

# FACTOR STRUCTURE AND PSYCHOMETRIC PROPERTIES OF THE INDEX OF ETHICS IN EDUCATIONAL ASSESSMENTS PROCESS OF COLLEGE STUDENTS

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## Abstract

One of the main topics in the realm of assessment which has received considerable attention on part of researchers is the notion of Morality in educational assessments. The purpose of this study was to develop and test a construct to assess Evaluation Morality in an exploratory way to achieve the constructive dimensions and items of the scale. In order to achieve this goal, the Mixed-Methods Sequential Explanatory Design for developing and testing a new instrument was used. The research was continuously conducted in qualitative and quantitative sections. Therefore, grounded theory strategies, in qualitative section, including open, axial and selective coding were used in order to achieve a model derived from the research. After Evaluation Morality components and codification of its items were identified, the validity of the questionnaire was examined by Content-Related Validity, Exploratory Factor Analysis and Convergent Validity. The reliability of the questionnaire was investigated through Cronbach's alpha (0.90). Thereupon, findings showed that the validity and reliability of Evaluation Morality Questionnaire (EMQ) were verified. This finding fit to theoretical base in academic fields. It can be concluded that this questionnaire can be used in experimental and survey research in the field of metacognition and research.

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**Keywords:** Ethics, assessment, scale development.

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## Introduction

Assessment is one of the main aspects of the educational process and a main component of syllabus, teaching method and learning (Estaji, 2011, JCSEE, 2003, Allen, 2004). Assessment is broadly defined as the process of collecting, interpreting, and reporting information for the purposes of providing feedback to students, and where applicable, to their parents/guardians, about their progress toward attaining the knowledge, skills, and attitudes to be learned, and informing educational decisions (i.e., instruction, promotion, graduation, diagnosis admissions, placement) to be made with reference to students (Pettifor, Saklofske, 2011). Assessment can focus on the individual learner, the learning community (class, workshop, or other organized group of learners), a course, an academic program, the institution, or the educational system as a whole (Nelson, R, Dawson, Ph, 2014). One of the main topics in the realm of assessment which has received considerable attention on part of researchers is the notion of ethics in educational assessments (Estaji, 2011, Elwood, 2013). Classroom assessment is not only a ubiquitous practice pervading all levels of schooling, but it is also a practice fraught with ethical issues (Poup, 2006, Cited in Beets, 2011). In its essence, assessment necessitates observing ethical issues (Mathison, 2011). Ethical principles are a set of instructions which provide guidelines for activities that are performed in complex ethical situations and also prevent the occurrence of major problems (Forsyth & Boyle, 2011). Ethical issues are related to the main conclusions drawn from interpreting the assessment results and the potential consequences of using the results, especially issues such as discrimination, equity and fairness (Elwood, 2013). As a major principle in assessment, ethics leads the practices and choices of the assessor throughout the assessment process. Observing the principles of fair assessment throughout all the stages of the test including the design, preparation of students, implementation and reporting the results is considered to be essential (Sa Couto, 2003). In addition to observing the quantitative and qualitative standards for designing the questions, ethical principles must also be taken into consideration for an assessment to be suitable (Hejazi, Barzegar & Hedayati, 2014). Ethical standards guarantee that the assessment is legal, ethical and completely to the benefit of students and others who are affected by the results. Some of the prerequisites of ethical standards are the understanding of the assessor and his/her compliance with the existing regulations, observing the rights of students and parents, secrecy, having access to important information and observing humanistic issues. More specifically, these standards include providing service to the students, adopting appropriate policies and approaches, access of students to the assessment information, appropriate behavior with the students, observing the rights of students, equal assessment and preventing conflicts of interest (Gullickson, 2003, Translated into Persian by Jalali, 2010). Apart from assessing the students' degree of learning, appropriate and ethical assessment is itself considered as one of the main stages of the learning process (Hejazi, Barzegar & Hedayati, 2014). Non-observation of ethical issues in assessment reduces the motivation of students as well as their efforts for learning and studying, lessens the effectiveness of the education and learning process, reduces the perceived psychological security of the students and leads to invalid results (Beets, 2011). In recent decades, ethical issues in assessment have become the center of attention in educational studies (JCSEE, 2003). Some texts discuss ethical principles that can guide ethical judgments related to assessment. For instance, Airasian (2005) suggests that the ethical standards for assessment refer to "some aspect of a teacher's fairness in dealing with his or her pupils (p. 20)." Similarly, Taylor and Nolen (2005) point out that since poor assessment can significantly affect the performance and motivation levels of students, educators are first and foremost responsible not to do any harm to the students. "The ethical responsibility of educators is 'first, Do No Harm' (p. 7)." Peterson (2005) found that undertaking assessment without considering the composition of the classroom and the learning style of students is an unethical practice. With regard to the Iranian context, Hejazi, Barzegar and Hedayati (2014) found that the ethical necessities for evaluating the educational improvement of students include providing the ground for participation and involvement of students in course concepts, designing suitable questions with regard to the cognitive, emotional, psychological and kinesthetic aspects, clear designing of questions in order to reduce respondent errors, not designing any questions from untaught sections, designing the questions proportionate to the standard difficulty and discrimination coefficients, designing the multiple choice questions based on Milman's index, ensuring the comprehensiveness of the questions, providing the opportunity for students to compensate for their undesirable grades by using the genetic assessment method, behaving low-grade students in a humanistic manner, and putting emphasis on academic aspects in designing the questions. In the same vein, Matlabifard, Nave Ebrahim and Mohsenzadeh (2011) concluded that the ethical principles related to appropriate assessment are as follows: assessment based on the previously presented materials, paying attention to the psychological dimensions of assessment and lack of prior orientation. Despite the above mentioned studies, there is still lack of agreement as to the components of ethical issues in assessment. Indeed, considerable disagreement even appears to surround such basic questions as: What constitutes an ethical issue in evaluation? For example, when attempting to summarize their research on evaluation ethics, Newman and Brown (1996) state that "We consistently found people whose generalized response was 'What? Ethics? What does ethics have to do with evaluation?' This came from experienced evaluators, long-term users of evaluation, evaluation interns, and faculty members teaching program evaluation" (p. 89) (Cited in Morris, 2000). Similarly, Morris and Cohn (1993) found that 35% of their sample consisting of members of the American Evaluation Association (AEA) responded "no" when asked in a questionnaire, "In your work as a program evaluator, have you ever encountered an ethical problem or conflict to which you had to respond?". Therefore, the realm of ethics in assessment is considered to be a challenging field of investigation. Despite the fact that assessment is a major function of educational systems, there are many weaknesses in the current procedures. Brown, Ball and Pendlebury (1997) have pointed to the weak points of assessing the academic performance of university students, some of the most important of which are inappropriate behavior with

