

Cultural adaptation and validation of a scale to evaluate quality indicators in medical education: The Internal Coherence Scale

Adaptación cultural y validación de una escala para evaluar indicadores de calidad en educación médica: La Escala de Coherencia Interna

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Abstract: Background: Although information on student performance is available, data on organizational practices and processes that educational leaders can establish to encourage improvement in their schools is more limited. This study presents the process of cultural adaptation and validation of a scale with these purposes: the Internal Coherence Scale (ECI), for its application in the Spanish context of Medical Education. Methods: The cultural adaptation included: direct translations and back-translations, arriving at a pre-final questionnaire that underwent a Pre-test. Validation included an analysis of agreement (inter-observer reliability). 17 professors of different subjects from a Faculty of Medicine participated. Results: The obtained questionnaire kept the original 58 items distributed in 11 factors. It was considered to nominate as "Factor" a section with a single question (factor 8). After the pre-test, 7 additional modifications were made to the questions and a glossary of terms was offered. In the concordance analysis, in only 8 questions (15.3% of the total) the responses of the respondents were different from one assessment to another. Factor 10 ("Team Processes") had the most significantly different questions (3). Conclusions: The new version obtained from the ECI is adapted for use in the field of Spanish medical education, presenting very good concordance rates.

Keywords: questionnaire; internal consistency; cultural adaptation; validity and reliability; medical education; leadership practices; organizational conditions

Resumen: Antecedentes: Aunque se dispone de información sobre el desempeño de los estudiantes, los datos sobre prácticas y procesos organizacionales que los líderes educativos pueden establecer para fomentar la mejora en sus centros son más limitados. Este estudio presenta el proceso de adaptación cultural y validación de una escala con estos propósitos: la Escala de Coherencia Interna (ECI), para su aplicación en el contexto español de la Educación Médica. Métodos: La adaptación cultural incluyó: traducciones directas y retro-traducciones, llegando a

un cuestionario pre-final que se sometió a una Prueba Pre-test. La validación incluyó un análisis de la concordancia (fiabilidad inter-observador). Participaron 17 profesores de distintas asignaturas de una Facultad de Medicina. Resultados: El cuestionario obtenido mantuvo los 58 items originales distribuidos en 11 factores. Se consideró nominar como "Factor" un apartado con una sola pregunta (factor 8). Tras el pre-test se realizaron 7 modificaciones adicionales en las preguntas y se ofreció un glosario de términos. En el análisis de concordancia, en solo 8 preguntas (15,3% del total) las respuestas de los encuestados fueron diferentes de una valoración a otra. El factor 10 ("Procesos de Equipo") fue el que tuvo más preguntas significativamente diferentes (3). Conclusiones: La nueva versión obtenida del ECI está adaptada para su uso en el ámbito de la educación médica española, presentando muy buenos índices de concordancia.

Keywords: cuestionario; coherencia interna; adaptación cultural; validez y fiabilidad; educación médica; prácticas de liderazgo; condiciones organizativas

1. Introduction

Medical education has an important challenge in the application of educational strategies aimed at health services and professionals with teaching responsibilities to achieve effective educational interventions, mainly in the application of teaching, evaluation, and research methodologies, but also in the organization of effective educational structures. and in promoting adequate professional development to obtain skills in medical education (1). While, in the field of educational methodologies, the BEME (best evidence medical education) approach has contributed enormously to defining and systematizing effective educational interventions, research on organizational and leadership factors that influence teaching and learning they have hardly been developed (2). This is so mainly because in this field it is more difficult to delimit the variables that influence these results, and when they are delimited, these variables are more difficult to measure and relate to these learning results. Medical schools and their university hospitals, as educational centers, should, however, have reliable indicators that allow them to assess their capacity to engage in deliberate improvements in the practice of teaching and learning that they offer to their students and residents.

