Advances in Medical Education and Practice

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

From Passive to Pleasant: Validation and Application of the Learning Enjoyment Scale in Didactic Teaching

Tarig H Merghani[1], Rasha Babiker[1], Azza O Alawad[2], Samah B Hamad[3], Nada Tawfig Hashim[4], Malay Jhancy[5]

[1]Department of Physiology, RAK College of Medical Sciences, RAK Medical and Health Sciences University, Ras-Al-Khaimah, United Arab Emirates; [2]Department of Physiology, Faculty of Medicine, Al-Neelain University, Khartoum, Sudan; [3]Department of Biochemistry, RAK College of Medical Sciences, RAK Medical and Health Sciences University, Ras-Al-Khaimah, United Arab Emirates; [4]Department of Periodontics, RAK College of Dental Sciences, RAK Medical and Health Sciences University, Ras-Al-Khaimah, United Arab Emirates; [5]Department of Paediatrics, RAK College of Medical Sciences, RAK Medical and Health Sciences University, Ras-Al-Khaimah, United Arab Emirates

Correspondence: Tarig H Merghani, Department of Physiology, RAK College of Medical Sciences, RAK Medical and Health Sciences University, Ras-Al-Khaimah, P.O. Box 11172, United Arab Emirates, Tel +971561410926, Email tarig@rakmhsu.ac.ae

Background: Learning enjoyment significantly influences motivation, enthusiasm, and overall learning experiences. Past studies, lacking an objective tool for measuring enjoyment and facing diverse influencing factors, have yielded conflicting results on the enjoyment levels of instructional methods.

Purpose: This study aimed to validate the Learning Enjoyment Scale (LES) as an objective tool for measuring students' enjoyment in teaching sessions, and to apply it in evaluating the enjoyment of first-year students in Physiology lectures.

Methods: We developed the Learning Enjoyment Scale (LES) to assess students' enjoyment during learning activities. The scale consists of two sections, each with six items rated on a five-point Likert scale. The first section yields a quantitative value for cross-comparisons between various teaching activities, and its total score is categorized as excellent, acceptable, or low. The second section is employed to evaluate specific factors known to impact the overall enjoyment score. In a cross-sectional study, we applied the LES to 112 first-year medical and dental students immediately following didactic physiology lectures.

Results: The LES demonstrated high reliability (0.914), indicating robust internal consistency among its items. Of all participants, 55% achieved an acceptable total LES score, 40% achieved an excellent score, and 5% received a low score. Enjoyment of physiology lectures exhibited a significant correlation with several factors, including teachers' proficiency, difficulty with the topic, active student participation, fulfillment of objectives, a low level of stress during the activity, and self-perception of acquired skills ($P < 0.001$).

Conclusion: This study underscores the reliability of the Learning Enjoyment Scale (LES) as a valuable tool for assessing teaching activities and analyzing associated factors. The LES revealed that the lectures are well received by undergraduate students, emphasizing their enduring significance as a crucial instructional method in higher education.

Keywords: learning enjoyment, engagement, scale, lecture, active learning, passive learning, teaching

Introduction

Student enjoyment pertains to the sense of pleasure or satisfaction that students derive from the learning process. Enjoyment of a learning activity fosters sustained motivation, enthusiasm, and positive emotions that enhance the overall learning experience.[1,2] This aspect of education is closely intertwined with both student interest and motivation. While these three concepts share connections, they represent distinct dimensions of a student's engagement with learning. Student interest involves the curiosity and attraction that they feel toward a particular subject or activity, whereas motivation encompasses the factors that drive students to dedicate themselves to the learning process.[3] According to the Self-Determination Theory, motivation is enhanced when learners experience autonomy in learning, feeling of competence, and sense of relatedness to other students.[4] Similarly, constructivist theory emphasizes that learning is most

Received: 21 May 2025
Accepted: 5 October 2025
Published: 21 October 2025

engaging when students actively construct knowledge through hands-on activities, real-world problem-solving, and collaborative interaction.[5] This indicates that motivation is dependent on multiple factors that include the learner's psychological needs, personal values, and the social context in which learning occurs. The synergy of enjoyment, interest, and motivation is crucial for the academic achievement of students, as these elements significantly influence student engagement with the overall learning experience.[2–7] This combination contributes to a positive and effective learning atmosphere, fostering not only academic success but also a genuine passion for knowledge.[4,8] While these concepts may overlap, each would play a distinctive role in shaping and enhancing the overall quality of the student's learning experience.