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students, significant differences in the grading of colleagues, consideration of vague and previously unknown criteria in assessment, and unfamiliarity of students with the academic expectations which they must fulfil. Abdoli (2008) aimed at a pathology of the current approaches to teaching and learning. He found that students allocate most of the problems to the methods of assessment, while they consider teaching methods as the least problematic aspect. In a web-based investigation of teachers, Green *et al.* (2007) found that creating more solidarity in the methods of ethical assessment among teachers and the public seems to be necessary. In general, the existing literature suggests that observing the ethics of assessment has a major role in enhancing the validity of the assessment, improving the process of education and increasing the efforts of university students to reach higher academic achievements.

Also, previous studies point that university professors have many ethical weaknesses in assessing their students. Therefore, due to the importance of valid, informed and impartial assessment, the existence of weaknesses with regard to observing ethical principles in assessments, and lack of a suitable instrument for assessing this index, the current study aimed to extract the components and indices of the ethics of assessment by investigating the texts on the ethical standards and principles of assessment.

### *Method*

The purpose of this study was to develop and test a construct to assess Evaluation ethics in an exploratory way to achieve the constructive dimensions and items of the scale. In order to achieve this goal, the Mixed-Methods Sequential Explanatory Design for developing and testing a new instrument was used. Within an iterative process, the Evaluation Ethical construct and the indicators for each dimension were developed. Initial behavioral indices were first developed utilizing the interviews with specialists, examining the literature and considering the resources. Final indices were arrived at by consensus after deliberate discussions on the initial coding process.

### *Participants*

Data from 500 participants were collected initially but reduced to 466 due to missing data. The participants were undergraduate students and recruited from Farhangian University of Mashhad in Iran.

The mean age for participants in the study was 21.46 years with a standard deviation of 1.19 years. All of them were females. All samples answered Teaching Professional Ethics Questionnaire TPEQ which was validated by Sobhaninejad, Najafi, Jafari & Farahani (2014) And Evaluation Ethics Questionnaire (EMQ) which was going to be developed and validated by authors.

