The Impact of using Rubric in e-portfolio Assessment on student Learning and Attitude towards Test

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Abstract

Aims: this study (Research Article) aimed to investigate the effect of "rubric" as a measure of learning products and process on the health student knowledge and attitude performance. Methods: this study is a semi-experimental design, pre-test- posttest with control group. A statistical population are khalkhal medical college undergraduate that have chosen computer lessons in 91-90 second semester. Study samples included the two classroom computers in the health disciplines who were randomly assigned to two groups (20 students) and control (20 students). Learning test designed by the researcher (reliability 0.75) and attitude toward test questionnaire (reliability 0.70) was used to collect data. It also to analyzes the methods of descriptive statistics (FREQUENCY, MEAN and SD) and was used to evaluate the research hypotheses, T-TEST, MANOVA. Results: the findings indicated that learning and attitude scores of students in the experimental group was significantly increased compared with control group p <0.05, f2, 35 = 43.98 Conclusion: The results derived from this study indicated that students who had been trained by "rubric" had better learn. Interviews and field observations have been attributed mainly due to the tangibility of the rubric assignments, transparent evaluation criteria and the rubric guidelines role.

Keywords: assessment, assessment of learning, performance assessment, rubric, portfolio.

Introduction

Emersion Of new hypotheses in field of learning such as cognivitism, constructionism and connectivism and also restrictions and criticisms of multiple-choice tests has spread the alternative assessment methods. Authentic or alternative assessment is a comprehensive expression, covering different methods of assessment including performance based assessments, Observational assessment, Self-assessment, Peer assessment and E-portfolio assessment. E-portfolio-based learning is one of the performance assessment methods which has gained so much reputation recently[1-2]. According to Bartlett[3], using E-portfolio will enable users to collect and organize their creations in different formats (sound, video, image and text). Unlike paper based portfolio, E-portfolio will enable users to save their information with no time and place limit and users are also able to reach them in any moment. In term of explanation, portfolio is a series of learning activities which portrays the endeavor, progress and educational success of student in a specific field[4-5]. In E-portfolio learners will upload some samples of their homework and activities which they have performed in a definite period such as a term, semester or year, on web, network or computer and deliver it to a mentor to evaluate it, the mentor will evaluate them based on specific standards. One of the best standards, which is prepared and delivered to mentor and student, is rubric. In fact, rubric is a grading standard for performance assessment methods which is used for explaining the traits of qualitative homework. They also create chances for learner to understand the

expectations about assessment and homework. Rubrics prepare the performance domain through creation of classifications. This classification, defines the domain of possible outcomes from basic performance to superior performance. Conrad and Donaldson[6] explain the Rubric as: "a tool which explains the performance levels of each gradable activity element". Rubrics prepare a noticeable method for learners to evaluate their performance along with performance assessment of team members. Rubrics offer a proper design which helps the mentor to answer the implied or direct questions of students such as: "how is my performance?" Using rubrics will omit the estimation from grading process. In addition, rubrics not only present a real picture of learner's relation with educational material and classmates but also prevent the score inflation, dissatisfaction and complaints about scores by preparing factual and measurable assessments. Rubric can be used by most of homework and it can help students to realize the meaning of high quality activity. Rubric can help students to control the learning process and have a complex understanding of educational material[7-8].

Hellmann and Allison[9] based on his experiences declares: this is the problem in most of performance educations which students apparently enjoy performance learning but they are not interested in doing homework or preparing reports and find it so difficult. Hellmann finds the main reason of this problem in lack of evaluation standards or specific scoring guideline, in other words, most of the students don't know what is expected from them in doing homework and how they should prepare the homework to

