The Dunning–Kruger Effect: A Comparative Analysis of Perceived and Actual Performance among Rubric-Trained and Untrained University Students

Raba'a Taleb Abadel[1], Shiraz Al-Ali[2,3,*], Eisa Al-Balhan[4], Elsayed Mahmoud[5] & Elaf Almansour[6]

[1]College of Arts and Sciences, Umm Al Quwain University, UAE

[2]Department of Sociology, City University of Ajman, Ajman.UAE

[3]Department of Sociology, Colleg of Arts and Scinces, University of Sharjah, Sharjah, UAE

[4]Department of Education Psychology, Kuwait University, Kuwait

[5]College of Humanities, City University, Ajman, UAE

[6]College of Humanities and Sciences- PPTD, City University, Ajman, UAE

*Correspondence: Department of Sociology, City University of Ajman, Ajman.UAE & Department of Sociology, Colleg of Arts and Scinces, University of Sharjah, Sharjah, UAE

Received: December 3, 2025 Accepted: February 23, 2026 Online Published: April 30, 2026

doi:10.5430/jct.v15n2p116 URL: https://doi.org/10.5430/jct.v15n2p116

Abstract

This study aims to investigate how training students on using rubrics (i.e., assessment criteria which they helped create) in self-assessment activities influences the Dunning-Kruger effect. The proposition was that getting students involved in rubric creation and training in rubric use for self-assessment would improve their awareness of their actual performance and reduce the Dunning–Kruger effect. This study was conducted with 98 senior business English students and revealed that high-performing rubric-based-trained students were more aware of their actual performance than their peers, and that the Dunning-Kruger effect was reduced in this group. In contrast, the Dunning-Kruger effect appeared with different magnitudes across other student groups, being very clear among low-performing trained and untrained students and somewhat clear among high-performing untrained students. Therefore, these results recommend that rubric-based training improves metacognitive calibration and reinforces more accurate self-evaluation in academic assessment contexts, and it also sheds light on the pedagogical value of rubric-based training in higher education.

Keywords: dunning-kruger effect, self-assessment, students' performance, rubrics-based training, higher education

1. Introduction

1.1 Introduce the Problem

Students need to be trained to accurately perceive their own performance, as this is a skill. Significantly, the inability to recognize one's own mistakes among students can negatively impact their actual academic achievement, self-regulated learning, competency, and lifelong learning skills. It is a constant in the work of instructors for students to be dissatisfied with their grades and to claim that they expected higher grades than what they actually received, which is owed to a self-perception of having answered the exam "perfectly." This phenomenon of overestimating one's capabilities and unawareness of one's own deficiencies was first described by the psychologists Kruger and Dunning (1999) and is now known as the "Dunning-Kruger effect".

The Dunning-Kruger effect describes that this lack of awareness owes to a "double curse" among students with low academic performance, in that their lack of skill deprives them not only of the ability to produce correct responses but also of the expertise necessary to surmise that they are not producing them. Furthermore, Kruger and Dunning (1999) proposed that while individuals with lower competence tend to overestimate their abilities, those with higher competence underestimate their skills. People frequently rely heavily on their assessments of their own performance on preconceived ideas about their own abilities, but because these ideas frequently do not correspond with objective performance, they might result in erroneous conclusions that diverge dramatically from actual achievements. (Dunning

et al., 2003). Moreover, research has shown that people tend to be either unaware of or indifferent to their own biases (Pennycook et al., 2017).

The literature review for this study shows that there is a dearth of research on the effect of student training on the use of rubrics for self-assessment activities, and the extent to which such use influences the magnitude (or even presence) of the Dunning-Kruger effect. Accordingly, this study was designed to shed light on the prevalence of the Dunning-Kruger effect among students who underwent rubric-based training—a structured assessment method (Popham, 1997)—and those who did not (i.e., rubric-trained students vs. untrained students), and compare their self-assessments of performance with their instructor's assessments of their performance. It was expected that engaging students in extensive rubric-based training would lead to improvements in their self-perception of actual performance and self-recognition of errors, enabling them to improve their learning habits. Theoretically, the proposition here is that when students become aware of the criteria on which they will be evaluated, the Dunning-Kruger effect reduces. Therefore, researchers, educators, and curriculum designers may find value in the study's findings, which demonstrate how integrating student rubric-based training into curriculum design can support the growth of learner independence and improve students' ability to identify their true performance.

2. Literature Review

2.1 Dunning-Kruger Effect

As mentioned in the prior section, the Dunning-Kruger effect can be considered a cognitive bias that leads people with high performance to tend to underestimate their skills and knowledge, while people with low performance in a given area tend to unknowingly overestimate their performance. In psychology, a cognitive bias refers to unfounded beliefs that people have without being aware of them. The Dunning-Kruger effect, according to Lawrenz and Vandergriedt (2022), happens when someone lacks expertise in a particular field but nevertheless believes they are fully qualified to express opinions or perform tasks in that field, despite the opinions of others and objective measurements.

Magnus and Peresetsky (2022) state that comparing self-evaluation with objective performance is a common way to gauge the Dunning-Kruger effect. For instance, after completing a quiz, participants might estimate how well they did, and this estimate might be compared to their real scores. Indeed, Kruger and Dunning (1999) conducted four studies to investigate students' awareness of their actual performance. Across these four studies, they assessed participants' actual and perceived abilities and performance in English grammar, humor, and logical reasoning. Students were given examinations to complete, and they were also asked to assess themselves. In the English grammar study, for instance, 84 students evaluated their own grammatical proficiency and test results after completing a knowledge test on standard American written English. Individuals with the lowest test scores (10th percentile) tended to significantly exaggerate their perceived linguistic ability (67th percentile) and test performance (61st percentile), whereas those with the highest scores tended to underestimate both. Subsequently, Kruger and Dunning (1999) determined that incompetent students who overestimated their performance and skills did not have the necessary insights into their incompetence, and thus they had some sort of "ignorance of one's own ignorance." The researchers also observed that low performers chose answers that seemed the most appropriate to them, while high performers underestimated their performances, attributing these phenomena to metacognitive skill deficits.

