

Homogeneización de clases y materiales en diferentes unidades docentes en obstetricia y ginecología: un estudio cuasi-experimental

Homogenization of lessons and materials in different teaching units in obstetrics and gynecology: a quasi-experimental study

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Resumen

Objetivo: Evaluar el impacto de la estandarización de las clases y materiales en diferentes unidades docentes de obstetricia y ginecología sobre la satisfacción de los estudiantes, la percepción de la adecuación en la preparación para los exámenes y la necesidad de estandarización del contenido.

Métodos: Se llevó a cabo un estudio cuasi-experimental durante dos semestres con estudiantes de cuarto año de medicina. En el primer semestre, los docentes de cuatro unidades docentes diseñaron sus propias clases y materiales de manera independiente. En el segundo semestre, se implementaron materiales didácticos estandarizados en todas las unidades. Se evaluaron las percepciones de los estudiantes mediante encuestas que midieron la relevancia del contenido, la satisfacción, la adecuación de la preparación para los exámenes y las discrepancias percibidas en los materiales de enseñanza. **Resultados:** Un total de 180 estudiantes participaron en el primer semestre y 184 en el segundo. Los estudiantes del primer semestre, en el que los docentes tenían autonomía, reportaron una mayor satisfacción y mejor percepción de la adecuación de la preparación para los exámenes (80.0 vs. 72.5, $p < 0.001$). El porcentaje de estudiantes que percibieron discrepancias en los materiales de enseñanza disminuyó tras la estandarización (63.3% vs. 57.6%, $p = 0.264$). Sin embargo, la proporción de estudiantes que consideraron necesaria la estandarización del contenido se redujo significativamente (94.4% vs. 57.1%, $p < 0.001$). Además, nueve estudiantes en el segundo semestre calificaron su satisfacción por debajo de 5, en comparación con ninguno en el primer semestre ($p = 0.004$). **Conclusiones:** El estudio sugiere que, si bien la estandarización mejora la consistencia del contenido, puede reducir la satisfacción de los estudiantes y la percepción de una adecuada preparación para los exámenes. Un modelo de estandarización rígido puede no abordar completamente las necesidades de aprendizaje de los estudiantes. Un enfoque híbrido, que combine la estandarización con la autonomía docente, podría optimizar los resultados educativos en la formación médica.

Palabras clave: educación médica, homogeneización curricular, retroalimentación de los estudiantes, unidades docentes, resultados docentes.

Abstract

Objective: To evaluate the impact of standardizing lessons and materials across different teaching units in obstetrics and gynecology on students' satisfaction, perceived exam preparation adequacy, and the necessity for content standardization. **Methods:** A quasi-experimental study was conducted over two semesters with fourth-year medical students. In the first semester, faculty members from

four teaching units independently designed their lessons and materials. In the second semester, standardized teaching materials were implemented across all units. Student perceptions were assessed through surveys measuring content relevance, satisfaction, exam preparation adequacy, and perceived discrepancies in teaching materials. **Results:** A total of 180 students participated in the first semester, and 184 in the second semester. Students in the first semester, where faculty had autonomy, reported higher satisfaction and a better perception of exam preparation adequacy (80.0 vs. 72.5, $p < 0.001$). The percentage of students perceiving discrepancies in teaching materials decreased after standardization (63.3% vs. 57.6%, $p = 0.264$). However, the proportion of students considering standardization necessary declined significantly (94.4% vs. 57.1%, $p < 0.001$). Additionally, nine students in the second semester rated satisfaction below 5, compared to none in the first semester ($p = 0.004$). **Conclusions:** The study suggests that while standardization improves content consistency, it may reduce student satisfaction and perceived exam preparation adequacy. A rigid standardization model may not fully address students' learning needs. A hybrid approach, balancing standardization with faculty autonomy, could optimize educational outcomes in medical training.

Keywords: medical education, curriculum homogenization, student feedback, teaching units, educational outcomes.

