Validation of the questionnaire of perception of the importance, usefulness and structure of the syllabus in microcurricular planning

Validación del cuestionario de percepción de la importancia, utilidad y estructura del programa de estudios en la planificación microcurricular

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Abstract

Objective: to construct and validate the questionnaire of perception of the importance, usefulness and structure of the syllabus in micro-curricular planning. **Methodology**: instrumental, prospective, quantitative approach. Participants: The Delphi method was used, with the judgment of 6 experts. For the validation of the construct, 91 people participated, including teachers and students of the Catholic University of Cuenca. **Instrument**: Two instruments were designed for teachers and students, EVSIUC-2021; with two sections: identification data, and evaluation of the syllabus elaborated under two dimensions: 1) Structure and 2) Usefulness/Importance, with a Likert-type scale**. Statistical analysis**: Shapiro Wilk normality test; the omega coefficient described by McDonald, confirmatory factor analysis (CFA) to validate the construct and the R program. **Results**: teachers' questionnaire; experts demonstrated content validity higher than 0.58, 4 items were eliminated and a global validity of 0.79 was obtained. Student questionnaire had a validity ratio of 0.58, 1 item was eliminated and an overall validity of 0.81 was obtained. Pilot test did not adjust to parametric criteria p=.000. McDonald test yielded 0.815 in the teachers' survey and 0.981 in the students' questionnaire. Overall satisfaction: teachers 88%, students 80%; usefulness, importance, structure: teachers 45.5%, students 80%.

Keywords: psychometrics, Validation of instruments, Silabo, competencies.

Resumen

Objetivo: construir y validar el cuestionario de percepción de la importancia, utilidad y estructura del sílabo en la planificación microcurricular. **Metodología:** estudio instrumental, prospectivo, enfoque cuantitativo. **Participantes:** se empleó el método Delphi juicio de 6 expertos. Para validación del constructo participaron 91 personas entre docentes y estudiantes de la Universidad Católica de Cuenca. **Instrumento:** Se diseñaron dos instrumentos, para docentes y estudiantes, EVSIUC-2021; con 2 secciones: datos de identificación, y la evaluación del sílabo elaborado bajo dos dimensiones: 1) Estructura y 2) Utilidad/Importancia., con escala tipo Likert. **Análisis estadístico:** prueba de normalidad de Shapiro Wilk; el coeficiente omega descrito por McDonald, el análisis factorial confirmatorio (AFC) para validar el constructo y el programa R. **Resultados:** el cuestionario docentes; expertos demostraron validez de contenido superior a 0,58, se eliminaron 4 ítems y se obtuvo una validez global de 0,79. el Cuestionario estudiantes tuvo una razón de validez de 0,58, se eliminó 1 ítem y se obtuvo una validez global de 0,81. Prueba piloto no se ajustaron a criterios paramétricos p=,000. Prueba de McDonald arrojó 0,815 en la encuesta a docentes y 0,981 en el cuestionario de estudiantes. Satisfacción global: docentes 88%, estudiantes 80%; utilidad, importancia, estructura: docentes 45,5%, estudiantes 80%.

Palabras clave: psicometría, validación de instrumentos, Silabo, competencias.

Introduction

The syllabus is the micro-curricular planning instrument that synthesizes fundamental aspects to be reviewed during an academic course; the subject matter, methodology, learning activities and forms of evaluation. This micro-curricular tool constitutes an agreement or commitment between the teacher and the student in which each one commits himself and fulfills his role within the educational process. It serves as a guide for both teachers and students, and improves the quality of education[1].

For Jerez, Hasbún and Rittershussen 2015[2], the syllabus must respond to the graduate profile. The educational model, a fundamental aspect, mentions that all teaching and learning activities are designed by the teacher; it encompasses the main elements of the educational process, i.e., it defines the responsibilities, achievements and goals of the students. At the National University of Piura, the syllabus is evaluated by competencies, a qualitative research that begins with the training of teachers in the construction of syllabi to evaluate the quality of the micro-curriculum. A checklist was used to verify whether the syllabus contained the proposed structural elements, and it was concluded that the syllabus did not contain the elements[3].