Dunning (2011, p. 252) attributes this meta-ignorance (i.e., ignorance of ignorance) to either the adoption of false beliefs and knowledge, which seem sufficient to the adopter for building up the "correct" answer, or the deficiency in knowledge and experience that lies in the "unknown unknowns," referring to the knowledge one needs but lacks without being aware of such lack. Horgan (1990) and Fitzgerald et al. (1997, as cited in Grimes, 2002) found positive relationships between metacognitive skills, accurate self-assessment, and academic achievement. In a study conducted with psychology students, Caputo and Dunning (2005, as cited in Dunning 2011, p. 254) e-mailed a sample of graduate students and asked them to criticize the methods used in four separate studies, and then evaluate the performance of the results of these studies. What they found was that students overlooked many items owing to a lack of skills and experience. Barnsley et al. (2004, as cited in Dunning, 2011, p. 254) conducted a study with medical interns, observing that the results of the interns' self-assessments on seven common clinical procedures were better than those of the self-assessments of their tutors. Moreover, Coutinho et al. (2020) conducted a study with psychology students at Zayed University in Abu Dhabi, in the United Arab Emirates, to determine the generalizability of the Dunning-Kruger effect in the Emirates. They used the Cognitive Reflection Test (also known as CRT) to measure students' analytical thinking, where for each problematic item on the Test, there was a hint of an incorrect intuitive response; that is, participants had to overcome the intuition to approach the correct answer. According to Coutinho et al. (2020), students who performed the worst were also the most likely to overestimate their performance, whereas those who performed

averagely showed less overestimation, and those who performed the best somewhat overestimated.

In a contemporary revision, Kun et al. (2023) examined the Dunning-Kruger effect among Bachelor of Science-level business students in the realm of knowledge management, delivering empirical evidence supportive of the effect. This research, which is part of an ongoing series since 2015 at the University of Debrecen in Debrecen, Hungary, underscored the correlation between self-assessment and actual test scores. Although the researchers acknowledged the limitations of a small sample size and the findings' contextual specificity to knowledge management courses, the findings do contribute significantly to our understanding of the manifestation of the Dunning-Kruger effect in academic settings. This cited study also emphasized the need for future research with broader contextual considerations and larger sample sizes. Meanwhile, Simons (2013) argued that to accurately evaluate one's own performance, one needs both memory and knowledge of one's own skills and an appropriate comparison group. Any deficiency in any of these factors results in an overestimation or underestimation of self-performance. Simons (2013) hypothesized that the Dunning-Kruger effect would disappear if participants received feedback on their skills and performance, and conducted a study to assess the validity of this hypothesis with 165 bridge club players. In this cited study, player pairs were created and had to compete against themselves, after which each player had to assess their own final performance. The results revealed that the Dunning-Kruger effect persisted even after feedback provision, as the players with a lower performance overestimated their own capabilities more than those with improved skills.

Doğan et al. (2023) scrutinized the Dunning-Kruger effect within the domain of online education with a sample of 41 participants enrolled in a learning psychology course. They systematically examined the metacognitive deficit that contributes to the propensity of low-performing students to overestimate their academic performance. This study underscored a notable disparity in self-estimated grade points between low and high-performing students, highlighting the intricate dynamics of the Dunning-Kruger effect in online education. According to Ehrlinger et al. (2008), low performers overestimate their true accomplishments because they are unable to identify their own shortcomings. A person's everyday life (Bunay et al., 2018), business life (Kennedy et al., 2002), and career advancement (Pavel et al., 2012) may all be hampered by this inability to acknowledge their own true performance. Furthermore, the only way to improve this is by becoming aware of one's own deficits (Plohl & Musil, 2018). Russell (1951, as cited in Ehrlinger et al., 2008) indicated that people's overestimations of identifiable capabilities and skills do not necessarily represent how they perceive themselves. Yet, this overestimation exists everywhere in real life, from classrooms to clinics, workplaces (Ehrlinger et al., 2008), sports (Simons, 2013), and from physicians to engineers, drivers, and academics. In fact, a number of studies have examined whether the Dunning-Kruger effect exists in numerous communities and fields, with comparable findings. These populations and fields include the following: Vocabulary, humor, and logical reasoning among psychology students (Bunay et al., 2018); sociology, marketing, and management for business and non-business students at private and public universities (Kennedy et al., 2002); physics and chemistry (Lindsey & Nagel, 2015); grammar and aviation (Pavel et al., 2012); mathematics, linguistics, and formal reasoning (Battistelli et al., 2009; Coutinho et al., 2020).

2.2 Students' Self-assessment

Self-assessment is a vital component of learning, and it is thus unsurprising that educators and researchers have extensively engaged in its definition. Panadero et al. (2016, p. 804) defined self-assessment as a "wide variety of mechanisms and techniques through which students describe (assess) and possibly assign merit or worth to (evaluate) the qualities of their own learning processes and products." Meanwhile, Boud and Falchikov (1989, p. 529) defined it as "the involvement of learners in making judgments about their achievements and the outcomes of their learning." Boud (1995, p. 17) emphasized that "Self-assessment is about students developing their learning skills. It is not primarily about individuals giving themselves marks or grades. And it is not about supplanting the role of teachers." Therefore, student self-assessment encompasses the acts of gathering information and reflecting on one's own learning, and enhances the potential of learners becoming lifelong learners.