Given the close relationship between motivation and positive learning experiences, student enjoyment can be seen as a complementary driver of engagement, influenced by factors such as teachers' proficiency, students' self-efficacy, and the complexity of the subject matter. This perception drives the ongoing search for more engaging and effective instructional formats, highlighting the need to explore and refine pedagogical strategies that address diverse learning needs. Within this context, lectures remain one of the most scrutinized instructional methods in higher education. Over the past decades, the debate about the effectiveness of didactical lectures has persisted, yielding mixed outcomes that reflect the diverse perspectives among educators and the heterogeneous opinions held by students regarding instructional methods.[9–11] Didactic lectures have often faced criticism for their perceived lack of student enjoyment, primarily stemming from their reliance on passive one-way information delivery.[12–14] In contrast to active learning methodologies such as problem-based learning (PBL) or team-based learning (TBL), students frequently perceive didactic lectures as boring or ineffective.[12–14] In response to these critiques, many educators are adopting a more interactive approach to their lectures. They seek to engage students by incorporating entertaining activities such as real-life scenarios[15] games[16] technology[17] or problem-solving components[18] during lectures. However, despite these efforts, there are no universally clear guidelines on how to organize lectures that are not only educational but also enjoyable. Practical tips and useful recommendations published in Medical Teacher offer valuable strategies to help educators transform didactic lectures into interactive, and effective sessions.[19]

A skilled lecturer possesses the ability to attract the attention of students and enhance their enjoyment through various innovative techniques that include incorporating personal experiences, telling jokes, and sharing relevant stories.[2,20] The impact of such engaging teaching strategies extends beyond mere enjoyment; they have the potential to significantly influence the overall motivation and performance of students. An instructor with an entertaining and effective teaching style can successfully convey information, fostering a positive and dynamic learning environment that may surpass the positive ratings of active learning.[21] In contrast, some instructors may lack the talent to effectively engage and motivate their students, resulting in a potential adverse effect on the students' overall academic performance. However, it is worth noting that Deslauriers et al demonstrated that while students may rate enjoyable lectures positively and even feel they learned more compared to active learning sessions, objective measures showed that actual learning was greater in active learning environments that were perceived lower, indicating that high enjoyment does not necessarily lead to better learning.[22]

The ongoing debate about the effectiveness of teacher-based learning methods (or passive instruction) versus student-based learning methods (or active instruction) is persistent despite the numerous studies conducted over the past decades. The multitude of factors influencing students' enjoyment in both types of instruction could be responsible for the variable preferences or mixed feelings of enjoyment among students. In addition to the educational environment, factors such as teachers' varying skills and experiences and the difficulty level of certain subjects all contribute to and impact the level of enjoyment experienced during a teaching activity.[1,13,14,22] Since enjoyment influences engagement, the present study aimed to develop and validate an objective instrument for systematically measuring students' enjoyment in different pedagogical contexts, and to apply it in evaluating the enjoyment of first-year students in Physiology lectures. This kind of tool would help teachers to examine teaching strategies, identify the origins of differences in student enjoyment, and understand how the same strategies will yield different results when used by different teachers or when applied to different contexts. We sought to apply this scale objectively to measure the enjoyment scores of didactic lectures and investigate associated factors. Through this research, we aim to contribute valuable insights into the dynamics of student enjoyment, offering a tool that explores the factors that influence students' learning experiences.

Methods

Study Design and Participants

In this cross-sectional study, we assessed the enjoyment levels of first-year undergraduate medical and dental students during two physiology lectures. Lectures were delivered by experienced and highly rated professor, followed a didactic format with interactive discussion to encourage student participation and lasted 50 minutes. First-year medical and dental students were chosen to participate in this study because they were newcomers to university health profession education, suggesting that they were unlikely to have developed preferences for specific instructional methods at this early stage. The University Research Ethics Committee granted approval for the study under the reference number "HEC-10-2023/24-F-M." Informed consent was obtained by first providing students with a briefing sheet detailing the study's aims and purpose. Students were informed that their participation was entirely voluntary and would not affect their marks or academic evaluation. They were then asked to sign a consent form confirming that they had read and understood the information and agreed to participate in the study. A total of 112 (68%) students participated in the study, with 32 (out of 47) participants from the dental college and 80 (out of 118) from the medical college. The measuring instrument was distributed to all students immediately following the teaching session.

Data Collection Tool

The Learning Enjoyment Scale (LES) was developed by the investigators as a comprehensive and objective measure of students' enjoyment in the learning process (Figure 1). A brief description of the scale with guidance on its analysis, has been previously published as a data note.[23,24] The scale items are strategically based on the major categories of Bloom's Taxonomy, specifically focusing on cognitive knowledge and affective attitudes. The LES comprises six items: knowledge, comprehension, application, analysis, concentration, and enjoyment. Students are requested to assess each item using a five-point Likert scale, ranging from 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, and 5 = strongly agree). The minimum and maximum total scores across the six items are 6 and 30, respectively. If all responses are agree (ie, Likert scale 4), the total score is 24, representing 80% of the maximum score. Conversely, if all responses are unsure (ie, Likert scale 3), the total score is 18, which accounts for 60% of the maximum score. Consequently, an excellent score is deemed to be above 80% (25–30), an acceptable score falls within the range of 60–80% (18–24), and a low score is defined as less than 60% (< 18). These thresholds facilitate clear interpretation of students' enjoyment levels and are consistent with educational standards for assessing performance and satisfaction in academic settings.

