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Artículo de investigación

Test-Taker's Perception and Academic Performance in using Confidence-Weighted Number Right Elimination Testing (CWNRET) scoring method in Multiple Choice Test

Percepción y rendimiento académico de Test-Taker en el uso del método de puntuación de la prueba de eliminación correcta de números ponderados por confianza (CWNRET) en la prueba de opción múltiple

Percepção e desempenho acadêmico do test-Taker no uso do método de pontuação de teste de eliminação de número numérico com ponderação de confiança (CWNRET) no teste de múltipla escolha

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Abstract

The most common assessment tool in Higher Education and in most licensure examinations in the Philippines is the multiple-choice (MC) test. Thus, it is appropriate to device a tool on how teachers can help their students to analyze the items in an MC test better. The aim of this study is to determine the perception and test scores of the students in using Confidence-Weighted Number Right Elimination Testing (CWNRET) compared to Number Right (NR) and Number Right Elimination Testing (NRET) scoring method in answering an MC test. The researcher developed the Test-taker's Perception Inventory for the purpose of this study. Based on the results, this study showed that, generally, the perception of the students who used CWNRET is not significantly different from the perception of the students in using NRET and NR scoring methods. However, there is a significant increase in the students' perception on their need to give extra effort when CWNRET scoring method is used in answering an MC test compared to NR scoring method. Although, perceived anxiety/ trickiness is also significantly higher when CWNRET scoring method was used compared to NR scoring method. This study also showed that even if the MC tests were completed using the convention scoring method, students who have undergone CWNRET have generally higher mean score compared to students who were trained to answer other scoring methods.

Keywords: Confidence weighted multiple choice test multiple choice test scoring method

Resumen

La herramienta de evaluación más común en Educación Superior y en la mayoría de los exámenes de licenciatura en Filipinas es el examen de opción múltiple (MC). Por lo tanto, es apropiado instalar una herramienta sobre cómo los maestros pueden ayudar a sus estudiantes a analizar mejor los elementos en una prueba de MC. El objetivo de este estudio es determinar la percepción y los puntajes de las pruebas de los estudiantes al utilizar el método de puntuación de Prueba de eliminación correcta de números ponderados por confianza (CWNRET) en comparación con el método de puntuación de la Prueba de eliminación correcta de números (NRET) y en función de la respuesta correcta. El investigador desarrolló el Inventario de Percepción del examinador para los fines de este estudio. Basado en los resultados, este estudio mostró que, en general, la percepción de los estudiantes que usaron CWNRET no es significativamente diferente de la percepción de los estudiantes en el uso de los métodos de puntuación NRET y NR. Sin embargo, hay un aumento significativo en la percepción de los estudiantes sobre su necesidad de esforzarse más cuando se utiliza el método de puntuación CWNRET para responder a una prueba de MC en comparación con el método de puntuación NR. Aunque, la percepción de ansiedad / dificultad también es significativamente mayor cuando se utilizó el método de puntuación CWNRET en comparación con el método de puntuación NR. Este estudio también demostró que incluso si las pruebas de MC se completaron con el método de calificación de la convención,

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confidence level scoring method confidence weighted NRET

los estudiantes que se han sometido a CWNRET tienen una puntuación media generalmente más alta en comparación con los estudiantes que fueron capacitados para responder a otros métodos de calificación.

Palabras claves: Opción múltiple ponderada por confianza, puntuación de prueba de prueba de opción múltiple, método de puntuación del nivel de confianza del método, NRET ponderada por confianza