Understanding students' self-assessments in the context of writing and writing instruction is crucial for several reasons. First, self-assessment promotes learner autonomy and independence, empowering students to take ownership of their own learning (Boud, 1995; Al-Mwzaiji & Alzubi, 2022; Andrade, 2019; Panadero et al., 2016). It also aligns with learner-centered education (Syefriwanti, 2022), which in turn acknowledges that learners are central to the learning process (Harris, 1997; Butler & Lee, 2010), recognizes their role in evaluating own progress and whether their needs are fulfilled (Hunt et al., 1989), and focuses on getting students actively involved in goal-setting and progress-monitoring activities (Angelo & Cross, 1988). Learners' active engagement in various learning processes, including self-assessment, is paramount (Al-Mwzaiji & Alzubi, 2022). Moreover, self-assessment serves as an indirect metacognitive language learning strategy that is particularly significant in online learning environments, which are

characterized by limitations to immediate feedback provision from teachers owing to technological constraints (Al-Mwzaiji & Alzubi, 2022). Student self-assessment also promotes lifelong learning skills (Brown, 2004).

Second, self-assessment encourages critical thinking and problem-solving skills (O'Malley & Pierce, 1996), allowing students to reflect on their learning experiences (Chen, 2008). By engaging in self-assessment, students become more aware of their strengths and weaknesses (Javaherbakhsh, 2010), which in turn fosters a deeper understanding of their own writing skills (Naeni, 2011; Birjandi & Siyyari, 2010; Zheng et al., 2012).

Additionally, there is still a lack of research on the influence of self-assessment on writing self-efficacy, despite the fact that several studies have concentrated on the impacts of self-assessment on writing skill and techniques (Takarroucht, 2022). Writing self-efficacy is essential for writing instruction because it relates to students' confidence in their own ability to apply writing strategies and achieve communicative goals (Teng & Zhang, 2016). In fact, studies have shown that implementing self-assessment activities tailored to different writing process phases can enhance students' knowledge of writing criteria and improve their perceptions of their own writing skills (Takarroucht, 2022). Self-assessment also fosters writing self-efficacy by promoting self-regulation skills, such as metacognitive self-regulation strategies, throughout the writing process (Takarroucht, 2022). In so doing, self-assessment influences students' ability to reflect on their writing, enhances their awareness of writing quality criteria, encourages them to apply these criteria in their self-assessments, and influences students to set goals for improvement, leading to improved confidence in their own writing skills (Panadero et al., 2017).

It is also clear that traditional approaches to teaching writing, which focus primarily on the writing product, have proven insufficient in fostering students' writing proficiency. The recent shift toward process-based approaches aligns with the broader goals of modern education of promoting lifelong learning and learner autonomy, particularly in the writing realm (Bing, 2016). Still, for this shift to be comprehensively successful, those implementing it should have a deep understanding of how students engage in and perceive their writing processes. Students' proficiency in writing self-assessment skills may allow them to recognize mistakes, understand the reasons behind them, and improve their writing skills as a consequence (Al-Mwzaiji & Alzubi, 2022). By engaging in self-assessment, learners can identify errors in understanding and producing language, assess their progress, and take corrective actions (Oxford, 1990, as cited in Al-Mwzaiji & Alzubi, 2022). These processes enhance students' sense of responsibility and ultimately lead to improved learning progress (Al-Mwzaiji & Alzubi, 2022). Research has also shown a positive correlation between students' self-assessment and academic achievements in writing (Khonbi & Sadeghi, 2012; Butler & Lee, 2010; Sadeghi & Abolfazli, 2014), indicating that engagement in self-assessment strategies may help to enhance their writing skills. However, the effectiveness of self-assessment strategies depends on adequate training and guidance for students to accurately grasp and apply them (Al-Mwzaiji & Alzubi, 2022).

In writing and writing instruction contexts, students' self-assessments can also be used to provide insights into the effectiveness of different pedagogical approaches in enhancing writing proficiency (Meihami & Varmaghani, 2013). For example, observing how students assess their own texts allows educators to understand students' cognitive processes and strategies employed during writing tasks (Meihami & Varmaghani, 2013). This understanding can then be useful to inform educators' decisions about tailored instructional practices according to students' writing needs and challenges. Additionally, investigating students' self-assessment processes can be helpful for identifying influencing factors of their decision-making, such as language proficiency, writing experience, and familiarity with assessment criteria (Meihami & Varmaghani, 2013). Access to data on these factors can empower educators to provide targeted support and interventions that can then effectively scaffold student writing development. Overall, studies on students' self-assessments in the context of writing instruction hold potential to provide us with valuable insights for optimizing teaching practices and students' writing proficiency and metacognitive skills.

2.3 Aims and Significance

Kun et al. (2023) stressed the importance of conducting studies on the Dunning-Kruger effect in a wider range of contexts and utilizing larger sample sizes. Furthermore, the literature review conducted for this study, presented in Section 2, suggests that researchers have largely overlooked investigations into the relationship between student training and the impact of rubrics for self-assessment on the magnitude, or even existence, of the Dunning-Kruger effect. I argue that further research along these lines would significantly contribute to both the theoretical understanding and practical application of the Dunning-Kruger effect in educational settings.

