Retrieved from <http://aim.cast.org>.
- Motteram, G. (Ed.). (2013). Innovations in learning technologies for English language teaching. London, UK: British Council. Retrieved from <http://www.britishcouncil.org/>
- OECD. (2006). Education at a glance: Highlights. OECD Publishing. Retrieved from <http://www.oecd.org/>
- OECD. (2010). PISA 2009 Results: Learning Trends: Changes in student performance since 2000 (Volume V). Retrieved from <http://dx.doi.org/10.1787/9789264091580-en>
- OECD. (2013). Education at a glance 2013: OECD Indicators, OECD Publishing. Retrieved from <http://dx.doi.org/10.1787/eag-2013-en>
- Parr, M. (Ed.). (2011). The voice of text-to-speech technology: One possible solution for struggling readers? [Monograph]. Retrieved from <http://www.edu.gov.on.ca/eng/literacynumeracy/>
- Parr, M. (2013). Text-to-speech technology as inclusive reading practice: Changing perspectives, overcoming barriers. LEARNING Landscapes, 6(2), 303-322. Retrieved from <http://www.learniglandscapes.ca/>
- Remali, A. M., Ghazali, M. A., Kamaruddin, M. K., & Kee, T. Y. (2013). Understanding academic performance based on demographic factors and learning styles. International Journal of Asian Social Science, 3(9), 1938-1951. Retrieved from <http://www.aessweb.com/>
- Slaouti, D., Onat-Stelma, Z., & Motteram, G. (2013). Technology and adult language teaching. In G. Motteram (Eds.), Innovations in learning technologies for English language teaching (pp. 67-86). London: British Council. Retrieved from <http://www.britishcouncil.org/>
- Snow, C. E. (2002). Reading for understanding: Toward a research and development program in reading comprehension. Santa Monica, CA: RAND. Retrieved from <http://www.rand.org/>
- Snow, C. E., Burns, M S., & Griffi N. P. (Eds.) (1998). Preventing reading difficulties in young children. Washington, DC: National Academy Press.
- Stanley, G. (2013). Integrating technology into secondary English language teaching. In G. Motteram (Eds.), Innovations in learning technologies for English language teaching (pp. 44-66). London, UK: British Council. Retrieved from <http://www.britishcouncil.org/>
- Stuart, C., &

Thurlow, D. (2000). Making it their own: Pre-service Teachers' experiences, beliefs, and classroom practices. *Journal of Teacher Education*, 51(2), 113-121. Retrieved from <http://www.auburn.edu/>

Wulandary, A. (2013). The Correlation among reading attitude, English Learning Motivation, and Reading Comprehension Achievement of the Eleventh Graders of MAN 3 Palembang (Unpublished master's thesis). Sriwijaya University, Palembang.