Resumo

A ferramenta de avaliação mais comum no ensino superior e na maioria dos exames de licenciamento nas Filipinas é o teste de múltipla escolha (MC). Assim, é apropriado criar uma ferramenta sobre como os professores podem ajudar seus alunos a analisar melhor os itens em um teste de MC. O objetivo deste estudo é determinar as pontuações de percepção e teste dos alunos no uso de Teste de Eliminação Certa de Número Ponderado por Confiança (CWNRET) em comparação com o método de pontuação Nright (NR) e Teste de Eliminação Numérica à Direita (NRET) ao responder a um teste de MC. O pesquisador desenvolveu o Perception Inventory do Test-taker para o propósito deste estudo. Com base nos resultados, este estudo mostrou que, em geral, a percepção dos alunos que utilizaram o CWNRET não é significativamente diferente da percepção dos alunos em utilizar os métodos de pontuação NRET e NR. No entanto, há um aumento significativo na percepção dos alunos sobre sua necessidade de dar um esforço extra quando o método de pontuação CWNRET é usado para responder a um teste de MC em comparação com o método de pontuação NR. Embora a ansiedade percebida / trapaça também seja significativamente maior quando o método de pontuação CWNRET foi usado em comparação com o método de pontuação NR. Este estudo também mostrou que, mesmo se os testes de MC foram concluídos usando o método de pontuação de convenção, os alunos que foram submetidos a CWNRET têm geralmente pontuação média maior em comparação com os alunos que foram treinados para responder a outros métodos de pontuação.

Palavras-chave: Pontuação múltipla de ponderação confiável, pontuação no teste de múltipla escolha, método de pontuação do nível de confiança do método, ponderação de confiança NRET

1. Introduction

Most Higher Education Institutions (HEIs) in the Philippines are giving much attention to the licensure examination performance of their graduates (Tarun, Gerardo, 2014). Almost all of these high-stake examinations like licensure examination are in a multiple-choice (MC) test format. This is because an MC test can be used to cover a broad range of topics, utilizes an efficient and reliable scoring method, adaptable to measure various learning outcomes, and flexible in choosing distractors that may provide feedback on student misconceptions (Ling et al., 2015). MC test was also perceived as less complex, clearer, fairer, and easier type of test. Students also often find multiple-choice questions less ambiguous than other format items (Tozoglu et a.l, 2004). But, MC test also has inherent disadvantages like students perceive that MC tests assess only lower-level cognitive processing like memorization (Yonker, 2011), thus they believed that preparation for MC test normally needs less time and effort (Tozoglu et al., 2004).

However, some studies have shown that it is possible for MC test to assess higher-order thinking skills and other components of deeper understanding and thinking with the use of confidence testing in answering MC test (Xu et al., 2016). With the use of confidence weighting in their answers in the MC test, the student's preparation for the MC test can also improve. In Ling et al. (2015) study, they showed the academic performance of the students as a whole is better when they used a weighted scoring method than the conventional scoring method in answering MC test.

2. Related Literatures

2.1 CWNRET scoring method

The most common scoring method used for MC test is Number Right (NR) where one point is

awarded for identifying the correct answer, and no point for an incorrect answer in each item. But, due to the nature of this scoring method, students tend to think that they need a little effort in preparing or studying for the MC test (Tozoglu et al., 2004) Thus, the researcher devised a new scoring method for answering MC test whose objective is to improve students' way of analyzing each item in the MC test, and also improves their academic performance. This is called Confidence-Weighted Number Right Elimination Testing (CWNRET) scoring method. This method combined the concepts of Number Right Elimination Testing (NRET) scoring method by Lau et al. (2011) and confidence testing. Based on the previous study, CWNRET scoring method is helpful in determining a more comprehensive level of knowledge of the students compared to NR, ET (Elimination Testing) and NRET scoring methods (Cisneros-Pahayahay et al., 2017). In using CWNRET scoring method, a student can have a maximum of the +4 points score and as low as -3-point score for each item in a four-option MC test which depends on his/her indicated confidence level in the answer. The -3-point penalty score is computed using -(k-1) formula where k is the number of options. The -3-point penalty score is given if the student is "very confident" that the correct option is incorrect, while a penalty of -(k-1) /2 for "not confident" response for identifying the correct option as incorrect.

2.2 Development of Test-taker's Perception Inventory in using MC test

Students' preparation for an assessment depends on how they perceive the assessment (before, during, and after), and these effects can have either positive or negative influences on learning (Watering et al., 2008). Scouller (1998) found that poorer performance, either on the multiple-choice questions or on the essays, was related to the use of an unsuitable study approach due to an incorrect perception of the assessment. Hence, the researcher also wanted to determine if there is a correlation between students' academic performance and their perception of the scoring method used in the MC test.