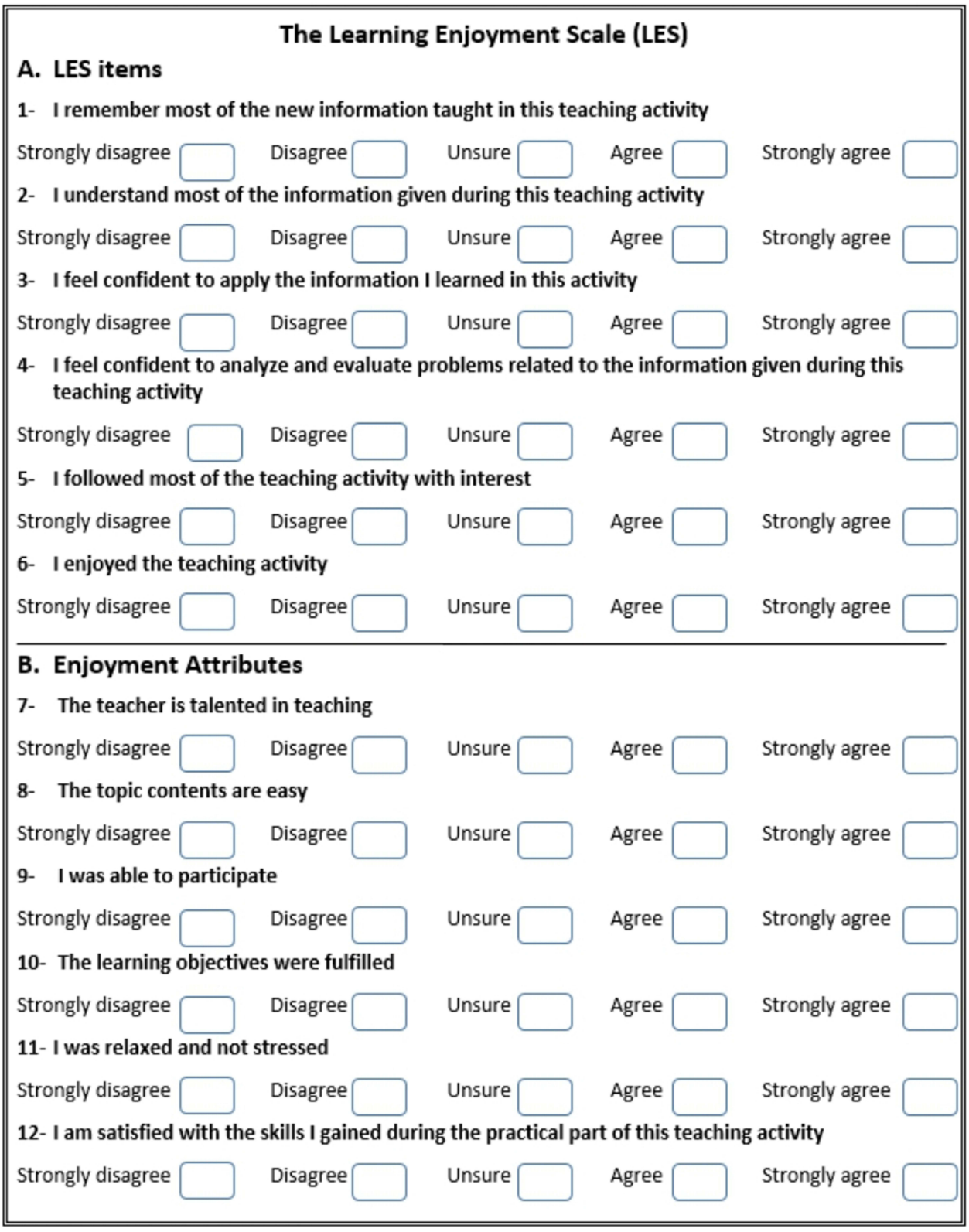
The second section of the scale (enjoyment attributes) assesses the influence of various factors on students' enjoyment. These factors include the teacher's talent, the complexity of the topic, student participation, fulfillment of objectives, perceived stress levels, and the development of skills. The analysis of this section provides detailed understanding of the specific elements that impact students' enjoyment during the learning process.

Data Analysis Plan

The statistical analysis for this study was carried out using the Statistical Package for Social Sciences (SPSS), version 26. Reliability analysis was applied to determine the internal consistency of the Learning Enjoyment Scale (LES) through Cronbach's alpha. The obtained value of Cronbach's alpha was interpreted, with values greater than 0.7 indicating a good level of internal consistency. General tendencies of the Learning Enjoyment Scale items were analyzed using the mean ± SD. The comparisons and associations between LES items or LES attributes and the total score categories were analyzed using the Spearman correlation and the chi-square test with Fisher's exact correction, as appropriate. A p-value of <0.05 was considered statistically significant.