Improving the educational process implies innovation in the classroom, which has undoubtedly renewed the teaching and learning process; likewise, the great advances in information and communication technology have been the basis for the implementation of more creative educational environments, allowing the implementation of new methodologies and teaching and learning strategies[4].

In Europe and Asia, several countries have been and are referents in the implementation of successful and innovative educational models, and the use of technology has been fundamental in the teaching and learning process planned in the micro-curriculum[4].

A syllabus by competencies is a practice that improves teaching and learning, it establishes profound changes at all educational levels; Antesana 2015[5], mentions that there are two groups of competencies; the first group focused on the subject (basic, professional and personal competencies), these competencies are basic for the performance of the student during his life, they are skills and knowledge related to the discipline. The generic competencies are concrete abilities that are independent of the learning environment.

In Ecuador, the pedagogical improvement program of the Ministry of Education is aimed at proposing policies and strategies to improve the quality of education through the innovation of teaching and learning processes. The structural changes implemented by the Pedagogical Improvement Program include the design of pedagogical proposals, institutional educational project for harmonious coexistence, school projects, reading promotion programs and school libraries; they are paths that guide and improve teaching and learning through the use of innovative strategies[6].

According to UNESCO, competencies play a fundamental role in the curriculum. A competency-based curriculum allows students to be critical and to act in different areas; knowledge is acquired by doing, by experimenting, and, in the end, evaluation is based on what students are capable of doing or solving. In addition, the competencies obey four essential lines: learning to be, learning to know, learning to do and learning to live[7].

It is important to implement active methodologies in the classroom; that is, those methods, techniques and strategies that can be used by the teacher to turn teaching and learning into a dynamic process that encourages student participation. Consequently, teaching in higher education requires substantial changes that are able to respond to the needs and demands of today's society[8].

Higher education in Ecuador.

Since 2007, the educational system in Ecuador has undergone transformations aimed at continuous quality improvement. These changes have been implemented under the supervision of state entities created to regulate teaching, accreditation and evaluation, with strictly enforced standards and procedures. These institutions are: National Secretariat of Science and Technology (SENESCYT), Council of Higher Education (CES) and Council of Evaluation, Accreditation and Quality Assurance (CEAACES), same that have been in charge of monitoring compliance with the regulations[9].

In this framework, quality refers not only to goods but also to services; according to the International Organization for Standardization (ISO), quality is the degree to which a set of inherent characteristics meets requirements, and can be applicable to both products and services. In this case, education is a service that Higher Education Institutions (HEI) provide to the community. In this context, with respect to quality, the Organic Law of Higher Education (LOES) in Ecuador, Art. 95 states that: "Quality is a principle that consists of the constant and systematic search for excellence, relevance, optimal production, transmission of knowledge and development of thought through self- criticism, external criticism and permanent improvement"[10].

In Ecuador, several strategies have been taken to improve the quality of higher education; in this sense, Zamora et al. conducted an analysis of existing information in the files of the state regulatory bodies in terms of higher education, i.e. the Ecuadorian Institute of Statistics and Census (INEC), SENESCYT and CEAACES: the Ecuadorian Institute of Statistics and Census (INEC) SENESCYT and CEAACES, it was found that one of the strategies to improve the quality of higher education were: increasing the budget for universities, the categorization of universities, the regularization of the salaries of university professors, encouraging the training of teachers at the fourth level and doctorates. The scientific production of university teachers between 2014-2015 was low and was expected to improve with the academic training of teachers[9].

The structure of the micro-curriculum.
The elaboration of the syllabus and lesson plan is a real challenge for the teacher, strategies that are built based on the student's reality. It must contain elements such as: objectives, activities, methodological strategies, resources, evaluation and program contents. In this sense, Ecuador conducted a qualitative study in a group of teachers to determine how teachers carry out their micro-curricular planning. They conclude that the lesson plans dynamizes the educational structure, the teacher must have mastery of the subject and must carry out his or her micro-curricular planning using current technological resources[11].

The accreditation of HEIs ensures quality in higher education. The continuous improvement of quality depends on factors such as the redesign of subject programs where the graduate profile, learning outcomes and the Educational Model of the HEI play an important role. Teachers must change paradigms, from their old role of transmitter of knowledge to facilitator in the construction of knowledge[12].