get the best score. He suggested rubric as a solution to this problem and in a research he analyzed the effect of rubric usage on laboratory report performance of biology students. Results of this research showed, using rubric has a positive effect on student's performance. He observed, the average of received reports in first base line was increased from 53% to 73% at first intervention stage and again to 78% at second intervention stage, the quality level of report were also improved. In another research, Gerken and Elaine[10] analyzed the effect of rubric on educational development of students in field of writing. In this research, it was asked from ten students to do a specific writing homework in qualitative method, the results showed a noticeable increase in the educational development scores for half of the students and the other half had no increase, but their scores were not less than before. Therefore, using rubric is effective in improvement of writing scores of language students. In a study, researchers realized that teaching the scoring method for personal activities by use of rubric will result in better understanding of educational objectives by high school students. They also observed a high correlation between teachers' rubric scoring system and student's rubric (r =0.90 to 0.94). Also in a research by Gaytan and Mcewan[11], they concluded that professors and learners will regard rubric function as an assessment tool and also a tool which presents fast and meaningful feedback. Generally, rubric studies in higher education are performed in a vast domain of fields and different aims such as developing the educational progress of student, improving the education and evaluation of plans. While the students attitude toward rubric is generally positive and some of authors has received positive response from teachers in use of rubric, but some research report teachers' resistance in use of rubric [12]. So, in order to ensure the effectiveness of rubric in portfolio analysis, in this research we analyzed the effect of rubric usage in E-portfolio evaluation on knowledge-based and skill-based performance of hygiene students. Results of this research can serve as a proper evidence for using rubric in higher education level.

Methodology

The present research in case of data gathering is considered as semi-experimental, with pretest-posttest design and control group. The statistical population is consisted of Khalkhal medical college students in BS level who chose computer course in second semester of (2011-2012) educational year. Research samples include two computer course classes in the

hygiene field who were randomly assigned into two groups of test group (20 students) and control group (20 students). In order to gather required data we used researcher-oriented learning test and attitude assessment questionnaire of Ezatolah Ghadami. Validity of the tools was confirmed by some professors and experts. The reliability for learning test was measured by split-half method (0.75) and reliability of attitude-toward-test assessment questionnaire was measured by Cronbach's alfa method (0.70).

In this research, at first a pretest was done from two classes (test group and control group) then rubric was presented to test group in four consecutive sessions. In this period the control group continued the old educational method. At the end a posttest was performed from both groups. For analyzing the results we used descriptive statistics (frequency, mean, standard deviation) and in order to analyze the research hypotheses we used T test and MANOVA. The statistical software we used in this research was SPSS 16.

Research hypotheses: Students who are assessed by rubric have more amount of learning in comparison to students who are assessed by old assessment methods. Students who are assessed by rubric have more positive attitude toward test in comparison to students who are assessed by old assessment methods.

Results and Discussion

In order to compare the scores of test group and control group in pretest stage and determining whether groups in pretest are similar or not, we use T test for independence groups (table-1).

Table-1 shows that there is no meaningful difference between pretest score meanes in all variables of control and test group ($p < 0.05$). But even this trivial difference between two groups in pretest should be omitted or adjusted so we can conclude that the improvement of scores is a result of assessment type. For this reason, in research hypothesis analysis we use the difference of pretest and posttest scores (D scores) to omit and control the effect of pretest. in order to realize whether the assessment method (rubric assessment or old methods of assessment) are effective on learning variables and attitude or not, we surveyed the Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root methods and reported the Wilks' Lambda statistics (because the independence variable in this research has two levels and as a result the amount of F in all tests is the same so we reported only one of them).

Table-1
Summary of information related to T test in order to compare the test group and control group mean in research variables of pretest stage

Variable	Control group	Intervening group	Independent T test result	
	MEAN and SD	MEAN and SD	t	P
Learning	7.45±1.60	7.25±1.99	0.34	0.72
Attitude	104.05±6.30	105.65±6.25	0.80	0.42

Based on above table we can say the Wilks' Lambda is meaningful (p<0.05 F2, 35=43/98). The presented data in this table shows that we can reject the hypothesis of similarity in averages of two groups based on dependent variables (learning, attitude toward test). In statistical view, there is a meaningful difference between two groups of rubric assessment and old assessment method in dependent variables. In other words, there is a meaningful difference between two groups of rubric assessment and old assessment methods in scores of variables such as learning and attitude toward test. Table-2 presents a general view of all variables analysis but for more information, data related to pair comparisons in each dependent variable is presented in tables-3 and 4.

In table-3 the results of inter-group effects variance analysis of variable scores of learning with omitting the pretest effect, are presented. In order to analyze the pair comparisons we consider intervening effects. When we consider the results of dependent variables separately, in all variables the differences reached the statistical meaningfulness by use of Bonferroni balanced alpha level. Based on results of null hypothesis table we result from all variables that there is a meaningful difference between the averages of two groups of rubric assessment and old assessment methods which this difference is toward test group. It means, the students which are assessed by rubric have better scores in comparison to students who were assessed by old assessment methods. In other words, the research hypothesis is supported.