In this line, the "Conceptual Framework of Internal Coherence" developed in the United States mainly for general schools by R Elmore and M Forman, from the Harvard School of Education and the National Academy of Sciences (SERP Strategic Education Research Partnership 2003) (3-4), is a proposal that is based on evidence about the types of practices, processes and conditions that lead to increasing the quality of teaching and learning and aims to be a guide for educational leaders to develop plans for gets better. Figure 1 illustrates the causal order of this framework and the elements that influence the improvement of a School or Faculty. These, according to the available evidence, would be, above all, the leadership of those responsible, the involvement of their professors in the efforts to improve the Faculty, the structures and processes that support collaborative learning among educators and the knowledge, skills and beliefs (individual and collective efficacy beliefs) that educators bring to their work with students and colleagues (4). For this purpose, and within this framework, the "Internal Coherence" of an educational center is developed, which is defined as the ability of the School to improve its learning and teaching. What is intended with the measurement of Internal Coherence is not to prescribe the use of certain strategies or educational materials, but to contribute to building the collective capacity of teachers to reach shared teaching and learning objectives by aligning the work of all in the organization around an educational nucleus, that is, to identify the capacity of the center to get involved in deliberate improvements in practice, teaching and learning (level of internal coherence). The process of identifying the internal coherence of a Faculty is to explore its determining factors and offer information on the actions, processes and beliefs that influence educational performance and student learning, in order to design actions aimed at improving it. To this end, an Internal Coherence Evaluation Protocol is developed that aims to be a "clinical" tool (named by its authors to

highlight its evidence-based approach, in the purest medical tradition) usable to support professionals in their educational work. Its analysis would offer solid evidence on the process of improvement in education offered by an institution or school and should be considered as one more source together with others that evaluate the quality of teaching (curriculum evaluations, student evaluations, improvement plans, analysis of the student work,...). For this purpose, the Internal Coherence Scale (ECI) (5) has been proposed as the main tool.

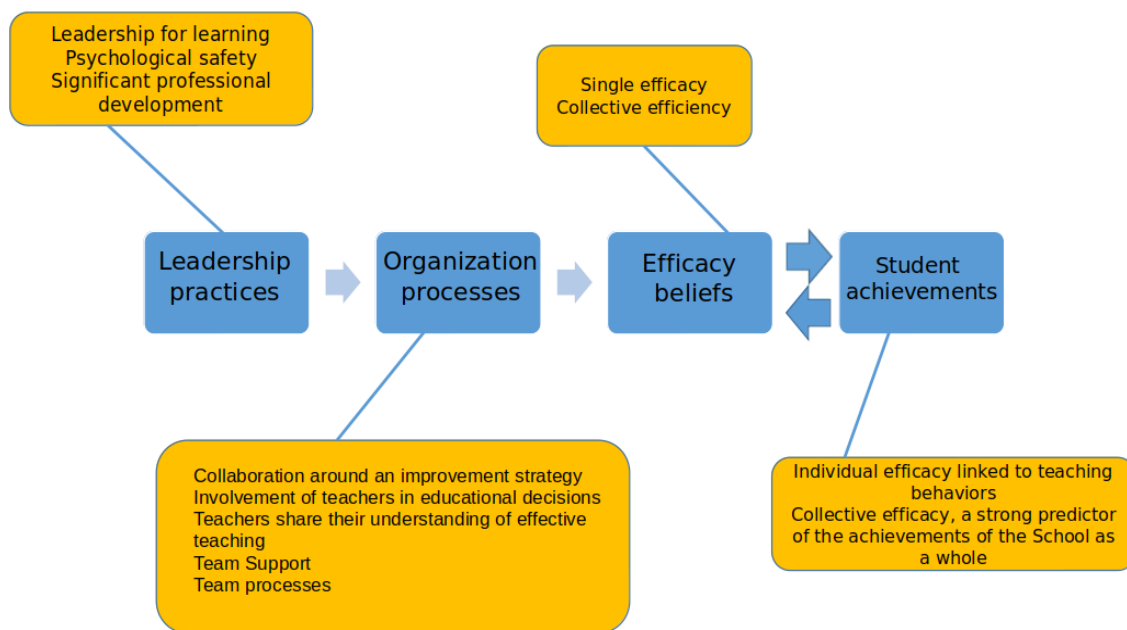


Figure 1. Conceptual framework of the Internal Coherence Model.