1. Introduction

As the demand for training new physicians grows, universities increasingly collaborate with multiple hospitals and teaching units simultaneously. This expanded network allows for a broader range of clinical experiences and expertise to be shared with students. However, this arrangement often leads to a common complaint among students regarding inconsistencies in the theoretical content delivered across different units. Students frequently express concerns that variations in teaching methods and materials can result in unequal educational experiences, potentially impacting their overall learning and preparedness (1). These discrepancies underscore the challenge of maintaining a standardized curriculum while leveraging the diverse strengths of various teaching sites (2-3).

Student's satisfaction in medical education can be influenced by a variety of factors, ranging from the quality and relevance of course content to the teaching methods employed by faculty (4). In medical schools, the structure and delivery of lessons play a crucial role in shaping students' learning experiences (5). Factors such as the alignment of lecture material with clinical practice, the clarity and organization of presentations, and the availability of supporting resources can significantly impact how students perceive their education. Moreover, the adequacy of exam preparation provided through these lessons is a critical component, as it directly affects students' confidence and performance (6-7).

The creativity of medical teachers in delivering theoretical content is particularly important. Engaging teaching methods, such as the use of real-life case studies, interactive discussions, and multimedia resources, can enhance students' understanding and retention of complex medical concepts (8). Creative approaches not only make the material more interesting, but also encourage critical thinking and problem-solving skills, which are vital for future medical practitioners (9).

This study aims to analyze whether standardizing teaching materials across different teaching units improves medical students' perceptions of their educational experience. To investigate this, student perceptions were studied during two semesters of the obstetrics and gynecology course, with one of the semesters implementing standardized materials across four teaching units.

2. Methods

This is a quasi-experimental study in which survey results were compared among fourth-year medical students studying obstetrics and gynecology. In the first semester, students from four different teaching units received lessons where each faculty member designed their own content. In the second semester, the content and materials were standardized across all four teaching units.

Standardization involved the development of identical presentations and scripts for each topic across the different teaching units, with each presentation approved by all faculty members. Additionally, the correct answers to the exam questions were required to be included in the

presentations. The examination, both in obstetrics and gynecology, consisted of a multiple-choice test with four options and a single correct answer.

Data were collected through standardized surveys that were distributed to the fourth-year medical students following their obstetrics and gynecology lessons after the first and second semesters of the 2023-24 academic year. The standardization of the surveys was carried out through meetings and consensus by the faculty of the course, which comprises a total of 16 professors. Student participation was voluntary, anonymous, and based on prior informed consent. The study received approval from the institutional board.

The surveys included questions on the relevance of the course content (rated on a scale from 0 to 10), the perception of exam preparation adequacy (rated on a scale from 0 to 100), perceived discrepancies in teaching materials, satisfaction with the course content (rated on a scale from 0 to 10), and the need for content standardization. The number of students who took the exam each semester and the number of students who passed each semester were also recorded.

Statistical analyses

The distribution of variables was assessed using the Shapiro-Wilk test and visual inspection of histograms. Numerical variables were expressed as medians with interquartile ranges (IQR), while qualitative variables were reported as proportions, including both absolute and relative frequencies. Group comparisons were conducted using the Mann-Whitney U-test, Kruskal-Wallis test, two-tailed χ^2 -test, or two-tailed Fisher's exact test, as appropriate. The significance level was set at 0.05 for comparisons between two groups and at 0.0125 for multiple comparisons (among four groups). All analyses were performed using SPSS version 22.0 (SPSS Inc., Chicago, IL, USA).