Results

Table 1 displays the items of the Learning Enjoyment Scale (LES), the learning domain assessed by each item and the general tendency of students to respond to each item. According to the Likert scale analysis, the overall tendency of students' responses in this study was "agree". Reliability and validity of the scale were confirmed in this study: internal consistency was excellent, with a Cronbach's Alpha of 0.91. Exploratory Factor Analysis (EFA) supported the theoretical six-domain structure, with the first two components explaining 80.5% of the variance. Inter-item correlations ranged from



The Learning Enjoyment Scale (LES)

A. LES items

1- I remember most of the new information taught in this teaching activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

2- I understand most of the information given during this teaching activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

3- I feel confident to apply the information I learned in this activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

4- I feel confident to analyze and evaluate problems related to the information given during this teaching activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

5- I followed most of the teaching activity with interest

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

6- I enjoyed the teaching activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

B. Enjoyment Attributes

7- The teacher is talented in teaching

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

8- The topic contents are easy

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

9- I was able to participate

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

10- The learning objectives were fulfilled

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

11- I was relaxed and not stressed

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

12- I am satisfied with the skills I gained during the practical part of this teaching activity

Strongly disagree ☐ Disagree ☐ Unsure ☐ Agree ☐ Strongly agree ☐

Figure 1 The Learning Enjoyment Scale. The Learning Enjoyment Scale (LES) is a comprehensive tool developed to assess student enjoyment. (**A**) contains six items measuring perceived learning, confidence, interest, and overall enjoyment. (**B**) contains six items assessing factors influencing enjoyment, such as teacher talent, content difficulty, participation, achievement of objectives, stress levels, and skill satisfaction.

Table 1 General Tendencies of Students' Responses to the Learning Enjoyment Scale Items

Questionnaire Item	Learning Domain	Mean	SD	General Tendency
I remember most of the new information taught in this teaching activity	Recall	3.78	0.877	Agree
I understand most of the information given during this teaching activity	Understanding	4.02	0.816	Agree
I feel confident to apply the information I learned in this activity	Application	3.90	0.890	Agree
I feel confident to analyze and evaluate problems related to the information given during this teaching activity	Analysis	3.79	0.840	Agree
I followed most of the teaching activity with interest	Interest	4.13	0.788	Agree
I enjoyed the teaching activity	Enjoyment	4.15	0.785	Agree

Notes: Cronbach's alpha= 0.914, n= 112.

0.57 to 0.81, indicating meaningful relationships between items. These psychometric properties demonstrate that the LES is a robust and valid instrument for measuring students' enjoyment in learning contexts.

Table 2 shows the relationships of the six items of the LES with the three categories of the total score (Low, Acceptable and Excellent). The table shows a significant relation between the students' responses and the LES categories, with "agree" being the most frequent response and "acceptable" being the major LES category.

Table 2 Examining Students' Responses to Learning Enjoyment Scale Questionnaire Items in Relation to Total Score Categories

Questionnaire Items	Responses	Categories of the Total LES* Score				P
		Acceptable (18–24)	Excellent (≥ 25)	Low (≤ 17)	Total	
1- I remember most of the new information taught in the teaching activity	Agree (n)	42	26	1	69	< 0.001
	Disagree (n)	6	0	2	8	
	Strongly agree (n)	1	15	0	16	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	12	4	0	16	
2- I understand most of the information given during this teaching activity	Agree (n)	51	20	0	71	< 0.001
	Disagree (n)	0	0	3	3	
	Strongly agree (n)	1	25	0	26	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	9	0	0	9	
3- I feel confident to apply the information I learned in this activity	Agree (n)	44	22	0	66	< 0.001
	Disagree (n)	3	0	1	4	
	Strongly agree (n)	1	22	0	23	
	Strongly disagree (n)	0	0	4	4	
	Unsure (n)	13	1	1	15	
4- I feel confident to analyze and evaluate problems related to the information given during this teaching activity	Agree (n)	40	30	1	71	< 0.001
	Disagree (n)	4	0	2	6	
	Strongly agree (n)	1	14	0	15	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	16	1	0	17	
5- I followed most of the teaching activity with interest	Agree (n)	51	15	1	67	< 0.001
	Disagree (n)	0	0	1	1	
	Strongly agree (n)	3	30	1	34	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	7	0	0	7	
6- I enjoyed the teaching activity	Agree (n)	51	15	2	68	< 0.001
	Disagree (n)	0	0	1	1	
	Strongly agree (n)	4	30	0	34	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	6	0	0	6	

Note: * Learning Enjoyment Scale.

https://doi.org/10.2147/AMEP.S539611

Table 3 displays the association between enjoyment attributes and the three categories of the total score. Enjoyment of a learning activity was strongly related to teachers' talent (P< 0.001), difficulty of the topic (P< 0.001), students' active participation during the activity (P< 0.001), fulfillment of the objectives (P< 0.001), low level of stress during the activity (P< 0.001) and self-perception of acquired skills (P< 0.001).