In Spain, although there are proposals for the evaluation of the quality of educational centers, these are generally based on a high number of indicators with disparate evidence for the assessment of the role of each one of them in the learning results and, on the other hand, In part, these have been applied mainly in the field of basic or secondary education, so in general they require a profound adaptation for use in the field of higher education in medicine (6). Likewise, there are also quality evaluation systems for medical schools (7,8), but, generally, these are also made up of a very large number of indicators, most of them also do not have sufficient evidence on their relationship with results. of significant learning, and they are usually focused on the accreditation of schools, which makes them scarcely manageable as references to monitor the evolution in organizational aspects and leadership of a teaching team. It is for all this that a specific tool, of the characteristics of the ECI can represent an agile and valid method for the established purposes. Thus, the objective of this study has been to carry out the process of cultural adaptation and validation of the ECI for its application in our linguistic and cultural context and in the field of Medical Education.

2. Methods

A cultural adaptation and validation process was carried out that included a first phase of concordance analysis (inter-observer reliability). Preliminarily, Richard Elmore was contacted and permission was obtained to proceed with the study. In a second stage, the project was presented to leaders and professors of the Faculty. The original ECI is made up of 10 Factors (each factor includes items with the same underlying idea) and a total of 58 items, with a response graded from 0 (strongly agree) to 6 (strongly disagree).

2.1. Translation and cultural adaptation

The objective of this stage was to take into account the idiomatic turns, the cultural context, and the differences in the perception of the concepts, as well as the validation in the target language (Spanish), to evaluate the degree of preservation of the psychometric properties. We started from the original version of the ECI trying to maintain its structure. The objective was to ensure that the resulting instrument maintained semantic, idiomatic, conceptual and experiential equivalence with the original questionnaire (9-10). There is consensus in the literature on how to address this first stage (9-11), so we follow the following sequence of five steps: Direct translation: two independent bilingual translators, one of them knowing the objectives, performed a conceptual translation of the instrument, offering a translation more adjusted to the language of colloquial use, detecting the difficulties of understanding and translation derived from the use of technical or unusual words. The result was compiled in two reports that were compared, discrepancies being discussed among the translators until consensus was reached. Reverse translation (back translation): the summary version was back translated into English by the two translators, blind to the original version of the questionnaire. The translators highlighted the difficult wordings and uncertainties encountered during the translation process, determining possible important semantic or conceptual differences between the original questionnaire and the synthesis version. Consolidation by the committee of experts: made up of a methodologist, a statistician, a linguist, a health professional, an educator, in addition to the translators, who with the direct translations (step 1), the synthesis version (step 2) and the back-translations (step 3) resulted in a single consolidated pre-final questionnaire adapted to Spanish. Finally, to evaluate the quality of the translation, the cultural adaptation and the feasibility of the questionnaire and aspects such as completion time, etc., a Pre-test was carried out. 17 professors from different subjects of the Faculty of Medicine participated in this. For this, they were provided with a model questionnaire in which indications about the objectives were included and after each factor or domain, blank spaces in which they were asked to make any type of comment on the questions (wording, doubts, difficulty of comprehension etc.)

2.2. Validation of the ECI in Spanish

In this first stage and due to the characteristics of the ECI scale, only its reliability was addressed (11), and from this only test-retest or intra-observer reliability was evaluated. Aspects related to the validity or capacity of the questionnaire to measure the construct for which it was designed were not addressed, considering those provided by previous studies to be valid in this first stage (5). The same 17 teachers participated in the test-retest and it was carried out with an interval of two months. For agreement between the first and second tests, the Wilcoxon test was applied.