3. Results.

A total of 210 fourth-year medical students were enrolled in the Obstetrics and Gynecology course. Of these, 180 (85.7%) students participated in the first semester and 184 (87.6%) participated in the second semester ($P = 0.566$). The responses were evenly distributed across the four teaching units/hospitals involved in the study. In the first semester, 49 (27.2%) students were from Unit 1, 45 (25.0%) from Unit 2, 48 (26.7%) from Unit 3, and 38 (21.1%) from Unit 4. In the second semester, the distribution was 52 (28.3%) students from Unit 1, 44 (23.9%) from Unit 2, 46 (25.0%) from Unit 3, and 42 (22.8%) from Unit 4 ($P = 0.960$).

In the first semester, the ratings for course content relevance and interest were 8.0 (8.0; 9.0) points. The perception of exam preparation adequacy was rated at 80.0 (75.0; 90.0). Additionally, 114 (63.3%) students reported discrepancies in teaching materials between units. Overall satisfaction was rated at 8.0 (7.0; 9.0) points. Notably, 170 (94.4%) students considered it necessary to standardize the teaching materials across different units.

During the second semester, standardized teaching materials were introduced. All 184 students responded to the surveys. The ratings for content relevance and interest were at 8.0 (7.0; 9.0). The adequacy of exam preparation was rated at 72.5 (60.0; 85.0). A total of 106 (57.6%) students reported discrepancies. Satisfaction scores were 8.0 (7.0; 9.0) points, while 105 (57.1%) students felt that standardization of content was necessary.

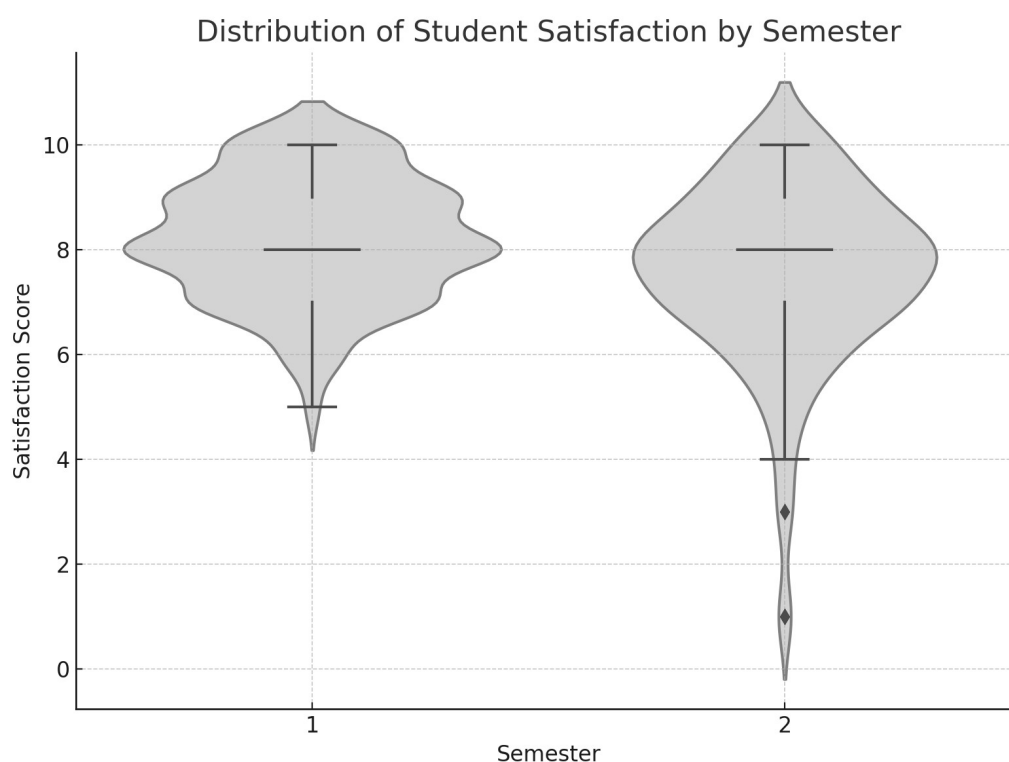
Comparing the two semesters, significant differences were observed in the adequacy of exam preparation, overall satisfaction, and the perceived need for standardized content (table 1). Notably, nine students rated satisfaction below 5 in the second semester, compared to none in the first semester.