### *Procedure*

#### *The first stage*

The initial form of TPEQ included 58 items had been compiled. Some items which had high overlap, were omitted and some items changed for better understanding after examining it by research team, and finally a questionnaire consisted of 46 items was given to the specialists in order to be entered the second phase of the study include examining the content-related validity.

#### *The second stage*

In this stage, the TPEQ were given to ten specialists. The indices related to the content-related validity including Content Validity Ratio (CVR) and Content Validity Index (CVI) were evaluated. Also, some items changed based on the specialists' comments. According to Lavshi table (1975), the minimum of CVR for judging 10 individuals is 0.62 and the common amount for CVI index is 0.80. Based on it, 7 items that their CVR index was lower than 0.62 and their CVI index was lower than 0.80, were omitted.

#### *The third stage*

At the stage of pilot study, the modified TPEQ was implemented on 34 undergraduate students who were selected by available sampling method. The aim of doing this pilot investigates was identifying the items with low correlation with the score of the sum of the items and re-examining them and modifying them.

The criteria of selecting inappropriate items, in this stage, were cutting correlation value of the score of the phrase with the scale at the value of 0.3. Reliability for the whole test was 0.86 using Chronbach's alpha. During pilot implementation, the students were asked to give their opinions about the clarity of the items.

#### *The fourth stage*

The TPEQ was implemented on 466 undergraduate students who were selected using quota sampling method (based on the field). In this stage and as the final stage, the Construct Validity of the TPEQ was examined using exploratory factor analysis, convergent validity. And its reliability was calculated by Cronbach's alpha.

### *Data analysis and results*

To investigate the question how is the factor structure of TPEQ in population of undergraduate students? Exploratory factor analysis was conducted. In this study, Kaiser-Meyer-Olkin of Sampling Adequacy (KMO) is 0.90 which shows adequacy of the sampling. Also, significance of Bartlett's test ( $\chi^2_{741}=7694/107$ ,  $p<0.001$ ) indicates that data correlation matrix is appropriate for factor analysis, so factor analysis based on studied correlation matrix is justifiable. To explore the distinction between components, an exploratory factor analysis was conducted with six factors using a Varimax (orthogonal) rotation. The items were subjected to the component that had weight of 0.3 or higher. Totally, 5 factors had initial Eigenvalues of higher than 1 that include: 8.85, 5.01, 2.25,

1.81 and 1.51. These 5 factors explain the 49.77 percent of the variance (see table 1). Five items (items 4, 6, 12, 19, and 34) were deleted at this stage because they did not load strongly ( $<0.30$ ) on a single factor but on several factors at the same time or because they saturated on no factor. Moreover, the analysis of internal consistency of factors derived from this first component analysis revealed that 1 items should be deleted because of poor Cronbach a coefficients (item 18).

**Table 1:** Special value and explained variance percent

	initial Eigenvalues			Rotation sums of Squared Loading		
	Total	Variance percent	Concentration percent	Total	Variance percent	Concentration percent
1 <sup>st</sup> component	7.931	24.785	24.785	4.639	14.498	14.498
2 <sup>nd</sup> component	4.289	13.402	38.188	4.110	12.845	27.343
3 <sup>rd</sup> component	2.039	6.373	44.560	3.934	12.295	39.638
4 <sup>th</sup> component	1.599	4.995	49.556	2.705	8.453	48.091
5 <sup>th</sup> component	1.343	4.196	53.752	1.811	5.661	53.752

