A VR Classroom with Digital Media for Foreign Language Teacher Training

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Abstract: We report extensions to a VR Classroom to provide trainee foreign language teachers with an opportunity to practice giving corrective feedback in the context of a digital media classroom. We propose further extensions to the classroom to give teachers feedback on speech clarity, which is critical for good communication and thus for effective learning in the classroom.

Keywords: Virtual Reality, Foreign Language Teaching, Phonetics, Clear Speech

1 Background and Motivation

The VR Classroom was built as a training platform for trainee teachers to gain experience in replicable scenarios in order to developing classroom management skills and learn to handle disruptions [Wi19]. The VR Classroom promotes teacher training without the administrative effort involved in organizing school placements. Trainee teachers also have the opportunity to correct and improve their technique, given that VR scenarios can be repeated identically, in contrast to real classroom scenarios. Various classroom seating plans are available, along with a chemistry laboratory and computer rooms. While the trainee teacher wears a HMD and interacts with the classroom via controllers, a coach initiates and adjusts virtual students' behaviour (see GitUP wiki[4]).

2 Extensions for Digital Media and Foreign Language Teaching

Further extensions to the VR Classroom, supported by the Stiftung Innovation in der Hochschullehre, are under way in the context of foreign language teaching and digital media. New scenes with an interactive smartboard have been developed to reflect modern schools. Thus presentations/videos can be played and a pen allows written input.

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With regard to foreign languages, new lesson materials have been developed to provide trainee teachers of foreign languages a chance to practice giving feedback to students. The virtual students (VSs) are called on to given their answers to a listening comprehension task. The training session begins at a point in time immediately after completion of this task. On the basis of established findings on corrective feedback [LR97], the coach controls the VSs' uptake of or confusion with the feedback.

3 Planned extensions to measure clear speech

Oral feedback is of great importance for students as teachers are their primary language models, so their speech must be clear. Clear speech is an element of teacher language use, reflected by lower speed, higher volume and exaggerated articulation [SB09]. Clear speech reduces ambiguity, ensuring students have adequate input for learning.

We plan to extend the VR Classroom with additional components for the evaluation of clear speech. Speaking volume (sound intensity) can be extracted directly via the head-mounted display's built-in microphone. The sound-to-noise ratio in a given scenario can be obtained from the intensity of this signal and that of the schoolhouse background noise recordings of the VR Classroom. To measure speaking rate, an automatic speech recognition algorithm must first be applied to extract text. We propose to use OpenAI's open source Whisper model, which is reported to provide performance close to that of human transcribers [Ra22]. Word counts from the resulting transcript can then be extracted to provide users with an average speech rate in phonemes per second or words per minute. These metrics may be made available in real time on a floating panel in the immersants' field of view, depending on computational performance, thus providing trainee teachers with immediate feedback to adjust their speech.

The availability of the trainee teacher's speech signal and a transcript of their speech opens up many other options for measuring aspects of teacher talk at a higher level.

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