Despite similar central tendencies, students in the second semester reported a generally higher level of satisfaction with the course. Both semesters showed identical median satisfaction scores and interquartile ranges; however, the overall distribution of responses differed significantly. A combined violin and boxplot revealed a greater concentration of higher satisfaction scores in the second semester (figure 1).

Table 1. Results and comparison of surveys conducted in the first and second semester.

	First semester (n=180)	Second semester (n=184)	P-value
Content relevance and interest rating	8.0 (8.0; 9.0)	8.0 (7.0; 9.0)	0.063
Adequacy of exam preparation rating	80.0 (75.0; 90.0)	72.5 (60.0; 85.0)	<0.001
Reported discrepancies	114 (63.3%)	106 (57.6%)	0.264
Satisfaction score	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	<0.001
Satisfaction score < 5	0 (0%)	9 (4.9%)	0.004
Think standardization is necessary	170 (94.4%)	105 (57.1%)	<0.001

Data are presented as medians (interquartile range), and absolute and relative frequencies for qualitative variables.

**Figure 1.** Comparison of student satisfaction scores using violin and boxplot visualization.

Significant differences were observed among the teaching units regarding the adequacy of exam preparation in the first semester and the perception of discrepancies in teaching materials between units, as well as the need for content standardization in the second semester (table 2).

In the first semester, 201 students (95.7%) took the exam, compared to 196 students (93.3%) in the second semester ($P = 0.284$). Among those who took the exam, 182 students (90.5%) passed in the first semester, and 174 students (88.8%) passed in the second semester ($P = 0.562$).

Table 2. Results and comparison of surveys of the 4 teaching units.

Teaching unit	I	II	III	IV	P-value
First semester	N= 49	N= 45	N= 48	N= 38	
Content relevance and interest rating	8.0 (7.0; 9.0)	9.0 (8.0; 9.5)	8.0 (8.0; 9.0)	8.0 (7.0; 9.0)	0.055
Adequacy of exam preparation rating	80.0 (70.0; 85.0)	85.0 (77.5; 90.0)	80.0 (75.0; 90.0)	80.0 (80.0; 90.0)	0.010
Reported discrepancies	35 (71.4%)	28 (62.2%)	30 (62.5%)	21 (55.3%)	0.478
Satisfaction score	8.0 (7.0; 9.0)	9.0 (8.0; 9.5)	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	0.062
Think standardization is necessary	45 (91.8%)	44 (97.8%)	46 (95.8%)	35 (92.1%)	0.540
Second semester	N= 52	N= 44	N= 46	N= 42	
Content relevance and interest rating	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	0.294
Adequacy of exam preparation rating	70.0 (60.0; 80.0)	70.0 (60.0; 80.0)	77.5 (70.0; 85.0)	80.0 (70.0; 85.0)	0.032
Reported discrepancies	42 (80.8%)	26 (59.1%)	21 (45.7%)	17 (40.5%)	0.002
Satisfaction score	8.0 (6.5; 8.0)	8.0 (6.5; 9.0)	8.0 (7.0; 9.0)	8.0 (7.0; 9.0)	0.354
Think standardization is necessary	22 (42.3%)	21 (47.7%)	31 (67.4%)	31 (73.8%)	0.005

Data are presented as medians (interquartile range), and absolute and relative frequencies for qualitative variables.

Discussion

The primary goal of standardizing educational content is to ensure consistency in the quality of education across different teaching sites. However, if standardization results in a reduction of faculty autonomy, the outcomes can be counterproductive, as shown in our study. The ability to adapt theoretical content to suit the needs of students and the unique context of each teaching environment is crucial in medical education (10). Faculty autonomy allows instructors to tailor their teaching methods and materials, thereby enhancing the relevance and effectiveness of the curriculum. This flexibility is vital for addressing diverse learning styles and promoting a more engaging and dynamic educational experience (8).

