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論文内容の要旨

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A Mechanism to Create a Delighted Student with Enhancing the Effectiveness of the Virtual Learning and Investigate the Behavior of Non-verbal Communication

(学生の満足度に付随したヴァーチャルラーニングにおける有効性向上の創造と非言語的行動についての調査)

Student satisfaction plays an important role in determining the success of e-Learning since the dropout rate is very high comparing to the conventional learning. Thus the objective of this research is to create delighted e-Learner with establishing effective and efficient learning atmosphere for the education while enhancing the usefulness of the virtual learning by using ICT (Information and Communications Technology). Building a balanced and meaningful interactivity among the learning elements is the way to creating delighted e-Learner with enhancing the learning efficiency. Three approaches with the multi-model system are considered in this research to establish a wealthy interaction among the elements of the virtual learning.

The first approach is to establish an effective communication among the participants of the virtual class to establish a proper interaction among the student-teacher and them-selves. Non-verbal communication owns a highest portion of the communication process and facial expression, eye blink, head pose are vital for the education. Thus the facial expression, eye blink and head pose of the student are visualized in the virtual learning environment through an avatar who represent the student in the virtual environment.

The second approach is the establishment of proper interaction between the student and the content with the support of teacher. The student tracking system including their status was constructed to obtain the feedback of the students to modify the content.

The third approach is to establish a proper interaction between the student and the environment with involving the teacher. Thus, the identification of the effective factors and the development a matrix including the effective factors based on the student characteristics were carried into effect in this study to provide the preferred environment for the student.

The results of the experiments which are conducted with the non-verbal visualization system indicate that the students prefer to engage with the virtual class activities with the visualization system and it is highly affected to the discussion. In addition, the student performances were enhanced with the non-verbal visualization system by 12.5%. The analysis of the eye blink was indicated that there is a relation between the teacher and the student through their eye blink. Further the behavior of the eye blink indicated that the most of the eye blink happens at the

breakpoint of speaking. The analysis of the eye blink rate was indicated that, it was depended on the internal state of the persons and it was based on the activity that he/she performed with the environmental factors.

Then the evaluation the affection of these three approaches was done with the web-based Likert-scale questionnaire with 78 subjects. They preferred to engage in the virtual learning with visualization their non-verbal features and the interaction between the teacher and the student was raised through the non-verbal visualization system. The tracking system is vital component of the virtual class education since it raises the link between the teacher and the students. The identification of the effective factors and development of the matrix including the effective factors is evaluated using the same subjects. The effectiveness of the virtual class can be enhanced and raised the satisfactory level of the student with the identification of the effective factors through providing a preferred environment of the students.

The overall results of the responses indicate that the multi-model system including the three approaches were contributed to enhance the effectiveness of the virtual class while enhancing the satisfactory level of the students through a proper interaction among the learning elements.