The most common instrument used to measure student's perception toward test is Zeidner's (1987) Test Attitude Inventory (TAI) which comprised 10 dimensions: perceived difficulty, complexity, clarity, interest, trickiness, fairness, value, success expectancy, the degree of anxiety evoked, and feeling at ease. In this inventory, the respondents have to answer in 5-point continuum Likert-type rating scale. For example, to measure the perceived complexity of the test, the respondent has to rate: 5=not complex at all… to 1=very complex. In Zeidner's (1987) paper, the author used this inventory to compare the students' perception and attitude toward essay and a multiple-choice test. The reported reliability is 0.85 for both essay and multiple-choice tests.

Since, TAI was not in statement form, and only utilized 5-point continuum Likert scale to describe the 10 dimensions; the researcher had to develop a perception inventory for answering MC test using CWNRET.

In the study of Tozoglu et al. (2004) study, a 30-item instrument was used which was also derived from TAI by Zeidner (1987) in order to determine the students' perceptions and attitudes towards multiple choices and essay test formats. The sample questions were as follows: "When you consider the exams you have taken, would you rate your experience with each exam format?", "When you consider each exam type, which exam format do you think is more reflective indicators of the students' knowledge?", "When you think about the essay and multiple-choice type exams, which exam type has more complicated or confusing questions?". But all these statements were also answered using 5-point continuum Likert scale which was used in Zeidner's (1987) TAI. This instrument reported a reliability coefficient of 0.83 for multiple choices test. But the researcher cannot adopt this inventory since it was made to compare the MC and essay test, and again it used a continuum Likert scale to describe each dimension.

Ling et al.'s (2015) study also determined the students' perception with the use of confidence level in answering MC test which they called "weights". But, Ling et al (2015) only used six statements with a 5-point Likert scale to determine the perception of the students. Sample questions were "Assigning relative weights to multiple choice questions was confusing.", "Assigning relative weights to multiple choice questions was beneficial to my learning.", "Assigning relative weights to multiple choice questions was beneficial to my grade.", "I prefer the traditional multiple-choice model over the one used in this course where we were to assign relative weights." and "Which of the following compositions of written questions and multiple choice questions would you feel most comfortable with?".

In the study carried out by Davies (2002), the author determined the student's perception in using the confidence-weighting scoring method in multiple-choice test through open-ended questions. Results of this study showed that students realized that MC test does not really reflect their lack of knowledge when they cannot get the correct answer. Students also believed that the new method of answering MC test "really tested their knowledge", "reduced their tendency to guess the answer", "made them cautious while answering the MC questions", and "made them think unlike the traditional method of answering MC test". Some students also stated that answering MC test with the use of confidence level is a useful learning tool and helped them get the right answer through the process of deduction. But the results also showed the inherent disadvantage of using confidence-weighting in MC test. Students reported that negative marking makes them panic or feel anxious.

So, the aim of this study is to determine the perception of the students in using CWNRET compared to NR and NRET scoring method in answering MC test. From these studies, the researcher constructed the Test-taker's Perception Inventory.

3. Instrument

Test taker's Perception Inventory

The researcher developed the Test-taker's Perception Inventory based on Zeidner's (1987)' Test Attitude Inventory (TAI), and from the studies mentioned above. The researcher constructed statements which were used to measure students' perception based on TAI's ten (10) dimensions. Each of these dimensions was measured using two to three statements. There were also some added statements to measure the Perceived Objectivity (3 items), Self-efficacy (2 items), Effort Needed (2 items), Guessing Tendency (4 items) and Risk-taking Aversion (2 items).

The initial 34-item Test-taker's Perception Inventory was pilot tested to two hundred fifty-two (252) students. They are the selected students in the Engineering and Engineering Technology programs of the Technological University of the Philippines-Manila who were enrolled during the 2nd Semester, 2014-2015 in Physics and Mathematics courses. The questionnaire was administered after they have taken the final examination in the same class-duration. The students were given 20-30 minutes to answer the questionnaire.