In our study, we were surprised by the poorer outcomes in the perceived adequacy of exam preparation following the standardization of content, despite the fact that there were no differences in the proportion of students who took the exam or in the pass rates between semesters. We initially believed that standardizing the materials would be particularly beneficial in ensuring that all students received the same foundational knowledge, thereby making it easier for them to prepare for exams. However, as observed in the study, the standardization of materials led to a decline in students' perception of exam preparation adequacy. These results prompted us to reconsider our approach, highlighting the effectiveness of teaching methods like flipped classrooms, which, despite being contrary to the idea of content standardization, have shown to be more effective.¹¹ Moreover, standardization may limit direct dialogue between faculty and students, which is one of the most

important aspects in improving teaching skills (12).

The findings related to the perceived need for standardizing materials and lessons were particularly interesting. After the standardization experience, a notable proportion of students changed their views, although more than 50% still felt that standardization was necessary. We believe this continued support for standardization may stem from a lack of exposure to alternative teaching techniques and models (13-14). If students and instructors had more opportunities to explore and experience different educational approaches, the perceived need for uniformity might decrease. This suggests that introducing diverse teaching methods and providing training on innovative educational practices could help students and faculty appreciate the benefits of varied instructional methods, potentially reducing the perceived necessity for homogenization. On the other hand, the substantial percentage of students who continued to support standardization may reflect a desire for consistency and fairness in assessment across units. Even when drawbacks are perceived, standardization may be seen as a structural safeguard in distributed learning environments (3).

There were some results that initially appeared contradictory. Although the standardization of materials aimed to reduce inconsistencies, the difference in perceived discrepancies between semesters was not significant, suggesting that content uniformity alone may not resolve students' concerns about variability, which can also stem from teaching styles and context (2). Notably, a subgroup of students expressed markedly low satisfaction after standardization, highlighting that rigid approaches may negatively affect learners who benefit from more adaptive, interactive instruction (8). As a potential solution, a hybrid model could offer the advantages of both consistency and pedagogical flexibility. This might involve the development of a standardized, faculty-approved textbook or core set of materials to ensure foundational alignment across units, combined with interactive teaching sessions that build on this content using innovative strategies such as flipped classrooms, case-based learning, or gamified formats. Such an approach would preserve content consistency while allowing educators to engage students through varied, learner-centered methodologies (11).

Regarding the strengths of our study, a notable advantage is that it was conducted with the same students and faculty members throughout both semesters. This consistency helped maintain uniformity in personalities and individual capacities for teaching and learning, thus minimizing potential biases that might arise if different groups had been used for a parallel study comparing two teaching techniques. Another strength lies in the study's reproducibility; similar results across the four teaching units suggest a robust and consistent outcome.

In terms of limitations, this study presents some methodological constraints. First, the academic content differed between the two semesters, as each covered distinct thematic blocks within the Obstetrics and Gynecology curriculum. Although the course structure, duration, and faculty remained constant, variations in topic complexity or relevance may have influenced students' perceptions. Second, the absence of a qualitative component limits a deeper understanding of the reasons behind the lower satisfaction reported in the standardized semester. Open-ended survey items or interviews could have provided valuable insights and should be considered in future studies. Third, the quasi-experimental design without random assignment introduces potential confounding factors, as students were grouped by semester for practical reasons. However, we believe these limitations were partially mitigated by the large sample size, the balanced distribution of students across teaching units, the consistent teaching framework, and the standardized survey instrument applied uniformly across both cohorts.

Conclusions

- Our study demonstrates the challenges associated with standardizing teaching materials in medical education. Standardization offers consistency and fairness in delivering essential knowledge, which is crucial for maintaining educational quality across different teaching units. However, it also raises concerns about diminishing student engagement and limiting faculty autonomy.
- The findings underscore the need for a hybrid curriculum model that combines standardized core content with the flexibility for faculty to adapt and personalize their teaching methods. Achieving a balance between standardization and flexibility is crucial for effectively preparing students for the complexities of medical practice.