Most dental students (97%) and medical students (95%) showed either acceptable or high enjoyment scores for the Physiology lectures. The difference between students in the two colleges was not statistically significant (Table 4).

Table 5 demonstrates moderate to strong positive Spearman correlations (ρ = 0.35–0.57) between the Total LES Score and all enjoyment attributes, indicating that students with higher LES scores consistently reported more favorable perceptions. The strongest association was observed for "The teacher is talented in teaching" (ρ = 0.57, p < 0.001), suggesting that perceptions of teaching talent are closely aligned with overall enjoyment levels. Other positive correlations further indicate that attributes such as active participation, fulfillment of learning objectives, reduced stress, satisfaction with skills gained, and perceived easiness of topic content also contribute meaningfully to students' enjoyment.

Table 3 Relationships Between Enjoyment Attributes and Categories According to the Total Learning Enjoyment Scale

Attributes	Responses	Categories of the LES* Score				P
		Acceptable (18–24)	Excellent (≥ 25)	Low (≤ 17)	Total	
The teacher is talented in teaching	Agree (n)	41	5	1	47	< 0.001
	Disagree (n)	2	0	0	2	
	Strongly agree (n)	15	39	2	56	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	3	1	0	4	
The topic contents are easy	Agree (n)	28	24	1	53	< 0.001
	Disagree (n)	4	0	0	4	
	Strongly agree (n)	2	7	0	9	
	Strongly disagree (n)	0	0	3	3	
	Unsure (n)	27	14	2	43	
I was able to participate	Agree (n)	39	26	1	66	< 0.001
	Disagree (n)	3	0	1	4	
	Strongly agree (n)	3	14	0	17	
	Strongly disagree (n)	1	0	2	3	
	Unsure (n)	15	5	2	22	
The learning objectives were fulfilled	Agree (n)	44	13	2	59	< 0.001
	Disagree (n)	14	31	0	45	
	Strongly agree (n)	0	0	3	3	
	Strongly disagree (n)	3	1	1	5	
	Unsure (n)	44	13	2	59	
I was relaxed and not stressed	Agree (n)	38	20	1	59	< 0.001
	Disagree (n)	1	1	2	4	
	Strongly agree (n)	7	21	1	29	
	Strongly disagree (n)	1	0	2	3	
	Unsure (n)	14	3	0	17	
I am satisfied with the skills I gained during the practical part of this activity	Agree (n)	41	23	1	65	< 0.001
	Disagree (n)	0	0	1	1	
	Strongly agree (n)	11	21	1	33	
	Strongly disagree (n)	0	0	2	2	
	Unsure (n)	9	1	1	11	

Note: *Learning Enjoyment Scale.

Table 4 Comparison of the Total Learning Enjoyment Scale Scores of Dental and Medical Students

	Learning Enjoyment Scale Categories			Total
	Acceptable (18–24)	Excellent (≥ 25)	Low (≤ 17)	
Dental students n (%)	14 (44)	17 (53)	1 (3)	32 (100)
Medical students n (%)	47 (59)	28 (35)	5 (6)	80
Total n (%)	61 (55)	45 (40)	6 (5)	112

Note: P= 0.199.

Table 5 Spearman Correlation Between Total Learning Enjoyment Score and Enjoyment Attributes

Enjoyment Attribute	Spearman rho	p-Value
The teacher is talented in teaching.	0.57	< 0.001
The topic contents are easy.	0.35	< 0.001
I was able to participate.	0.51	< 0.001
The learning objectives were fulfilled.	0.54	< 0.001
I was relaxed and not stressed.	0.46	< 0.001
I am satisfied with the skills I gained during the practical part of this activity.	0.48	< 0.001

Discussion

Enjoyment can be defined as a positive emotional response to learning experiences, characterized by interest, engagement, and satisfaction, which can coexist with the pursuit of academic excellence.[25] Because it is a subjective feeling, there is currently no universally accepted instrument for its assessment. Researchers have employed a variety of approaches, including single-question ratings (eg, on a scale from 0 to 6),[26] satisfaction questionnaires with open-ended items,[27,28] adapted items from the Achievement Emotions Questionnaire,[29] and researcher-designed questionnaires based on enjoyment indicators.[30] While these methods provide useful insights, they vary widely in scope, depth, and focus, highlighting the need for a more structured and comprehensive tool that captures multiple dimensions of enjoyment and links them to specific aspects of the learning experience.