The initial result of the Cronbach's alpha for internal consistency reliability of the 34 items initial inventory before factor analysis was 0.882.

Factor analysis was also used in the analysis of the items, in order to identify the dominant components of the inventory. However, the researcher had to assess first, the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity to examine the sample adequacy of the study. The result of KMO of the initial inventory is 0.889 which is identified as meritorious, while Bartlett's test is 3598.930 ($p < 0.000$) which allows the rejection of the hypothesis that the correlation matrix is an identity matrix and indicating an appropriate factor structure. With these very satisfactory results, the researcher proceeded to factor analysis.

For factor analysis, the researcher used the principal component analysis (PCA) with varimax raw rotation as the method of extraction using the SPSS version 23. This explores the data and provides the researcher with information about how many factors are needed to best represent the data. Items that were retained have a factor loading of 0.40 while items that failed to load on at least one factor at greater than 0.39 and with multiple high factor loadings on the factor were deleted. For Cronbach's alpha, values with the marked substantial internal consistency of 0.60 and above were retained (Rodil, 2014).

Out of 34, only 27 statements remained, and which were loaded to five factors with a substantial internal consistency of 0.60 and above. Factor 1 described the Perceived Complexity/ Easiness toward answering MC test using CWNRET. Factor 2's statements were about the Perceived Effort Needed. Factor 3 described the Perceived Objectivity. Factor 4 was on Perceived Guessing in using CWNRET scoring method in the MC test, and lastly, Factor 5 was about Perceived Anxiety/ Trickiness. Since the Test-taker's Perception Inventory was designed for CWNRET, the researcher revised some statements and selected only the items that would fit for answering MC test using the conventional scoring method (NR scoring method). Only 24 items remained for this purpose.

4. Samples

First-year Engineering and Engineering Technology students (N=108) were selected

among the students of the Technological University of the Philippines – Manila who have taken the same subjects under the supervision of the researcher. Samples came from 3 classes. Each class was assigned on a specific scoring method (NR, NRET, CWNRET). Stratified sampling was used so that each group has the same initial academic performance based on the results of their first two quizzes using the conventional (NR) scoring method, and also their initial perception toward MC test. Two sets of groups were used in this study. The first set was composed of 52 students. Only 26 students were selected from the class who used the NR scoring method and named as Group A: NR, while for Group B: CWNRET, 26 students were also selected from the class who used the CWNRET scoring method. The second set of groups was composed of 56 students. One group of 28 students used the NRET scoring method and named as Group C: NRET, while the same number of students composed Group D: CWNRET who used CWNRET scoring method.

5. Procedure and Analysis

The study was conducted after the preliminary examination which was from 2nd week of August to 3rd week of October of the 2nd Semester, SY 2018-2019. Prior to the intervention period, students had completed the same sets of quizzes using the NR scoring method. All groups also answered the Test-taker's Perception Inventory for answering MC test using NR scoring method after they completed the first two quizzes.

After the preliminary examination, two same quizzes were completed by each group but using the different scoring methods. Group A used NR scoring method, Group C used NRET scoring method, and Group B and Group D used CWNRET scoring method. To be able to compare the scores from the different scoring methods, the researcher transformed these scores into percentage scores. The score of the student in a particular scoring method has to be divided by the total score in that scoring method then multiplied by 100.

After these quizzes, Groups B, C, and D answered the post-survey of Test-taker's Perception Inventory for answering MC test using their respective scoring method. Then, at the end of the study, the final exam was taken by all groups using the conventional scoring method.

6. Results and Discussion

The objective of this study is to determine the perception and academic performance of the students in using CWNRET compared to NR and NRET scoring method in answering MC test.