**Table 2:** Five factor results: rotated component matrix.

Items	component				
	1	2	3	4	5
26 At the beginning of the semester, instructor informs the students about the importance and benefits of evaluation.	.688				
29 Exam questions are designed according to course content presented in class.	.645				
28 If I have an objection to test scores, instructor gently answers to all protesting questions.	.637				
25 Instructor gives scores to students according to their abilities.	.610				
30 Instructor has high precision in the correction of examination papers.	.604				
23 Instructor calms the students before the test.	.578				
22 Instructor provides a quiet and disciplined environment during the test.	.572				
31 At the beginning of the semester, instructor clearly expresses the students for their expected performance	.559				
27 Academic record of students shows scores and GPA, and their ranks.	.540				
20 The instructor performs cooperation* with any student who fails to attend the exam for justified reasons (illness, disability, maternity, etc.).	.524				
33 Instructor attends to previous knowledge of students, when formulating exam questions.	.354				
32 Instructor's evaluation assists in identifying strengths and weaknesses of students.	.351				
37 Students, who agree with the instructor's political orientation, receive a higher score in evaluation.		.915			
36 Students, who agree with the instructor's religious orientation, receive a higher score in evaluation.		.887			
38 Students, who have better appearance, receive more attention and a higher score in evaluation.		.884			
39 Students, who have a more intimate relationship with their instructor, receive better score in their final evaluation.		.848			
35 Students, who are acquaintances or children of faculty members, receive more attention and better scores.		.800			
10 10. The instructor fully explains the semester based assessment guideline to students.			.701		
11 All marks of questions are specified in exam paper.			.689		
9 Each test includes all major issues of the course.			.624		
8 The instructor attends during tests and answers students' questions.			.607		
13 At the beginning of the semester, the instructor explained that how he deals with students who have exceeded unauthorized absence.			.603		
15 The instructor explains new lesson learning objectives to students.			.579		
5 Each test includes all types of questions (easy, medium and hard).			.578		
3 In ongoing assessments, the instructor writes written comments, when correcting exam papers, to questions that are challenging for students.				.831	
2 At the request of students, the instructor presents them the corrected exam papers.				.781	
1 In ongoing assessments, after the completion of exam, the instructor reviews all questions and explains their answers.				.699	
7 Instructor applies multiple methods of assessment, such as written tests, oral tests, practical work and its operation to evaluate each student.				.309	
17 If a student gets top score, the instructor receives his permission for announcing his score.					.681
14 If I talk contrary to my instructor's desire, it affects my final score evaluation.					.535
16 Test results are announced so that my friends and classmates are not informed					.510

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Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization, Rotation converged in 3 iterations.

The Five revised factors were labeled: Rights of Students, Conflict of Interest, Appropriate Policies and Procedures, Balanced Evaluation and Service to Students, explaining 14.49%, 12.84%, 12.29%, 8.45% and 5.66% of the variance, respectively.

#### *Reliability*

The total questionnaire was found to have good internal consistency, with an  $\alpha$  coefficient of 0.90 Alpha coefficients for the Rights of Students, the Conflict of Interest, the Appropriate Policies and Procedures, the Balanced Evaluation and the Service to Students were 0.86, 0.93, 0.80., 0.71 And 0.74 respectively. After calculating Chronbach's alpha, items were analyzed and one item was detected to be deleted because of poor Cronbach a coefficients (item 18).

#### *Convergent validity*

To assess Convergent validity, the convergence of with Teaching Professional Ethics Questionnaire (TPEQ). The results demonstrated that there is a significant relationship between EMQ and TPEQ ( $r=0/58$ ,  $p<0.001$ ).

### **Conclusion**

Assessment plays a central role in teaching and learning. Indeed, an ideal assessment should give an accurate picture of the knowledge and skills of students in a specific subject area or domain. Accurate achievement data are of high importance for planning the curriculum and evaluating the success of the program. According to the sample studies presented in the introduction of this paper, the current assessment procedures have many weaknesses which reduce the efficiency of the learning process of students. Hence, it is of high significance to design an instrument for assessing the ethics of assessment.

The findings of this study led to identifying the markers and factor structure of ethics of assessment and compiling a questionnaire for that matter. The self-made questionnaire consisted of 33 Items and its reliability was found to be 86 which indicates the high reliability of the scale based on the number of factors extracted through factor analysis. Based on the results of exploratory factor analysis, the ethics of assessment questionnaire was set up according to four components including Rights of Students, Conflict of Interest, Appropriate Policies and Procedures, Balanced Evaluation and Service to Students. After determining the components of ethics in assessment, the researcher made use of content validity, exploratory factor analysis, and convergent validity in order to evaluate the validity of the questionnaire. The findings of the simultaneous implementation of the ethics in assessment questionnaire and the professional ethics in teaching questionnaire indicated that this questionnaire has an acceptable convergent construct validity. Since the recommended model is supported and the validity as well as reliability of the instrument has been approved, this scale can be used to evaluate the degree to which university professors observe ethical issues in assessing their students. The results obtained from this questionnaire may help the higher education authorities and universities to codify more informed ethical standards and regulations for ethics of assessment. Then, university professors have to be encouraged to apply the ethical components in their assessments. Observance of ethical components in assessment by teachers would increase the efficiency of the teaching-learning process and guarantee the psychological security of the students. This thinking suggests educators must work to develop practices of assessment to maximize the ethics of assessment inferences.

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