In addition, in research like that conducted by Doğan et al. (2023), the researchers used multiple-choice tests, which in turn do not provide students with concrete assessment criteria—unless they are followed by open-ended thinking procedures. At the same time, Caputo and Dunning (2005, as cited in Dunning 2011, p. 254) indicated that students might perform poorly because they lack the necessary skills and experience in self-assessment, while Plohl and Musil

(2018) described that the only way to improve self-recognition is to be aware of one's own deficits. Based on the descriptions of the two last cited studies, I hold that getting students involved in assessment criteria creation and training them on their use may improve students' future learning, self-regulation, and ownership of lifelong learning skills. These processes may also help reduce differences between students' self-assessments and the instructor's assessments of students (the Dunning-Kruger effect). Therefore, this study sought to examine the impact of training students in the use of self-assessment rubrics, which were developed with their participation, on the extent or presence of the Dunning-Kruger effect. The following research hypotheses are proposed:

Hypothesis 1. There are no significant differences between the self-assessments of high-performing, rubric-based, trained students and their instructors' assessments.

Hypothesis 2. There are no significant differences between the self-assessments of low-performing rubric-based trained students and their instructors' assessments.

Hypothesis 3. There are no significant differences between the self-assessments of high-performing untrained students and their instructors' assessments.

Hypothesis 4. There are no significant differences between the self-assessments of low-performing untrained students and their instructors' assessments.

3. Methodology

3.1 Study Design

The design of this study is quasi-experimental. The study participants were 98 full-time senior business English students at the University of Aden during the 2023-2024 spring semester. The inclusion criterion was an overall class attendance of≥ 75% of the total number of lectures, while the exclusion criterion was an overall class attendance of < 75%. Participation in this study was entirely voluntary, and students faced no adverse consequences for choosing not to participate. The students were divided into two groups: the experimental group (47 students) and the control group (51 students). The course in which the students enrolled was "Introduction to Research Writing," which has three credit hours over 15 weeks. This course prepares students to write their research papers in the next semester.

3.2 Materials and Procedure

Initially, the evaluation criteria were decided according to the syllabus and students' course books, and the evaluation items were responded to on a three-point Likert Scale. This preliminary evaluation form was circulated to obtain expert opinions on external and substantive validity. Accordingly, appropriate changes were made.

Both the experimental and control groups were taught, during the course, on how to write the following topics of a research paper: a title; research objectives; questions; limitations of the study; literature review; design and conduct the research methods; data collection and analysis; findings reporting; discussion; conclusion; recommendations; references; how to format the entire research paper.

In addition, and in parallel to these theoretical explanations provided in the course, the experimental group received intensive and comprehensive training on the application of the theory. Through open classroom discussions, students in the experimental group were encouraged to derive and propose criteria for evaluating each part of a research paper, starting with the title and ending with the final format of the research paper. The experimental group was given extra time for such training, and this process led to the creation of the rubrics that would be used subsequently. Then, for each item on the structure of a research paper, samples of the work of former high and low performing students were presented to students in the experimental group, who were then asked to assign scores to these items using a scale ranging from 1 to 3 (1, item needs more modifications to match the criteria; 2, item needs a few corrections; 3, item needs no changes). The students then had to discuss and justify the scores awarded. In the experimental group, this training was conducted in all classes throughout the semester. All students in the experimental group were made aware that their self-assessments would not be included in their final grades.

The control group did not undergo rubric creation nor rubric-based training, and thus was only exposed to the conventional course and its standard methods. They underwent theoretical explanations, open classroom discussions, and were exposed to the samples of the work of former students, and had to evaluate them based on the research structure of their textbooks. They were unaware of the existence of rubrics.

In the course in which both student groups were enrolled, after the theoretical explanations and in order to prepare students for the actual mandatory writing of an extensive research paper in the following semester, the students were asked to individually start to write their own simplified research paper. In the experimental group, students were asked

not only to start writing their papers but also to refer to the evaluation criteria that they helped create. Then, if students in the experimental group found an item in their own paper that did not meet the evaluation criteria, they were required to rewrite it in their final work. After writing their essays, all students in both groups were asked to rate their performance. In this performance assessment procedure, the control group only referred to the items for writing a research paper present in their books used during the course, whereas the experimental group used the rubrics they helped create.

Finally, the instructor assessed the students' performances. She referred to the college's score distribution to classify students' performance, which in turn encompasses the three categories of high, medium, and low scores. The scores for a high performing student were in the range of 80–100% (i.e., high to very high, respectively), while those of low performing students were in the range of 0–64% (i.e., fair to fail, respectively).

3.3 Ethics Disclosure

The Ethics Committee (UAQU/Research/Ethical Approval/01/02/2024) granted approval for the study. Subsequently, authorization to conduct the research was obtained from the Dean and the Vice Dean for Academic Affairs of the Faculty of Languages and Translation at the University of Aden. At the commencement of the 2023-2024 spring semester, students were invited to participate voluntarily in the study. They received a concise overview of the research project and were assured that all data collected would remain confidential and be utilized exclusively for research purposes. In order to determine the relationship between the students' self-evaluation and their instructor's evaluation, the data were analyzed using SPSS, which produced descriptive and inferential statistical measures such as means, standard deviation, t-values, with their significance levels, and Pearson's correlation coefficient.

4. Results

Table 1 presents the respondents' demographic information. The experimental group encompassed 23 high and 13 low performing students, while these figures in the control group were 5 and 30, respectively. Students with medium performance in both groups were excluded from the revision (Table 1).

Table 1. Respondents' Information

Group	No.	%
Rubric-based trained group	47	47.96
Untrained group	51	52.04

4.1 Hypothesis 1

To examine discrepancies between the high-achieving rubric-based trained students' self-assessment scores and their instructor's assessment scores, the means, standard deviations, Pearson's correlation coefficients, and t-test were computed. The results are presented in Tables 2 and 3. Table 2 shows the descriptive statistics of the self-assessments of high-performing rubric-based trained students (M = 55.74, SD = 2.83) compared with their instructors' assessments (M = 56.17, S.D = 2.39), which were shown to have similar mean values.