3. Results

In the process of cultural adaptation, the expert committee consolidated a pre-final version of the questionnaire that kept the original 58 items distributed in 11 factors. It was considered to nominate as "Factor" a section with a single question (factor 8). The evaluation of its quality through the pre-test test yielded a total of 52 comments on the questions and the questionnaire factors, which were grouped according to their content in the following 11 categories: difficulty in understanding the question (3), comment on the wording of the response levels (1), proposals for more appropriate terms or words (2), additional comments to illustrate an answer (10), suggestion of question breakdown (3), clarification of a term or phrase (21) (especially for the terms "professional development" and "work team", difficulty in seeing differences between questions or their applicability (2), suggestion of change in the denomination of factor (1), suggestion of modification of one question (4), suggestion of strategy to answer question in the questionnaire (1) and four suggestions about the ECI in general. These comments led to 7 additional modifications in the questions and a glossary of terms. The final version of the ECI appears in Annex 1.

The concordance analysis showed the following results: statistically significant differences were observed between the first and second surveys in the following responses to each of the Factors; Factor 1: questions 7 and 8 ($p= 0.034$ and $p= 0.020$, respectively), Factor 4: question 22 ($p= 0.026$); Factor 6: questions 31 and 32 ($p= 0.020$ and $p= 0.046$, respectively). Factor 10: questions 47, 48 and 53 ($p= 0.039$, $p= 0.032$ and $p= 0.023$, respectively). In the rest of the questions of these factors, no differences were observed ($p> 0.05$). Factors 2, 3, 5, 7, 8, 9 and 11 did not show statistically significant differences between the responses to the first and second surveys in any of the questions ($p> 0.05$). Therefore, in only 8 questions (15.3% of the total) the responses of the respondents were different from one assessment to another.

4. Discussion

This study offers a version of the ECI adapted to the Spanish language and to the medical educational cultural environment. This tool is used by those responsible for teaching at a Spanish medical school with a high degree of reliability. Stosich (5) showed that the original ECI is a valid and reliable instrument for collecting and using diagnostic data on a school's internal consistency for educational decision-making. The evidence obtained by this author involved expert review, cognitive interviews, and a principal component analysis that led to a survey focused more on issues related to educational practice and student learning, oriented more on processes, practices, and learning. Beliefs that principals can actively foster to improve the capacity of their schools that are related to teaching and learning outcomes. Finally, this ECI is an efficient measure of the constructs related to internal coherence that we have previously defined. The ECI is therefore an effective tool to provide unique information on specific practices and processes that managers can implement to improve the capacity of their centers. The Spanish adaptation that we have carried out here, and the reliability study allow us to offer it in an unprecedented way in our medical educational context with the same objectives with which it is being used in the original context, since initially it is understandable for new users and with a battery of highly reliable questions (only eight questions, of which three were from Factor 10 (team processes) presented a lower test-retest concordance). It is evident, however, that as this scale is used in this new cultural context and purpose (medical education) it should be subject to new validation studies since "validity is an evolving property and validation is a continuous process" (12).

While substantial data is available on student achievement, more limited data is available on research-based practices and organizational processes that educational leaders can establish to encourage improvement across schools (13,14). On the other hand, given the ever-increasing challenge of being accountable, meeting professional standards and leading for continuous improvement, concrete tools are needed to help teachers apply research to the challenges of improving education. teaching their students in a valid and reliable way. Although the use of ECI, until now, is very limited in areas such as higher education and specifically in medical education (in our context, and as far as we know, it has been applied in the School of Medicine of the University of Minho : Manuel Joao Costa, personal communication to the first author), this study, by making the ECI available to the Spanish-speaking medical educational community, represents the first step to continue its validation and its application and research in this educational context, which It will allow us to advance in the understanding of how this information is applied in this new field and in its evaluation as a valid and reliable tool to collect and use information on practices, processes and beliefs related to the improvement capacity of a medical school.

