

An Approach and A System for Monitoring Online Tests

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Abstract: - We present an approach and a system to let tutors monitor several important aspects related to online tests, such as learner behavior and test quality. The approach includes the logging of important data related to learner interaction with the system during the execution of online tests and exploits data visualization to highlight information useful to let tutors review and improve the whole assessment process. We have focused on the discovery of behavioral patterns of learners and conceptual relationships among test items. Furthermore, we have led several experiments in our faculty in order to assess the whole approach. In particular, by analyzing the data visualization charts, we have detected several previously unknown test strategies used by the learners. Last, we have detected several correlations among questions, which gave us useful feedbacks on the test quality.

Key Words: —Online Test, Learner, Faculty, Assessment.

I. INTRODUCTION

E-TESTING systems are widely adopted in academic environments, as well as in combination with other assessment means, providing tutors with powerful tools to submit different types of tests in order to assess learners' knowledge. Among these, multiple-choice tests are extremely popular, since they can be automatically corrected. However, many learners do not welcome this type of test, because often, it does not let them properly express their capacity, due to the characteristics of multiple-choice questions of being "closed-ended." Even many examiners doubt about the real effectiveness of structured tests in assessing learners' knowledge, and they wonder whether learners are more conditioned by the question type than by its actual difficulty.

In order to teach learners how to improve their performances on structured tests, in the past, several experiments have been carried out to track learners' behavior during tests by using the think-out-loud method: learners were informed of the experiment and had to speak during the test to explain what they were thinking, while an operator was storing their words using a tape recorder.

This technique might be quite invasive, since it requires learners to modify their behavior in order to record the information to analyze, which might vanish the experiment goals, since it adds considerable noise in the tracked data. Nevertheless, having the possibility of collecting data about learners' behavior during tests would be an extremely valuable achievement, since it would let tutors exploit many currently available data exploration and knowledge discovery (KDD) strategies to elicit important insights on the testing activities that can be used to teach learners how to improve their performances. However, it would be desirable to devise noninvasive data collection strategies that do not influence learners' behavior during tests, so as to convey more faithful feedbacks on the testing activities.

In this paper we present a solution enabling the recording of learners' habits during on-line tests without informing them of the underlying experiment, and consequently, without asking them to modify their behaviour, which potentially yields more realistic results. In this paper we present a solution enabling the recording of learners' habits during on-line tests without informing them of the underlying experiment, and consequently, without asking them to modify their behaviour, which potentially yields more realistic results. In this paper we propose a data exploration approach exploiting information visualization in order to involve tutors in a visual data mining process aiming to detect structures, patterns and relations between data, which can potentially reveal previously unknown knowledge inherent tests, such as the test strategies used by the learners, correlations among different questions, and many other aspects, including their impact on the final score. In this

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II. TECHNIQUES AND ALGORITHM

In this project, we propose a data exploration approach exploiting information visualization in order to involve tutors in a visual data mining process aiming to detect structures, patterns, and relations between data, which can potentially reveal previously unknown knowledge inherent in tests, such as the test strategies used by the learners, correlations among different questions, and many other aspects, including their impact on the final score.

We also present a system implementing the proposed approach. The system logs all the interactions of learners with the e-testing system interface. In particular, it captures the occurrence of question browsing and answering events by the learners and uses these data to visualize charts containing a chronological review of tests. Other than identifying the most frequently employed strategies, the tutor can determine their effectiveness by correlating their use with the final test scores.

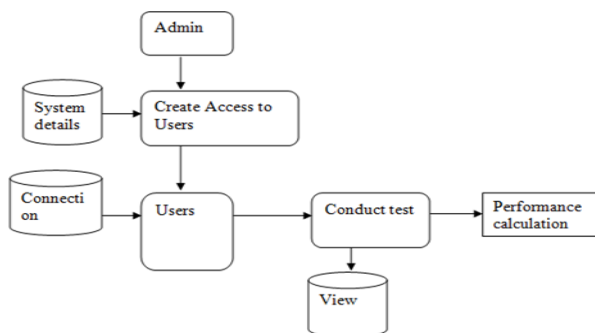


Fig.1. System Architecture

III. CONCLUSION

This project presents an approach and a system to let tutors monitor learners' strategies during online tests. The approach exploits data visualization to draw the data characterizing the learner's test strategy, in order to trigger the tutor's attention and to let him/her discover previously unknown behavioral patterns of the learners and conceptual relationships among test items. In this way, the tutor is provided with a powerful tool that lets him/her review the whole assessment process and evaluate possible improvements.

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