Letter from the 2013 IEEE TCLT Early Career Award Winner

Rustam Shadiev, Senior Member, IEEE

I am Dr. Rustam Shadiev, Professor at the School of Education Science of Nanjing Normal University, China. I am also a Distinguished professor of Jiangsu province, China. In addition, I am a Fellow of the British Computer Society and a Senior Member of the Institute of Electrical and Electronics Engineer. The Elsevier included my name in the list of Most Cited Chinese Researchers in the field of Education in 2020 and 2021. My research interest includes advanced learning technologies to support language learning and cross-cultural education.

I received “Early Career Researcher Award in Learning Technologies” in 2013 for my contribution to the field of learning technologies. This is because of my research on Effects of Applying Speech-to-Text Recognition for One-way Lectures and Group Learning Activities on Learning Performance in Online Synchronous Cyber Classroom.

A survey of related studies on this topic showed several challenges in online synchronous teaching and learning environments. Some of them were the presence of poor audio quality due to unstable internet connection, students were distracted during online classes or they just missed their learning activities. These issues could hinder students’ understanding of lecture content delivered online or negatively affects discussion flow during teaching and learning activities. To address these problems, the STR technology was applied. That is, text streams synchronously transcribed from speech input by Speech-to-Text Recognition (STR) technology were provided for students to read content of lectures and learning activities during and after their classes.

The STR technology was applied in an effort to improve learning performance and communication in an online synchronous cyber classroom environment. Two experiments were carried out to investigate the effectiveness of applying STR technology on learning performance and students’ perceptions and behavioral intentions toward the STR. In the first experiment the STR technology was applied for one-way lectures and in the second experiment the STR technology was applied for students’ individual oral presentations and group discussions. Statistical results of the first experiment showed moderate improvement in the performance of the experimental group (the treatment group who study with the STR) over the control group (the no-treatment group who study without the STR) on two sessions of writing essays. However, once students in the experimental group became familiar with the STR-technology and used it as the learning tool, they significantly outperformed the control group students in post-test results. Statistical results of the second experiment revealed that the experimental group performed significantly better compared to the control group in two sessions of writing essays, intermediate test, and post-test. These results suggest that the STR technology was beneficial for students’ learning in an online synchronous cyber classroom environment so as to improve their overall learning performance.

Interviews with students of both experiments revealed that students could take advantage of STR-generated texts during and after teaching and learning activities. Students emphasized that they could read the STR-generated texts and listen to a speaker simultaneously to enhance their comprehension. In addition, students used the STR-generated text during online teaching and learning activities to make up missed information, clarify, and enhance their understanding of content of a speech in an online synchronous learning environment. Furthermore, students mentioned that STR-generated texts were useful in simultaneous note-taking; students took notes and reviewed them later to get a deeper understanding of content of a speech. Some students also mentioned that after online teaching and learning activities they preferred to study STR-texts to make up the classes they missed, while some students studied texts to recall and get a better understanding of content of teaching and learning activities.

Finally, the survey results of both experiments showed that most experimental students perceived that the STR technology was easy to use and useful for learning. Most students of both experiments also expressed that they were highly motivated to use the STR technology as the learning tool in the future.

Based on the results, we recommend that instructors and students apply the STR technology in an online synchronous cyber classroom and students take advantage of STR-generated text during and after teaching and learning activities to enhance their understanding of learning content. Educators need to design the STR technology-based teaching and learning activities in a way that encourage students to find its strengths and limitations and then fully utilize the STR-generated texts for learning. It is recommended to train the STR technology prior to its application to obtain a reasonable technological accuracy rate of more than < 85 percent.

Some new research directions for future studies were also proposed. One direction is to investigate the pedagogical potential of the STR technology application for other learning environments (e.g. traditional or virtual classroom). Another direction is to explore the extension of the STR technology with similar innovations (e.g. Text to Speech Recognition) in order to enhance learning.

As a final note, I would encourage young researchers use creativity in their research. Creativity is important in research as we need to find solutions to a research problem that are different from those proposed by other scholars. Therefore, try to identify an important research issue and try to address it in creative and unique way.

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Rustam Shadiev, School of Education Science, Nanjing Normal University, China (e-mail: rustamsh@gmail.com).
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Dr. Rustam Shadiev is a professor in the School of Education Science, Nanjing Normal University (China) and a distinguished professor of Jiangsu province (China). He is also a Fellow of the British Computer Society (BCS) and a Senior Member of the Institute of Electrical and Electronics Engineer (IEEE). Rustam Shadiev was selected as the Most Cited Chinese Researchers in the field of Education by the Elsevier in 2020 and 2021. His research interest includes advanced learning technologies to support language learning and cross-cultural education.