The Learning Enjoyment Scale (LES) employed in this study was developed by researchers to directly measure students' enjoyment following various types of teaching activities. In developing this scale, a direct question about enjoyment was incorporated, alongside additional items assessing students' perceptions of various learning domains (knowledge, comprehension, application, and analysis) which are recognized to influence enjoyment. The scale reflects students' satisfaction and self-perception of the knowledge acquired during the completed teaching activity. The psychometric properties, including excellent internal consistency (Cronbach's Alpha = 0.91), strong inter-item correlations (ranging from 0.57 to 0.81), and support for the theoretical six-domain structure through Exploratory Factor Analysis (explaining 80.5% of the variance), confirm that the LES is a reliable and valid tool for measuring students' enjoyment in learning contexts. A test–retest reliability is planned for future research to further validate the scale. The LES items are grounded in the major categories of Bloom's Taxonomy, encompassing cognitive knowledge and affective attitude, while the psychomotor domain is partially addressed in the second section of the scale. Broadly, the scale evaluates students' perceptions of knowledge, comprehension, application, analysis, interest, and enjoyment attained during the teaching activity. The calculated total LES provides a quantitative value for comparisons across different teaching activities and is categorized as excellent, acceptable, or low. Our findings revealed a significant relationship between students' responses to the questionnaire items and LES score categories, with "Agree" emerging as the most frequent response and "Acceptable" being the predominant category.

The second section of the LES is excluded from the score calculation but plays a crucial role in assessing specific factors known to influence the overall enjoyment score. This section evaluates key elements impacting enjoyment,

including the teacher's proficiency, the complexity of the topic, active student participation, alignment with learning objectives, perceived stress during the teaching activity, and skill development. Our study demonstrated a significant association between these enjoyment attributes and the total LES score for Physiology lectures. The findings affirm that these factors collectively contribute to the study's acceptable LES score. Notably, didactic lectures are well received by students when these factors are effectively considered and addressed. It is essential to highlight that these factors, such as teachers' talent and skills in teaching, are often overlooked in comparisons of teaching methods' effectiveness, including a large number of studies that praise problem-based learning and team-based learning pedagogy for being superior to lectures in many educational aspects, including enjoyment.[12–14] It is obvious that lectures can be engaging and enjoyable when presented by a talented faculty member and, conversely, uninteresting and ineffective when delivered by a faculty member lacking in presentation skills.

It is not surprising that the conclusion asserting that lectures are old teaching methods focused solely on simple transfer of information to passive listeners has been controversial for decades, as it overlooks the outcomes of interesting lectures delivered by expert talented professors who know how to draw the attention of their students through various interventions, such as stories, past experiences, gestures, a sense of humor, facial expressions, stimulating questions and purposeful movements.[13,31,32] In the absence of an objective tool for evaluation, we can claim that lectures described as ineffective might be just boring due to lack of experience or deficient skills of the presenting instructors. This perception often leads educators to undermine the role of lectures in efficiently conveying vital information to a large audience within a limited timeframe, thus favoring student-centered teaching methods that require minimal instructor input. Our assumption is supported by numerous studies indicating that didactic lectures are effective, or even superior to, alternative teaching methods.[12–14] Additionally, lectures delivered with a sense of humor and teacher's enthusiasm are not only enjoyable but also more likely to be attended by students.[31,32] This underscores the importance of our proposed Learning Enjoyment Scale and its attributes, providing an objective means of measuring students' enjoyment and facilitating comparisons across various teaching activities.

Given that the majority of our students expressed agreement and satisfaction with all the enjoyment attributes outlined in the questionnaire, especially the teacher's talent, the anticipated significant relationship with an acceptable total LES score was validated. However, a previous study showed that although students reported a high enjoyment level of lectures delivered by experienced and highly appraised professors, the actual learning was less than expected.[22] Similarly, while activities such as academic games can be more enjoyable and motivating than didactic lectures,[33] evidence indicates that knowledge retention from such games is often comparable to, or even lower than, that achieved through traditional lectures.[34,35] These findings suggest that factors other than enjoyment may play a more significant role in promoting effective learning.

Students might find enjoyment in didactic lectures because they can passively absorb information without the stress of demonstrating their understanding or skills. It is widely recognized that students may shy away from active participation in class due to anxiety or fear of judgment from their peers or instructors. Encouraging student participation without inducing stress fosters active engagement and promotes effective learning.[36] Even seemingly simple interventions, such as incorporating games, problems or humor, have been shown to reduce stress and enhance enjoyment.[16,18,37] Our findings align with this perspective, revealing a low perceived stress level during Physiology lectures. In contrast to more challenging subjects which may be less enjoyable, subjects such as Physiology, which are perceived as easier, are associated with lower stress levels. This is likely due to clarity, organization, and reduced demand for intense attention and deep thinking, which are factors that may contribute to a more conducive learning environment.

Several limitations must be considered when interpreting the results of this study. First, the study focused exclusively on first-year students, whose perceptions may differ from those of students in later years. Additionally, with a response rate of 68%, the impact of nonparticipating students' perspectives on the results remains uncertain. Furthermore, the self-reported measure introduces the possibility of response bias. Moreover, the evaluation of enjoyment was conducted immediately after lectures, without assessing long-term knowledge retention. Finally, the developed LES was specifically applied to Physiology lectures within a single university in the UAE. Its generalizability and effectiveness should be

further explored by applying it to other subjects, different teaching methods, and diverse geographic locations. This broader application would enhance the scale's validity and provide a more comprehensive understanding of its utility in various educational contexts.