Table 2. Descriptive Statistics of High-Performing Rubric-Based Trained Students' Self-Assessments and Their Instructors' Assessments

Data	Mean	N	SD
High-performing rubric-based trained students' self-assessments	55.74	23	2.83
Instructor's assessments	56.17	23	2.39

Highly performing rubric-based trained students' self-assessments and their instructors' assessments have a strong positive association, as shown by Table 3's Pearson's correlation coefficient of 0.915, which is statistically significant at the 0.05 level. Additionally, it displays the findings of a paired sample t-test to ascertain whether there are statistically significant differences between the mean values of high-performing rubric-based trained students' self-assessments and their instructors' assessments. There is no statistically significant difference between students' self-evaluations and their instructors' evaluations, as indicated by the t-value of 1.796 and the p-value of 0.086.

Table 3. Correlations, T-test & p-value between High-Performing Rubric-Based Trained Students' Self-Assessments and Their Instructors' Assessments

Variables	r	Sig.	Differences		T-test	df	p-value
			Mean	SD			
High-performing rubric-based trained students' self-assessments and their instructors' assessments	0.915**	0.000	0.4348	1.161	1.796	22	0.086

**. Correlation is significant at the 0.05 level (2-tailed).

4.2 Hypothesis 2

The means, standard deviations, correlations, and t-test of the self-assessment scores of low-performing rubric-based trained students were calculated to investigate differences between their self-assessments and their instructor's assessment scores. The results are presented in Tables 4 and 5. Table 4 shows the descriptive statistics of the low-performing rubric-based trained students' self-assessments compared to their instructors' assessments. The mean score of the self-assessments of students (M = 35.46, SD = 1.198) was higher than that of their instructor's assessments (M = 31.62, SD = 1.45).

Table 4. Descriptive Statistics of the Low-Performing Rubric-Based Trained Students' Self-Assessments and Their Instructors' Assessments

Data	Mean	N	SD
Low-performing rubric-based trained students' self-assessments	35.46	13	1.198
Instructor's assessments	31.62	13	1.45

Table 5 shows a Pearson's correlation coefficient of 0.400, indicating a low positive correlation between the self-assessments of low-performing rubric-based trained students and their instructors' assessments.

It also shows the results of a paired sample t-test to determine if the differences in mean values between the self-assessments of low-performing rubric-based trained students and their instructors' assessments are statistically significant. The mean value was 3.846, and the t-value was 9.477, the latter being significant at the 0.05 level. These results show a statistically significant difference between low-performing rubric-based trained students' self-assessments and their instructors' assessments.

Table 5. Correlations, T-test, and p-value between Low-Performing Rubric-Based Trained Students' Self-Assessments and their Instructor's Assessments

Variables	r	Sig.	Differences		T-test	df	p-value
			Mean	SD			
Low-performing rubric-based trained students' self-assessments and their instructors' assessments	0.400	0.176	3.846	1.463	9.477	12	0.000

4.3 Hypothesis 3

The results for high-performing untrained students are shown in Tables 6 and 7. Table 6 presents the descriptive statistics of high-performing untrained students' self-assessments compared with their instructors' assessments, indicating that the mean value for students' self-assessments (M = 49.00, SD = 5.34) differed from that of the instructors' assessments (M = 59.40, SD = 0.894).

Table 6. Descriptive Statistics of High-Performing Untrained Students' Self-Assessments and Their Instructors' Assessments

Data	Mean	N	SD
High-performing untrained students' self-assessments	49.00	5	5.34
Instructor's assessments	59.40	5	0.894

Table 7 shows that there is a moderately positive correlation between high-performing untrained students' self-assessments and their instructors' assessments.

It also shows the results of a paired sample t-test to determine if the differences in mean values between the self-assessments of high-performing untrained students and their instructors' assessments are statistically significant. The results show that the t-value of 4.818 was greater than the critical t-value of 2.776 at the 0.05 significance level, indicating a statistically significant difference between the high-performing untrained students' self-assessments and their instructors' assessments.

Table 7. Correlations, T-test, and p-value between High-Performing Untrained Students' Self-assessments and Their Instructor's Assessments

Variables	r	Sig	Differences		T-test	df	p-value
			Mean	SD			
High-performing untrained students' self-assessments and their instructors' assessments	0.628	0.256	10.400	4.827	4.818	4	0.009

4.4 Hypothesis 4

The results for low-performing untrained students are shown in Tables 8 and 9. Table 8 shows the descriptive statistics of the self-assessments of low-performing untrained students compared to their instructors' assessments, indicating that the mean value for untrained students' self-assessments (M = 50.37, SD = 4.88) differed from that of their instructors' assessments (M = 26.07, SD = 7.44).

Table 8. Descriptive Statistics of Low-Performing Untrained Students' Self-Assessments and Their Instructors' Assessments

Data	Mean	N	SD
Low-performing, untrained students' self-assessments	50.37	30	4.88
Instructor's assessments	26.07	30	7.44

Table 9 shows a Pearson's correlation coefficient of 0.397, indicating a weak positive correlation between the self-assessment of low-performing untrained students and their instructors' assessments.