In this same field, for Ramírez et al. in 2014[13], the syllabus has six stages of elaboration and nine elements. For the authors, the stages of elaboration of the syllabus are the following: Diagnosis, competencies, contents, teaching-learning strategies, didactic resources and evaluation. Its elements are: general data, description of the subject, competencies of the curricular experience, conceptual, procedural and attitudinal contents, methodological strategies, educational means and materials, evaluation criteria, counseling by teachers, and basic and specialized bibliography.

Micro-curriculum by Competencies.
A competency is the ability to face and solve new tasks; in the case of students, it is measured as their ability to solve tasks different from the usual ones inside or outside the classroom.

Competencies are important in higher education for several reasons, among them: increased relevance in educational programs, quality management, international educational policy, and mobility[12].

In Chile, a qualitative study was conducted on micro-curricular design strategies by learning outcomes at Sek University. The objective was to design a micro-curricular planning strategy considering the relationship between the objective and the learning outcomes as a contribution to the didactic components and the graduate profile. Working in teams allowed professors to recognize that teaching planning is a basic element in the teaching-learning process[14].

The comparative study carried out by Merchán et al. on the curricular elements of the syllabus in universities in Spain, Portugal and Ecuador, to determine the structure of the syllabus, its semantic relationships and the sequencing of the elements. The study concludes that the 14 syllabi studied had 16 common components, but new elements were also found, the sequence of the components is different in each of the syllabi, some universities consider this instrument only for recording information, in most there is no evidence of evaluation policies, attendance, homework. Few universities consider the syllabus as a learning tool. Only a few syllabi show the planning of syllabi, competencies, chronogram and innovative experiences. It is important to point out that only the University of Valencia complies with all the parameters that correspond to its function as a learning tool[1].

The micro-curriculum defines the teaching and learning strategies that the teacher implements in the classroom. In this sense, at the University of Guayaquil, Ecuador, a mixed qualitative study was conducted to learn about the structure and usefulness of the syllabus, a questionnaire was applied to teachers to learn about their perspective on the structure, usefulness and importance of the syllabus: 72% of teachers consider the syllabus to be a detailed program, 38% would change the format of the syllabus, 94% say the syllabus is useful for the student, 55% say they are useful for classes, 80% of teachers cover all the contents stated in the syllabus, of the syllabus components 60% refer to the objectives as being more important, 77% say the syllabus is a contract between teacher and student[15].

The curriculum of a career must be designed in consensus with all educational actors. However, the construction of the micro-curriculum is the exclusive responsibility of the teacher, considering the needs of the students. For the authors Barrazueta, Bravo and Trelles, the essential elements to elaborate the didactic microcurricular planning are the following: informative data, planning, curricular adaptations, skills and abilities[16].

Competencies are dynamic performance processes that encompass knowledge, skills and values that an individual develops throughout his or her life and that will influence personal and professional performance. A study was conducted in Peru to determine the application of a competency-based syllabus; with quantitative and qualitative methodology and action research. Non-probabilistic sample, 7 managers, 20 teachers and 380 students. It was found that 80% of the teachers stated that they had obtained good results with the students and 93% confirmed the development of competencies. Ninety- three percent of the students mentioned that research-based learning is important, confirming that the learning received under this modality will be very useful for their professional life[17].

To ensure the quality of the research instrument, its scope and scientific rigor, it is necessary to validate it, validation of instruments is a complex process and is considered as an intervention study. Questionnaires are data collection instruments that allow quantification, therefore, they can be validated in order to universalize them[18].

With the aforementioned background, and considering the importance of validating research instruments that achieve scientific rigor, the study was conducted with the objective of developing and validating a research instrument to measure the perception of teachers and students on the importance, usefulness and structure of the syllabus in the Nursing program at the Catholic University of Cuenca.

Methodology

Design

Instrumental and prospective study with a quantitative approach, its objective was to construct and validate a scale to evaluate the structural characteristics, importance and usefulness of the syllabus perceived by teachers and students of the Catholic University of Cuenca. Some authors [19,20] define instrumental studies as those works oriented to the creation or adaptation of procedures, instruments, devices or tests, as well as to the analysis of their psychometric properties.