6.1 Initial Academic Performance and Perception toward MC Test.

To be able to properly compare the effect of the different scoring methods, the samples were controlled based on the following requirements: the two groups that will be compared should have no significant difference in their initial academic performance and initial perception toward MC test. To do this, the researcher used stratified sampling to achieve an equal variance on the initial academic performance and initial perception toward MC test between the groups. Levene's test for Equality for Variances was used for this purpose. The resulting p-value of Levene's test in the perception of both sets of groups: Group A vs. Group B ($F=0.037$, $p=0.848$) and Group C vs Group D ($F=3.894$, $p=0.054$) is greater than 0.05 alpha. Thus, the null hypothesis of equal variances is accepted, and it is concluded that there is no significant difference in the variances between the two groups compared. It is also shown in Table 1 that the mean of percentage scores of their first two quizzes which represent their initial academic performances is not significantly different to each other. Group A vs. Group B has a t-value of 0.199 and $p=0.843$ while Group C vs Group D has a t- value of 0.22 and $p=0.826$. Table 1 also shows that the initial perception of the students in the MC test is not significant between groups. Group A vs Group B has a t-value of -1.339 and $p=0.187$ while Group C and Group D has a t-value of .678 and $p=0.501$.

Table 1. T-test for Independent samples Results for Academic Performance and Perception of Students toward MC Test

	Groups	N	Mean	Std. Dev.	Levene's Test for Equality of Variances		t-test for Equality of Means	
					F	Sig.	t	Sig. (2-tailed)
Initial Academic Performance	Group A: NR	26	56.4846	8.1375	0.037	0.848	0.199	0.843
	Group B: CWNRET	26	56.0577	7.32514				
	Group C: NRET	28	69.1107	9.06664	3.894	0.054	0.22	0.826

(Pre-Quizzes)	Group A: NR	26	68.6464	6.49373				
Perception (Pre)	Group A: NR	26	2.9350	.36888	.100	.753	-1.339	.187
	Group B: CWNRET	26	3.0677	.34515				
	Group C: NRET	28	3.1393	.41146	.234	.630	.678	.501
	Group D: CWNRET	28	3.0718	.32938				
Academic Performance (Practice Quizzes)	Group A: NR	26	56.2769	6.04459	.692	.409	8.014	.000
	Group B: CWNRET	26	41.4231	7.26506				
	Group C: NRET	28	50.5429	7.33371	.282	.598	2.617	0.011
	Group D: CWNRET	28	45.2750	7.72215				
Perception (Post)	Group A: NR	26	2.9350	.36888	1.029	.315	.476	.636
	Group B: CWNRET	26	2.8888	.32870				
	Group C: NRET	28	2.8079	.28510	1.603	.211	-.584	.562
	Group D: CWNRET	28	2.8554	.32290				
Academic Performance (Final Exam)	Group A: NR	26	45.1291	8.71817	.077	.783	-1.231	.224
	Group B: CWNRET	26	48.2219	9.39243				
	Group C: NRET	28	58.3796	9.39316	.851	.360	-.302	.764
	Group D: CWNRET	28	59.1775	10.34630				

6.2 Perception of Students using CWNRET

The assumption of the researcher was that the mean rating in the Test-taker's Perception Inventory of the students towards CWNRET is significantly lower compared to NR and NRET scoring method because CWNRET is more complicated to use compared to NR and NRET scoring method, and CWNRET uses penalty scores. But, the result of the post-survey for the perception of the students in Table 2 shows that there is no significant difference in the perception of students who used NR and NRET scoring methods to the perception of students who used CWNRET scoring method. But, through examining each factor, Table 3 shows that the perceived effort needed by the students who use CWNRET scoring method is significantly higher compared to the perceived effort needed of the students who used NR scoring method. Thus, groups that used CWNRET perceived that they need greater effort in preparing for MC test when this method is used. As expected, the result also shows that and perceived anxiety or trickiness in using CWNRET scoring method is significantly higher compared to the students who used NR scoring method.