Table 9. Correlations, T-test & p-value between Low Performing Untrained Students' Self-assessments and Their Instructor's Assessments

Variables	r	Sig.	Differences		T-test	df	p-value
			Mean	SD			
Low-performing, untrained students' self-assessments and their instructors' assessments	0.397	0.030	24.30	7.09	18.76	29	0.000

Additionally, it displays the findings of a paired sample t-test to ascertain whether there are statistically significant discrepancies between the mean values of low-performing untrained students' self-evaluations and their instructors' assessments. The results showed a mean value of 24.30 and a t-value of 18.76, the latter being significant at the 0.05 level, indicating a statistically significant difference between low-performing untrained students' self-assessments and their instructors' assessments.

Pearson's correlation coefficients between the low and high performing students in the experimental and control groups are compared in Table 10. The findings showed that in both groups, low-performing students underestimated their own performance more than high-performing students. In other words, students who received instruction on using rubrics for self-evaluations did not exhibit the Dunning-Kruger effect.

Table 10. Comparison of the Correlation Coefficients between the Low and High Performing Students in the Experimental and Control Groups

Students' self-assessment	Instructor's assessment Correlation coefficient (r)	
	Experimental group	Control group
High performing students	0.915**	0.628
Low-performing students	0.400	0.397

5. Discussion

This research paper exposed no substantial differences between the self-assessments of high-performing, rubric-based, trained students and their instructors' assessments. This means that high performers who were trained in rubric use for self-assessments tended to be more aware of and accurate regarding their own performance, and did not tend toward performance overestimation. According to Horgan (1990) and Fitzgerald et al. (1997, as cited in Grimes, 2002), such an alignment between self-assessment of performance and actual performance indicates a positive relationship between metacognitive skills, accurate self-assessment, and academic achievement. I thus propose that if high-performing students are well-trained on the use of rubrics for self-assessment purposes, the Dunning-Kruger effect may be absent. This finding highlights the importance of raising students' awareness of evaluation criteria to enable them to objectively assess their performance.

Moreover, high-performing untrained students in the sample tended to underestimate their performance, as reflected in their lower self-assessment scores compared to those of their instructor. Moreover, there was a significant difference between the self-assessment of high-performing untrained students and their instructors' assessments, albeit the correlation between these two sets of evaluations was moderately positive. This finding is congruent with those in the studies by Kruger and Dunning (1999), Dunning (2011), Battistelli et al. (2009), Bunay et al. (2018), Kennedy et al. (2002), Lindsey and Nagel (2015), and Pavel et al. (2012).

The systematic involvement of student participants in the creation of the evaluation criteria and their training on the use of such criteria for their self-assessments was shown to be associated with a reduction in the Dunning-Kruger effect among high-performing students. Training students to use rubrics for self-assessment may thus be related to their developing a better understanding of their own strengths and weaknesses, assisting them in adopting improved learning strategies and learning behaviors. The same did not occur among high-performing untrained students, who tended to underestimate their achievements, indicating that they may have lacked the necessary metacognitive skills for accurate self-assessment. Such findings provide further evidence toward the proposition that the existence of the Dunning-Kruger effect hinges on a lack of awareness of self-performance.

Regarding low-performing rubric-based trained students, the weak correlation between their self-assessments and their instructor's assessments, along with the significant statistical difference between the two, indicated a lack of alignment between the two sets of evaluations. In general, the related findings provide reinforcement for the existence of the Dunning-Kruger effect among low-performing students, and that it exists even when they get involved in rubric creation and training on its use for self-assessments.

Similar results were obtained for low-performing untrained students, but the difference between their self-assessments and their instructor's assessments was much higher than this same difference among low-performing rubric-based trained students. According to Ehrlinger et al. (2008), the overestimation of low-performing students may be attributed to students' failure to recognize their own shortcomings and errors. This result is consistent with those in the studies by Coutinho et al. (2020), Caputo and Dunning (2005, as cited in Dunning, 2011), and Barnsley et al. (2004, as cited in Dunning, 2011, p. 254).

In summary, rubric-based training can enhance the self-awareness and self-assessment accuracy of high-performing students; however, its impact on low-performing students is limited. Future educational strategies should prioritize the development of metacognitive skills among all students, with particular attention to those who struggle with self-awareness in their academic performance.

6. Limitations

This study provides valuable insights into the impact of rubric-based training on students' self-assessment accuracy and the manifestation of the Dunning-Kruger effect. However, several limitations should be noted:

First, the research was conducted exclusively with senior business English students attending full-time morning classes at the Faculty of Languages and Translation, University of Aden, during the 2023-2024 spring semester in an "Introduction to Research Writing" course. Students with 25% absenteeism or those who repeated the academic year due to failure were also excluded. While these criteria helped ensure a more homogeneous sample, they might limit the generalizability of the findings to other disciplines, educational settings, or student populations, such as part-time or evening learners and those in different subject areas, or those who experience attendance challenges or have a history of academic difficulties.

Second, the study focused on the short-term effects of rubric-based training. While the results indicate improvements in self-assessment accuracy among high-performing students, it remains unclear whether these benefits are sustained over time. Longitudinal research is necessary to examine the enduring impact of rubric-based training on metacognitive development.

Finally, potential variations in instructional methods, feedback styles, and prior exposure to self-assessment practices were not controlled for, and these factors could have influenced the outcomes. Future research should account for these variables to better isolate the specific effects of rubric-based training.

Despite these limitations, the study contributes to the understanding of self-assessment and metacognitive development, offering important implications for curriculum design and instructional practices.