Table-4, presents the test results of inter-group effects variance analysis of "learning" variable after omitting the effect of pretest. In order to analyze the pair comparisons we consider the intervening effects. When the results of dependent variables are regarded separately, the differences in all variables by use of Bonferroni balanced alpha level (p<0.05) has reached the

statistical meaningfulness. Based on results of table, null hypothesis is rejected in all variables and we conclude there is a meaningful difference between the averages of two groups of rubric assessment and old assessment methods which this difference is toward test group. It means students who were assessed by rubric had better scores in comparison to students who were assessed by old assessment methods and received no test intervention. In other words research hypothesis is approved.

Discussion: Rubric is a grading standard for performance assessment methods which helps learners to understand the expectations about assessment and homework. Using rubrics will omit the estimation from grading process. In addition, rubrics not only present a real picture of learner's relation with educational material and classmates but also prevent the score inflation, dissatisfaction and complaints about scores by preparing factual and measurable assessments. In this research we analyzed the effect of rubric usage in E-portfolio assessment, on attitude and knowledge-based performance of hygiene students. Results showed that there is a meaningful difference between the averages of two groups of rubric assessment and old assessment methods which this difference is toward test group. It means students who were assessed by rubric had better scores and more positive attitude in comparison to students who were assessed by old assessment methods and received no test intervention. In other words, using rubric in E-portfolio evaluation can has an important role in improvement of effectiveness of this performance assessment tool. Results of this research are in accordance with results of researches of Sigel et al[7], Hellmann[9], Gerken[10], Sadler and good [13] and Gaytan and Mcewan[11] Clark and Sigel [7] showed that Rubric can help students to control the learning process and have a complex understanding of educational material.

Table-2
Multi-variable analysis on learning and attitude test scores by considering the groups as independent variable

Variable	Test	Value	F	Hypotheses Df	Error Df	P
Group	Wilks' Lambda	0.28	43.98	2	35	0.0001

Table-3
Results of the test on inter-group effects variance analysis of scores of "learning" variable in rubric assessment group and old assessment method group after omitting the effect of pretest

Change sources	Sum of squares	Degree of freedom	F	Level of meaningfulness	Size of effect	Test power
Learning	171.68	1	72	0.0001	0.66	1
error	85.83	36	-	-	-	-
Total	261.60	39	-	-	-	-

Table-4
Results of the test on inter-group effects variance analysis of "attitude toward test" variable in rubric assessment group and old assessment method group after omitting the effect of pretest

Change sources	Sum of squares	Degree of freedom	F	Level of meaningfulness	Size of effect	Test power
attitude	1213.49	1	19.74	0.0001	0.35	0.99
error	5086	36	-	-	-	-
total	3519.37	39	-	-	-	-

In fact, rubric determines a framework for students' activities through determining evaluation standards which are derived from educational standards rubric also prepares a suitable ground for students so they can self-control their activities. Hellmann's[9] research proves the positive effect of rubric on students' performance. Gerken's[10] research showed that using rubric is so effective in improvement of student's scores. Gaytan and Mcewan[11] confirm that professors and learners pay so much attention to rubric usage as a tool for assessment and supplying quick and meaningful feedback.

Generally, rubric studies in higher education are performed in a vast domain of fields and different aims such as developing the educational progress of student, improving the education and evaluation of plans. While the students attitude toward rubric is generally positive and some of authors has received positive response from teachers in use of rubric, but some research report teachers' resistance in use of rubric[12]. For explaining these results we can say use of rubric will make the homework more tangible and will clarify the evaluation standards and serves as a general guideline for doing homework. Therefore, it will result in improvement of evaluation process and enhances the students' attitude toward test.

Conclusion

Results of this research showed that using rubric in E-portfolio evaluation can increase students' learning and improve their attitude toward test. Therefore, we suggest professors and mentors to design a rubric and deliver it to students along with homework. In this case learners can have a proper inference of homework and also assessment can be done with a standard scale.

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