Conclusions

This study confirms that the Learning Enjoyment Scale (LES) is a reliable and valid tool for assessing students' enjoyment across didactic lectures, demonstrating excellent internal consistency (Cronbach's $\alpha = 0.91$) and strong construct validity. Applied to undergraduate physiology lectures, the LES revealed that most students reported acceptable or high enjoyment levels, with no significant differences between medical and dental students. Enjoyment was most strongly associated with perceptions of the teacher's talent, followed by active participation, fulfillment of learning objectives, reduced stress, satisfaction with skills gained, and perceived ease of content. Future research should explore the application of the LES in evaluating different instructional methods, its potential to predict learning outcomes, and its applicability across diverse disciplines and learning environments.

Data Sharing Statement

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of RAK Medical and Health Sciences University, UAE (Approval No. HEC-10-2023/24-F-M), and followed the guidelines of the Declaration of Helsinki of the World Medical Association. Informed consent was obtained from all participants involved in the study.

Acknowledgments

The authors express their thanks to the students who participated in this study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

The authors declare that they did not receive any funding towards this study.

Disclosure

The authors declare no competing interests.

References

1. Gifford H, Varatharaj A. The ELEPHANT criteria in medical education: can medical education be fun? *Med Teach*. 2010;32(3):195–197. doi:10.3109/01421591003614866
2. Kromka M, Goodboy AK. Classroom storytelling: using instructor narratives to increase student recall, affect, and attention. *Commun Educ*. 2019;68(1):20–43. doi:10.1080/03634523.2018.1529330
3. Abdel Meguid EM, Smith CF, Meyer AJ. Examining the motivation of health profession students to study human anatomy. *Anatomical Sci Educ*. 2020;13(3):343–352. doi:10.1002/ase.1919
4. Deci EL, Ryan RM. Self-determination theory: a macrotheory of human motivation, development, and health. *Can Psychol*. 2008;49(3):182–185. doi:10.1037/a0012801
5. Tam M. Constructivism, instructional design, and technology: implications for transforming distance learning. *J Educ TechnolSoc*. 2000;3(2):50–60.
6. Kassab SE, Taylor D, Hamdy H. Student engagement in health professions education. *AMEE Guide No 152 Med Teach*. 2023;45(9):949–965. doi:10.1080/0142159X.2022.2137018