7. Conclusions and Recommendations

This study showed that high-performing trained students were associated with greater awareness of their own accuracy, tended to be able to better distinguish their actual performance and the target learning outcomes, and were associated with a reduced Dunning-Kruger effect. Similar results were not observed among high-performing untrained students, implying that the latter might invest more time studying topics they already know, and thus waste valuable time that they can use to enhance their knowledge and skills. Among low-performing students, rubrics-based training did not reduce their overestimation of their own performance (i.e., the Dunning-Kruger effect), and they seemed unaware of their own mistakes and weaknesses; this may reflect negatively on their own study habits. It is also clear from Table 10 that trained students excelled over their untrained peers, regardless of self-assessment performance. Furthermore, the findings highlight that high-performing untrained students were more aware of their own performance than were low-performing trained students.

These findings generally give way to the following recommendations for research. First, future research should recruit samples with more diverse educational backgrounds to assess the generalizability of the current findings. Second, longitudinal studies should be conducted to observe whether and how the impact of rubric-based training persists over time. Third, researchers should further probe into the effectiveness of rubric-based training across different cultural contexts and in online settings.

Regarding practical recommendations, stakeholders are suggested to incorporate rubric-based training into education and curriculum design, and to devote enough time in classes for students to engage in training on self-assessment. It also seems that cultivating students' self-awareness may enable them to recognize their strengths and weaknesses, which may be achieved through promoting activities such as self-reflection exercises, peer feedback, and goal-setting strategies. Students should be provided with formative assessment tools to enable the improvement of their awareness of their own abilities. Moreover, stakeholders could develop initiatives to promote student knowledge of and engagement in metacognitive strategies such as goal setting, self-monitoring, and self-regulation, so as to help improve their awareness of their own performance and study habits.

References

Al-Mwzaiji, K. N. A., & Alzubi, A. A. F. (2022). Online self-evaluation: the EFL writing skills in focus. *Asian-Pacific Journal of Second and Foreign Language Education, 7*, Article 7. https://doi.org/10.1186/s40862-022-00135-8

Andrade, H. L. (2019). A critical review of research on student self-assessment. *Frontiers in Education, 4*, 1-13. https://doi.org/10.3389/feduc.2019.00087

Angelo, T., & Cross, K. (1988). *Classroom assessment techniques: a handbook for faculty* (2nd ed.). National Center for Research to Improve Postsecondary Teaching and Learning.

Battistelli, P., Cadamuro, A., Farneti, A., & Versari, A. (2009). Do university students know how they perform? *International Electronic Journal of Elementary Education*, *2*(1), 180-198. https://hdl.handle.net/10863/39892

Bing, X. (2016). A study of the effects of student self-assessment on the EFL writing of Chinese college students. *Journalism & Mass Communication Quarterly, 6*(2), 91-107. Retrieved from https://pdfs.semanticscholar.org/5bd7/f47a0d2d94b3b974b9fc2cfbe29d7cd726ca.pdf

Birjandi, P., & Siyyari, M. (2010). Self-assessment and peer-assessment: a comparative study of their effect on writing performance and rating accuracy. *Iranian Journal of Applied Linguistics, 13*(1), 23-45.

Boud, D. (1995). *Enhancing learning through self-assessment*. Kogan.

Boud, D., & Falchikov, N. (1989). Quantitative studies of student self-assessment in higher education: a critical analysis of findings. *Higher Education*, *18*(5), 529-549. https://doi.org/10.1007/BF00138746

Brown, H. (2004). *Language assessment: principles and classroom practices*. Longman.

Bunay, R., Siguenza, W., Flores, K., & Serp-Andrade, L. (2018). Impact of the Dunning-Kruger effect on psychology students at the University of Cuenca. In T. Andre (Eds.), *Advances in Human Factors in Training, Education, and Learning Sciences. AHFE 2017. Advances in Intelligent Systems and Computing* (Vol. 596). Springer, Cham. https://doi.org/10.1007/978-3-319-60018-5-37

Butler, Y. G., & Lee, J. (2010). The effects of self-assessment among young learners of English. *Language Testing, 27*(1)*,* 5-31. https://doi.org/10.1177/0265532209346370

Chen, Y. (2008). Learning to self-assess oral performance in English: A longitudinal case study. *Language Teaching Research*, *12*(2)*,* 235-262. https://doi.org/10.1177/1362168807086293

Coutinho, M., Thomas, J., Fredricks-Lowman, I., & Bondaruk, V. M. (2020). The Dunning-Kruger effect in Emirati college students: evidence for generalizability across cultures. *International Journal of Psychology and Psychological Therapy*, *20*(1), 29-36.

Doğan, E., Güven, Ş., Dal, N., Tok, S., & Işık, U. (2023). An investigation of the Dunning-Kruger effect in first-year college students during distance education. *Journal of Educators Online, 20*(4), 96-101. Retrieved from https://files.eric.ed.gov/fulltext/EJ1407623.pdf

Dunning, D. (2011). Chapter five - The Dunning-Kruger effect: on being ignorant of one's own ignorance. *Advances in Experimental Social Psychology, 44*, 247-296. https://doi.org/10.1016/B978-0-12-385522-0.00005-6

Dunning, D., Johson, K., Ehrlinder, J., & Kruger, J. (2003). Why people fail to recognize their own incompetence. *Current Directions in Psychological Science, 12*(3), 83-87. https://doi.org/10.1111/1467-8721.01

Ehrlinger, J., Johnson, K., Banner, M., Dunning, D., & Kruger, J. (2008). Why the unskilled are unaware: further explorations of (absent) self-insight among the incompetent. *Organizational Behavior and Human Decision Processes*, *105*(1)*,* 98-121. https://doi.org/10.1016/j.obhdp.2007.05.002

Grimes, P. W. (2002). The overconfident principles of economics student: an examination of a metacognitive skill. *Journal of Economic Education, 33,* 15-30. https://doi.org/10.1080/00220480209596121

Harris, M. (1997). Self-assessment of language learning in formal settings. *English Language, Teaching Journal, 51*(1), 12-20. https://doi.org/10.1093/elt/51.1.12

Hunt, J., Gow, L., & Barnes, P. (1989). Learner self-evaluation and assessment - a tool for autonomy in the language learning classroom. In V. Bickley (Ed.), *Language teaching and learning styles within and across cultures* (pp. 207-217). Institute of Language in Education.