5. Conclusions

- The Spanish version of the Internal Coherence Scale (ECI) is offered to collect and assess information on processes and beliefs related to the capacity for improvement of a center for medical education.
- This version of the ECI is culturally adapted for its application in the higher educational context and in the field of medical education in Spanish.

- This version of the ECI presents very high levels of intra-observer reliability.

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Appendix 1.

Internal Coherence Scale

Preliminary information

You are then asked to fill out this survey.

1. *Its objective is to explore your vision in relation to educational practices, application conditions, particular beliefs about aspects that are important in medical education and that in your opinion take place in your school, in order to find areas for improvement and intervene. . This objective is achieved if you honestly answer the questions on this scale*
2. *It is estimated that all this will take about 30 minutes.*
3. *We want to insist on the need to fill in the ECI honestly, your answers will be treated in an absolutely confidential manner. Your survey will be completely anonymous.*
4. *When you finish this task, please return your questionnaire to (Medicine; office XX)*

Clarifications:

The questions in general ask for the respondent's vision based on their experience on different generic aspects referring to the set of elements of the school and, unless specified, not to specific subgroups (person of the respondent, basic teachers, associates, full-time, ...)

This questionnaire DOES NOT CONSIDER open answers on the aspects of the content asked

"Professional development": any training activity carried out by a teacher in relation to their training (training courses/seminars, attendance at conferences,...). This term always refers to teachers and never to students.

"Teamwork": It is work between several teachers (at least two) with a common goal regardless of the subject matter.

The "school director" : is the person(s) that the respondent considers

"Personalized teaching": or individualized, to one/several students with particular characteristics

Thank you very much in advance for your valuable collaboration!!

Chosen identification code:

(last 4 digits of the DNI)

Other:

Please indicate the number of subject(s) you teach in the Medicine Degree

- One
- Two

More than two

Are you the teacher responsible for the subject or matter?

Yes

No

Do you work full time at the School of Medicine of the?

Yes

No

Leadership for learning

Please, based on your experience this year, indicate to what extent each of the following questions best describes the director of your school or faculty

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree

agree strongly agree

1. The principal of this school encourages teachers to participate in discussions about teaching and learning.
2. The principal of this school asks key questions to explore teaching and learning.
3. The principal of this school listens carefully.
4. The principal of this school promotes multiple points of view.
5. The principal of this school recognizes his own limitations with respect to his knowledge or expertise.
6. The director of this school knows effective educational methodologies.
7. The principal conveys a clear vision for teaching and learning in our school.
8. The director of this school is directly involved in helping teachers deal with educational issues in their classrooms.

Psychological well-being

Please, based on your experience this year, indicate to what extent each of the following questions best describes this experience at your school or college

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree

agree strongly agree

9. People in this school are eager to exchange information about what works and what doesn't.
10. At our school making mistakes is considered part of the learning process.
11. If I mess up at this school, it won't be held against me.
12. In this school, teachers feel comfortable using unproven teaching approaches even though they may not work.
13. In this school, you can easily expose what you think.
14. People in this school often feel comfortable dealing with problems and disagreements about teaching and learning.

Professional development

Please, based on your experience this year, indicate to what extent each of the following questions best describes the professional development experiences at your school or college

For the following questions, select one of the following:

- strongly disagree disagree somewhat disagree somewhat agree
 agree strongly agree

15. My professional development experiences this year have been closely tied to my school improvement plan.
16. My professional development this year has included ample time to think through, test, and evaluate new ideas.
17. My professional development experiences this year have been valuable to my work as a teacher.
18. My professional development experiences this year have been designed in response to the learning needs of faculty as they have arisen.
19. My professional development experiences this year have been followed up and supported in applying what I have learned.

Collaboration around an improvement strategy

Please, based on your experience this year, indicate to what extent each of the following questions best describes this experience at your school or college

For the following questions, select one of the following:

- strongly disagree disagree somewhat disagree somewhat agree
 agree strongly agree

20. Our school has an improvement plan that we all know
21. Our efforts are focused on improving the whole school through clear and concrete steps.
22. We coordinate academic content, teaching methods and learning materials with our school improvement plan.
23. The programs or initiatives we implement are clearly related to our school improvement plan.