7. Maia D, Andrade R, Afonso J, Costa P, Valente C, Espregueira-Mendes J. Academic performance and perceptions of undergraduate medical students in case-based learning compared to other teaching strategies: a systematic review with meta-analysis. *Educ Sci*. 2023;13(3):238. doi:10.3390/educsci13030238
8. Harackiewicz JM, Smith JL, Priniski SJ. Interest Matters: the Importance of Promoting Interest in Education. *Policy Insights Behav Brain Sci*. 2016;3(2):220–227. doi:10.1177/2372732216655542
9. Fatima S. Teacher Centered Versus Student Centered Strategies for Undergraduate Students. *Pak Armed Forces Med J*. 2022;72(2):604–607. doi:10.51253/pafmj.v72i2.3723
10. Johnston JM, Schooling CM, Leung GM. A randomized-controlled trial of two educational modes for undergraduate evidence-based medicine learning in Asia. *BMC Med Educ*. 2009;9(1):63. doi:10.1186/1472-6920-9-63
11. Malhotra P, Khati C. Comparison of didactic lecture versus student led seminar as a tool for teaching- learning activity in anundergraduate Indian medical college. *Australasian Med J*. 2013;6(4):216.
12. Alamoudi AA, Al Shawwa LA, Gad H, Tekian A. Team-based learning versus traditional didactic lectures in teaching clinical biochemistry at King Abdulaziz University; learning outcomes and student satisfaction. *Biochem Mol Biol Educ*. 2021;49(4):546–559. doi:10.1002/bmb.21501
13. Susanto T, Rasni H, Susumaningrum LA, Adi Yunanto R. The Comparing of Problem-Based Learning and Lecture-Based Learning on Students' Learning Outcomes and Satisfaction for a Family Health Nursing Course. *J Keperawatan Padjadjaran*. 2022;10(2):134–139. doi:10.24198/jkp.v10i2.2037
14. Imran M, Halawa TF, Baig M, Almanjoumi AM, Badri MM, Alghamdi WA. Team-based learning versus interactive lecture in achieving learning outcomes and improving clinical reasoning skills: a randomized crossover study. *BMC Med Educ*. 2022;22(1):348. doi:10.1186/s12909-022-03411-w
15. Narayanan SN, Merghani TH. Real-life scenario blended teaching approach for nurturing inquisitive learning of central nervous system in medical students. *Adv Physiol Educ*. 2023;47(1):124–138. doi:10.1152/advan.00054.2022
16. Narayanan SN, Ahmed I, Saherawala B, Foud F, Merghani TH. Appraisal of a novel pedagogical approach to demonstrating neuromuscular transmission to medical students. *Adv Physiol Educ*. 2021;45(3):580–588. doi:10.1152/advan.00221.2020
17. Premkumar K, Coupal C. Rules of engagement-12 tips for successful use of "clickers" in the classroom. *Med Teach*. 2008;30(2):146–149. doi:10.1080/01421590801965111
18. Alaagib NA, Musa OA, Saeed AM. Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. *BMC Med Educ*. 2019;19(1):365. doi:10.1186/s12909-019-1799-0
19. Malik AS, Malik RH. Twelve tips for effective lecturing in a PBL curriculum. *Med Teach*. 2012;34(3):198–204. doi:10.3109/0142159X.2011.588741
20. Alias M, Suhaizal H, Affero I. Integration of the humor approach with student's engagement in teaching and learning sessions. *J Educ Teach*. 2019;45(2):228–233. doi:10.1080/02607476.2018.1548169
21. Carpenter SK, Northern PE, Tauber SU, Toftness AR. Effects of lecture fluency and instructor experience on students' judgments of learning, test scores, and evaluations of instructors. *J Exp Psychol Appl*. 2020;26(1):26–39. doi:10.1037/xap0000234
22. Deslauriers L, McCarty LS, Miller K, Callaghan K, Kestin G. Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom. *Proc Natl Acad Sci U S A*. 2019;116(39):19251–19257. doi:10.1073/pnas.1821936116
23. Merghani T, Babiker R, Alawad A. Development and application of a learning enjoyment scale for pedagogical activities. *Zenodo*. 2024;13:273. doi:10.5281/zenodo.10526239
24. Merghani TH, Babiker R, Alawad A. Development and application of a learning enjoyment scale for pedagogical activities. *F1000Research*. 2024;13:273. doi:10.12688/f1000research.147393.1
25. Hartley D. Excellence and enjoyment: the logic of a 'contradiction'. *British J Edu Stud*. 2006;54(1):3–14. doi:10.1111/j.1467-8527.2005.00331.x
26. Griffee DT. Connecting Theory to Practice: evaluating a Brain-based Writing Curriculum. *Learning Assistance Rev*. 2007;12(1):17–27.
27. Marín-Vinuesa LM, Rojas-García P. Expected Usefulness of Interactive Learning Platforms and Academic Sustainability Performance: the Moderator Role of Student Enjoyment. *Sustainability*. 2024;16(9):3630. doi:10.3390/su16093630
28. Dehghan S, Horan EM, Frome G. Investigating the Impact of the Flipped Classroom on Student Learning and Enjoyment in an Organic Chemistry Course. *J Chem Educ*. 2022;99(7):2512–2519. doi:10.1021/acs.jchemed.1c01104
29. Bieleke M, Gogol K, Goetz T, Daniels L, Pekrun R. The AEQ-S: a short version of the achievement emotions questionnaire. *Contemp Educ Psychol*. 2021;65:101940. doi:10.1016/j.cedpsych.2020.101940
30. Mirawati M, Sikarni W. Description of Student Attitudes: enjoyment in Learning Physics and Interest in More Time Studying Physics. *Sch J Phs Ed*. 2023;4(1):1–6. doi:10.37251/sjpe.v4i1.490
31. Frenzel AC, Taxer JL, Schwab C, Kuhbandner C. Independent and joint effects of teacher enthusiasm and motivation on student motivation and experiences: a field experiment. *Motivation Emotion*. 2018;43(2):255–265. doi:10.1007/s11031-018-9738-7
32. Bieg S, Dresel M, Goetz T, Nett UE. Teachers' enthusiasm and humor and its' lagged relationships with students' enjoyment and boredom - A latent trait-state-approach. *Learn Instruction*. 2022;81:101579. doi:10.1016/j.learninstruc.2021.101579
33. Shiroma PR, Massa AA, Alarcon RD. Using game format to teach psychopharmacology to medical students. *Med Teach*. 2011;33(2):156–160. doi:10.3109/0142159X.2010.509414
34. Trevino R, Majcher C, Rabin J, Kent T, Maki Y, Wingert T. The Effectiveness of an Educational Game for Teaching Optometry Students Basic and Applied Science. *PLoS One*. 2016;11(5):e0156389. doi:10.1371/journal.pone.0156389
35. Rondon S, Sassi FC, Furquim de Andrade CR. Computer game-based and traditional learning method: a comparison regarding students' knowledge retention. *BMC Med Educ*. 2013;13:30. doi:10.1186/1472-6920-13-30
36. Azer SA. Student engagement in health professions education: a commentary on AMEE Guide No. 152. *Med Teach*. 2023;45(11):1198–1202. doi:10.1080/0142159X.2023.2198095
37. Bartzik M, Bentrup A, Hill S, et al. Care for Joy: evaluation of a Humor Intervention and Its Effects on Stress, Flow Experience, Work Enjoyment, and Meaningfulness of Work. *Front Public Health*. 2021;9:667821. doi:10.3389/fpubh.2021.667821