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References

1. Fernández-Rodríguez CA, Arenas-Fenollar MC, Lacruz-Pérez I, Tárraga-Mínguez R. Teaching Methods in Medical Education: An Analysis of the Assessments and Preferences of Students. *Sustainability*. **2023**; 15(11): 9044. <https://doi.org/10.3390/su15119044>
2. Barber JRG, Park SE, Jensen K, et al. Facilitators and barriers to teaching undergraduate medical students in general practice. *Med Educ*. **2019**; 53. <https://doi.org/10.1111/medu.13882>
3. Law M, Veinot P, Mylopoulos M, Bryden P, Brydges R. Applying activity theory to undergraduate medical curriculum reform: Lessons in contradictions from multiple stakeholders' perspectives. *Med Teach*. **2022**; 44. <https://doi.org/10.1080/0142159X.2022.2041190>
4. Neufeld A, Malin G. Exploring the relationship between medical student basic psychological need satisfaction, resilience, and well-being: A quantitative study. *BMC Med Educ*. **2019**; 19. <https://doi.org/10.1186/s12909-019-1847-9>
5. Bacro TRH, Gebregziabher M, Fitzharris TP. Evaluation of a lecture recording system in a medical curriculum. *Anat Sci Educ*. **2010**; 3. <https://doi.org/10.1002/ase.183>
6. Khanna P, Roberts C, Lane AS. Designing health professional education curricula using systems thinking perspectives. *BMC Med Educ*. **2021**; 21. <https://doi.org/10.1186/s12909-020-02442-5>
7. Khalil MK, Wright WS, Spearman KA, Gaspard AC. Relationship between students' perceptions of the adequacy of M1 and M2 curricula and their performance on USMLE step 1 examination. *BMC Med Educ*. **2019**; 19. <https://doi.org/10.1186/s12909-019-1796-3>
8. Kopel J, Brower G, Culberson JW. Teaching methods fostering enjoyment and creativity in medical education. *J Community Hosp Intern Med Perspect*. **2021**; 11. <https://doi.org/10.1080/20009666.2021.1979739>
9. Green MJ, Myers K, Watson K, Czerwicz M, Shapiro D, Draus S. Creativity in Medical Education: The Value of Having Medical Students Make Stuff. *J Med Humanit*. **2016**; 37. <https://doi.org/10.1007/s10912-016-9397-1>
10. Burgess A, Mellis C. Engaging Medical Students in the Basic Science Years with Clinical Teaching. *J Med Educ Curric Dev*. **2015**; 2. <https://doi.org/10.4137/jmeacd.s18921>
11. Hew KF, Lo CK. Flipped classroom improves student learning in health professions education: A meta-analysis. *BMC Med Educ*. **2018**; 18. <https://doi.org/10.1186/s12909-018-1144-z>
12. Julian K, Appelle N, O'Sullivan P, Morrison EH, Wamsley M. The impact of an objective structured teaching evaluation on faculty teaching skills. *Teach Learn Med*. **2012**; 24: 3–7. <https://doi.org/10.1080/10401334.2012.641476>
13. Huamán-Tapia E, Almanza-Cabe RB, Sairitupa-Sanchez LZ, et al. Critical Thinking, Generalized Anxiety in Satisfaction with Studies: The Mediating Role of Academic Self-Efficacy in Medical Students. *Behav Sci*. **2023**; 13. <https://doi.org/10.3390/bs13080665>
14. Ho YR, Chen BY, Li CM. Thinking more wisely: using the Socratic method to develop critical thinking skills amongst healthcare students. *BMC Med Educ*. **2023**; 23. <https://doi.org/10.1186/s12909-023-04134-2>