Table 2. T-test for Independent Samples Results for each Factor of Post-survey of Test-taker's Perception Inventory

					t-test for Equality of Means	
Factors	Scoring Method	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Perceived Complexity/ Easiness	Group A: NR	26	2.4996	.41678	.049	.961
	Group B: CWNRET	26	2.4919	.69124		
	Group C: NRET	28	2.4357	.52671	.092	.927
	Group D: CWNRET	28	2.4204	.71261		
Perceived Effort Needed	Group A: NR	26	3.0192	.45784	-4.887	.000
	Group B: CWNRET	26	3.5777	.36043		
	Group C: NRET	28	3.3636	.57004	-1.278	.207
	Group D: CWNRET	28	3.5479	.50709		
Perceived Objectivity	Group A: NR	26	2.9104	.52924	1.179	.244
	Group B: CWNRET	26	2.7062	.70760		
	Group C: NRET	28	2.8221	.52474	1.465	.149
	Group D: CWNRET	28	2.5718	.73673		
Perceived Guessing	Group A: NR	26	2.1538	.54349	.654	.516
	Group B: CWNRET	26	2.0577	.51627		
	Group C: NRET	28	3.2946	.50942	-.494	.623
	Group D: CWNRET	28	3.3543	.38475		
Perceived Anxiety/ Trickiness	Group A: NR	26	2.5962	.70738	2.027	.048
	Group B: CWNRET	26	2.2308	.58704		
	Group C: NRET	28	2.1786	.62678	-.282	.779
	Group D: CWNRET	28	2.2321	.78743		

6.3 Academic Performance

Based on Table 1, the post-quizzes result of the students' percentage scores between Group A vs. Group B is significantly different. This is because CWNRET scoring method utilizes penalty scheme of -3 and -1.5 which resulted in negative scores. Hence, it is expected that students' percentage scores of CWNRET are lower compared to NR. While, between Group C and Group D, there is also a significant difference in the percentage score between NRET and CWNRET score, even though this was not anticipated by the researcher since CWNRET scoring method would yield higher percentage scores compared to NRET with a student who answered the same quiz with the same mistake, and it was also shown that NRET and CWNRET scores were similar (Cisneros-Pahayahay et al., 2017). So, the researcher used the method of stepwise regression analysis (Pahayahay et al., 2017) to determine which among the five factors identified in the Test-taker's Perception Inventory is the possible predictor of Group D: CWNRET academic performance (Practice Quizzes). The result showed that Perceived Guessing is the significant predictor of Group D: CWNRET's academic performance (Practice quizzes). Based on the result, 11.0% of the variance in academic performance (Practice Quizzes) is explained by Perceived Guessing. There is also a significant positive but weak correlation between Group D: CWNRET score and their reported Perceived Guessing ($r=0.378$, $p = 0.047$). This indicate that Group D: CWNRET (mean=3.3543) students have less tendency to guess compared to Group C: NRET (mean=3.2946).

But, during the final exam, when only conventional (NR) scoring method was used, the result showed a significant difference in the percentage scores of each group. And, further examination revealed that the mean scores of the students who used CWNRET are higher compared to other groups that used the NR and CWNRET scoring methods. This result showed that CWNRET scoring method tends to improve the academic performance of the students through improving the way on how they analyze the items in answering MC test. This result confirms the finding of the study of Ling et al. (2015).

Table 3. Correlations results of Perception and Academic Performance

		Average (Q1, Q2)	Average (Q3, Q4, Q5)	Final Exam
Perception (Post)	Pearson Correlation	-.094	.067	-.094
	Sig. (2-tailed)	.333	.491	.333
	N	108	108	108
Perception (Pre)	Pearson Correlation	.150	.045	.150
	Sig. (2-tailed)	.122	.643	.122
	N	108	108	108

Lastly, using the Pearson Product-Moment correlation, the mean score from the practice quizzes of the students has no significant correlation to their post perception ($r=0.067$, $p=0.491$). The same result was revealed on the correlation of the students' percentage scores in the final exam and their post perception ($r=-0.94$, $p=0.333$). Same with the results shown in the study of Watering et al. (2008), this paper also confirms that the perception of the students toward a scoring method in answering an MC test has no significant correlation to their academic performance. This result also proved the concurrent validity of the Test-taker's Perception Inventory.

7. Conclusion

The most common assessment tool in Higher Education is the multiple choice test, and it cannot be denied that this method is used in most licensure examinations in the Philippines, hence, it is appropriate to device a tool on how teachers can help their students to analyze the items in MC test better. This study showed that, generally, the perception of the students who used CWNRET is not significantly different to the perception of the students in using NRET and NR scoring methods. However, there is a significant increase in students' perception that they need to give extra effort in answering MC test using CWNRET compared to NR scoring method.