Teacher participation in teaching decisions

Please, based on your experience this year, indicate to what extent each of the following questions best describes the work of a teacher in your school or college

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree

agree strongly agree

24. The teachers of this school work together to plan its improvement.
25. The teachers of this school work together to select the teaching methods and activities
26. Teachers at this school work together to evaluate the curriculum and teaching programs.
27. Teachers at this school work collaboratively to determine professional development needs and goals.
28. Teachers at this school work collaboratively to plan professional development activities.
29. As a faculty, we work to develop a shared vision of what is effective in education.
30. As a faculty, we regularly review and revise our ideas about the most effective teaching methods to use with our students.

Collective efficiency

Please, based on your experience this year, indicate to what extent each of the following questions best describes the teachers in your school or faculty

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree

agree strongly agree

31. Teachers at this school are confident in their ability to motivate their students.
 32. The teachers at this school have the necessary skills to ensure that student learning is meaningful.
 33. If a student doesn't learn something the first time, teachers will try another way.
- strongly disagree
34. The teachers at this school believe that every student can learn.
 35. The teachers of this school handle different teaching methods.
 36. Teachers at this school are equipped to explore new teaching approaches to help low-achieving students achieve.

Do you participate in a Work Team well in relation to subject matters/s or with cross-cutting issues of the school?

37. Select as appropriate

Yes on a team related to cross-grade issues

Yes in a team related to subject content/s

Others

I do not participate in a team of teachers (Skip to question 54 in the "Individual Efficacy" section)

If you participate in more than one team, please choose one on which to base your answers to the following questions.

Shared team understanding of effective practices

Please indicate how often you have worked with your team members to do each of the following tasks this year

For the following questions, select one of the following:

never almost never (once a year or every two years) two or three times a year almost once a month (except during vacation periods) two or three times a month weekly

38. How often have you worked with members of your team to discuss teaching decisions based on student assignments?

39. How often have you worked with members of your team to discuss teaching decisions about student academic outcomes?

40. How often have you worked with members of your team to evaluate teaching or assessment materials?

41. How often have you worked with members of your team to discuss specific class content or teaching methods?

Team Support

Please, based on your experience this year, indicate to what extent each of the following questions best describes the academic direction of the school or faculty

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree
 agree strongly agree

42. The principal of this school offers the teaching teams an appropriate balance between direction and independence.

43. The principal of this school offers a clear and relevant purpose for teachers to work together.

44. The director of this school facilitates the necessary time for the teams of teachers to meet.

45. The director of this school makes sure that the meeting time a teacher has is guaranteed and regular throughout the year.

46. The director of this school supports the teams of teachers to carry out the educational decisions made by the group.

Team processes

Please, based on your experience this year, indicate to what extent each of the following questions best describes your experience with your team.

For the following questions, select one of the following:

strongly disagree disagree somewhat disagree somewhat agree
 agree strongly agree

47. Our team meetings have an agenda that we do our best to follow.

48. There is always someone responsible for guiding or facilitating our team discussions.

49. When our team makes a decision, all teachers on the team take responsibility for carrying it out.

50. Our team meetings include productive discussions.

51. All team members actively participate in our collective learning.
52. Team meetings are related to each other and to the overall goal of the team.
53. There is a clear connection between the work of our team and the improvement plan of our center.

Single efficacy

Please, based on your experience this year, indicate to what extent each of the following questions best describes this experience at your school or college

For the following questions, select one of the following:

- very unsafe unsafe rather unsafe rather safe safe
 very safe

54. How confident are you that you can ask your students good questions?
55. How confident are you that you can use various evaluative strategies?
56. How confident are you that you can provide alternative explanations or examples when students are confused?
57. How confident are you that you can provide appropriate challenges to gifted students?
58. How sure are you of being able to give personalized teaching?

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