Javaherbakhsh, M. R. (2010). The impact of self-assessment on Iranian learners' writing skill. *English Language Teaching, 3*(2), 213-221. https://files.eric.ed.gov/fulltext/EJ1081613.pdf

Kennedy, E. J., Lawton, L., & Plumlee, E. L. (2002). Blissful ignorance: the problem of unrecognized incompetence and academic performance. *Journal of Marketing Education, 24*(3), 243-252. https://doi.org/10.1177/0273475302238047

Khonbi, Z. A., & Sadeghi, K. (2012). The effect of assessment type (self vs. peer vs. teacher) on Iranian university EFL students' course achievement. *Language Testing in Asia, 2*(4), Article 47. https://10.1186/2229-0443-2-4-47

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, *77*(6), 1121-1134. https://doi.org/10.1037//0022-3514.77.6.1121

Kun, A. I., Farkas, J., & Juhász, C. S. (2023). The Dunning-Kruger effect in knowledge management: examination of BSc level business students. *International Journal of Engineering and Management Sciences, 8*(1), 14-21. https://doi.org/10.21791/IJEMS.2023.1.3

Lawrenz, L. (2022). The Dunning-Kruger effect explained. https://www.healthline.com/health/dunning-kruger-effect

Lindsey, B. A., & Nagel, M. L. (2015). Do students know what they know? Exploring the accuracy of students' self-assessments. *Physical Review Physics Education Research*, *11*(2), Article 020103. https://doi.org/10.1103/PhysRevSTPER.11.020103

Magnus, J. R., & Peresetsky, A. A. (2022). A statistical explanation of the Dunning-Kruger effect. *Frontiers in Psychology, 13*, Article 840180. https://doi.org/10.3389/fpsyg.2022.840180

Meihami, H., & Varmaghani, Z. (2013). The implementation of self-assessment in EFL writing classroom: an experimental study. *International Letters of Social and Humanistic Sciences, 9,* 39-48.

Naeni, J. (2011). Self-assessment and the impact on language skills. *Educational Research, 2*(6), 1225-1231.

O'Malley, J. M., & Pierce, L. V. (1996). *Authentic assessment for English language learners: practical approaches for teachers*. Longman.

Panadero, E., Brown, G. T. L., & Strijbos, J.-W. (2016). The future of student self-assessment: a review of known unknowns and potential directions. *Educational Psychology Review*, *28*(4), 803-830. https://doi.org/10.1007/s10648-015-9350-2

Panadero, E., Jonsson, A., & Botella, J. (2017). Effects of self-assessment on self-regulated learning and self-efficacy: four meta-analyses. *Educational Research Review, 22*, 74-98. https://doi.org/10.1016/j.edurev.2017.08.004

Pavel, S. R., Robertson, M. F., & Harrison, B. T. (2012). The Dunning-Kruger effect and SIUC University's aviation students. *Journal of Aviation Technology and Engineering, 2*(1), Article 6. http://doi.org/10.5703/1288284314864

Pennycook, G., Ross, R. M., Koehler, D. J., & Fugelsang, J. A. (2017). Dunning-Kruger effects in reasoning: theoretical implications of the failure to recognize incompetence. *Psychonomic Bulleting & Review, 24*, 1774-1784. https://doi.org/10.3758/s13423-017-1242-7

Plohl, N., & Musil, B. (2018). Do I know as much as I think I do? The Dunning-Kruger effect, overclaiming, and the illusion of knowledge. *Psihološka Obzorja / Horizons of Psychology, 27*, Article 20-30. Retrieved from http://psiholoska-obzorja.si/arhiv_clanki/2018/plohl_musil.pdf

Sadeghi, K., & Abolfazli, K. Z. (2014). Iranian university students' experiences of and attitudes towards alternatives in assessment. *Assessment & Evaluation in Higher Education, 40*(5), 641-665. https://doi.org/10.1080/02602938.2014.941324

Simons, D. J. (2013). Unskilled and optimistic: overconfident predictions despite calibrated knowledge of relative skill. *Psychonomic Bulletin & Review, 20*(3), 601-607. https://doi.org/10.3758/s13423-013-0379-2

Syefriwanti, N. (2022). The using of self-assessment in writing class: a case study at ABA DCC LAMPUNG. *Journal Lingua Cendikia, 1*(2), 17-38. https://jurnal.dcc.ac.id/index.php/JL/article/view/421

Takarroucht, K. (2022). The effect of self-assessment on the development of EFL writing self-efficacy: a case of Algerian higher education. *International Journal of Language Education, 6*(2), 157-168. https://doi.org/10.26858/ijole.v6i2.22065

Teng, L. S., & Zhang, L. J. (2016). A questionnaire-based validation of multidimensional models of self-regulated learning strategies. *The Modern Language Journal, 100*(3), 674-701. https://doi.org/10.1111/modl.12339

Zheng, H., Huang, J., & Chen, Y. (2012). Effects of self-assessment training on Chinese students' performance on college English writing tests. *Polyglossia*, *23*, 32-42.

Acknowledgments

Collate acknowledgements in a separate section at the end of the article before the references. List here those individuals who provided help during the research (e.g., providing language help, writing assistance, or proofreading the article, etc.).

Authors contributions

Not applicable.

Funding

Not applicable.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.