Although, perceived anxiety/ trickiness also significantly increased when using CWNRET compared to when using NR scoring method was used. This study also showed that even if the MC tests were completed using the convention scoring method, students who have undergone CWNRET have generally higher mean score compared to students who were trained to answer other scoring methods.

One of the limitations of this study is that the sample size is too small so that the conclusion cannot be generalized into the whole population. Hence, for future researches, the researcher should do this in larger sample groups with the same academic performance and same perception in MC test. Another limitation is the test items in every test in this study were mostly conceptual. Hence, it is suggested that this should also be done in problem-solving MC test to determine if this will yield the same conclusion.

As teachers, the perception of the students is important every time a new method is introduced in the class. The perception of the students on various components or facets of classroom tests is a valuable source of information, since their perspectives affect test preparation behavior, student cooperation and test motivation during the exam, and influence the level of test performance and attainment on the exam (Zeidner, 1987). However, these ideas should not limit the teachers in their effort to improve the delivery of instruction but rather challenge them to innovate in their class and use these innovations for their improvement.

References

Cisneros-Pahayahay, M., & Pahayahay, G. (2017). Level and Quality of Knowledge Using Confidence-Weighted NRET Scoring Method in Multiple Choice Test. Advanced Science Letters, 23(2), 885-889. doi:10.1166/asl.2017.7548

Davies, P. (2002), "There's no Confidence in Multiple-Choice Testing, ..." IN: Proceedings of 6th CAA Conference, Loughborough: Loughborough.

Lau, N. K., Lau, S. H., Hong, K. S., & Usop, H. (2011). Guessing, partial knowledge, and misconception in multiple-choice tests. Journal of Education Technology & Society, 14(4), 99–110.

Ling, J., & Cavers, M., (2015) Student-weighted multiple-choice tests. See also https://prism.ucalgary.ca/bitstream/handle/1880/50553/2015_Ling_and_Cavers_Paper.pdf?sequence=1

Pahayahay, G., & Cisneros-Pahayahay, M. R. (2017). Assessment of Students' Metacognitive Awareness Level in College Algebra. Advanced Science Letters, 23(2), 1130-1133. doi:10.1166/asl.2017.7517

Rodil, M.S. (2014). Development and Validation of an Inventory that Measures Motivated Behavior in Chemistry. Journal of Education and Practice. 5 (34), 79-85.

Scouller, K. (1998) The influence of assessment method on students' learning approaches: Multiple choice question examination versus assignment essay. Higher Education. 35: 453–472. See also https://doi.org/10.1023/A:1003196224280

Xu, X., Kauer, S., & Tupy, S. (2016). Multiple-choice questions: Tips for optimizing assessment in-seat and online. Scholarship of Teaching and Learning in Psychology, 2(2), 147.

Yonker, J. E. (2011). The relationship of deep and surface study approaches on factual and applied test-bank multiple-choice question performance. Assessment & Evaluation in Higher Education, 36: 673– 686.

Tarun, I. M., Gerardo, B. D., & Tanguilig, B. T., III. (2014). Generating Licensure Examination Performance Models Using PART and JRip Classifiers: A Data Mining Application in Education. International Journal of Computer and Communication Engineering, 3(3), 202-207. doi:10.7763/ijcce.2014.v3.320

Tozoglu D, Tozoglu MD, Gurses A, Dogar C (2004). The students' perceptions: Essay versus multiple choice type examination. J. Baltic Sci. Educ. 2(6): 52-59.

Watering, G. V., Gijbels, D., Dochy, F., & Rijt, J. V. (2008). Students' assessment preferences, perceptions of assessment and their relationships to study results. Higher Education, 56(6): 645-658. See also doi:10.1007/s10734-008-9116-6

Zeidner M (1987). Essay versus multiple-choice type classroom examination: The students' perspectives. J. Educ. Res. 80(6): 352-358.