Participants

For the validation of the content[21,22] the Delphi method of expert judgment was used, 6 experts were invited, who were selected according to the fulfillment of at least 3 of the following inclusion criteria: 1) Teaching experience of at least 3 years at the Catholic University of Cuenca, 2) Having regional or scientific publications, 3) Being specialists in Education Sciences, Pedagogy or University Teaching, Magister or PhD, 4) Teaching or having taught subjects related to research methodology.

Table 1. Fulfillment of selection criteria judges/experts

		Teaching experience	Publications	Eng/ Mgs / PhD	Subject Research
	1	✓	✓	✓	✓
	2	✓	✓	✓	✓
Judges/ Experts	3	✓	✓	✓	✓
	4	✓	✓	✓	✓
	5	✓	✓	-	✓
	6	✓	✓	-	✓

With regard to the validation of the construct, 91 people were invited, including teachers and students from the Catholic University of Cuenca, Azogues, to whom a pilot test was applied, which allowed the respective statistical analysis to validate the construct.

Instrument

Two instruments were designed according to criteria and dimensions found in the literature and available scientific evidence[23,29], one for teachers and the other for students, naming them EVSIUC-2021. Both scales are made up of two sections, the first or section A, which contains identification data such as sex, age, cycle, career, campus and modality of studies to which it belongs; the second section (B) corresponds to the evaluation of the syllabus itself, which was constructed under two dimensions to be evaluated: 1) Structure and 2) Usefulness/Importance. Initially, the instrument for teachers had 22 affirmative questions, while for students there were 16 initial items, both on a Likert-type scale from 1 to 5 (1 strongly disagree and 5 strongly agree).

After the different validation phases proposed in the literature[23,26,27,29,31], the EVSIUC- 2021 instrument for teachers consisted of 18 questions to which an external item or indicator was added to collect the teachers' suggestions regarding possible changes in the syllabus. This last item is not considered for the total score of the scale, since it is an open-ended question (What changes would you make to the syllabus?). The questions included in the instrument make it possible to evaluate the structural characteristics, importance and usefulness of the syllabus as perceived by the teachers. The items established in the "Usefulness/Importance" dimension are those coded from 201 to 211, while in the "Structure" dimension the items coded 212 to 218 are located. For the EVSIUC-2021-Teachers scale, a score ranging from 0 to 54 total or direct points is considered, for which the following steps must be followed:

1. Add items coded 201 through 212 and record as SUBTOTAL 1.
2. Add items 213 through 218 and record as SUBTOTAL 2.
3. Subtract subtotal 1- subtotal 2 to find the final direct (total) score.

A total score equal to or greater than 30 constitutes a satisfactory level of perception of the syllabus among the teaching staff; scores below 30 indicate that the perception is not satisfactory and the syllabus can be improved. the total time for answering the questions in the instrument is 8 to 15 minutes and can be appliedindividually or in groups.

EVSIUC-2021-STUDENTS, like its counterpart for teachers, was structured in 2 sections: A. Identification data and B. Evaluation of the syllabus, which in the end was left with 15 questions of the 16 initially proposed, which were written in affirmative action to be answered on a Likert-type scale from 1 to 5, which leads us to evaluate the structural characteristics, importance and usefulness of the syllabus perceived by students, in the same dimensions as for teachers. The items established in the "Usefulness/Importance" dimension are those coded from 201 to 2010, while in the "Structure" dimension the items coded 211 to 215 are located. The score ranges from 0 to 57 and to achieve it, the following must be done:

1. Add items 201 through 212 and record as SUBTOTAL 1
2. Add items 213 to 215 and record it as SUBTOTAL 2.
3. Subtract subtotal 1- subtotal 2 to find the final direct (total) score.

A total score equal to or greater than 30 constitutes a SATISFACTORY level of perception of the syllabus among students, scores below 30 are indicative that the level of perception is not satisfactory and the syllabus can be improved.

Procedure

The instrument to evaluate the perception of the structure and usefulness of the syllabus as a micro curricular planning tool in teachers and students of the Catholic University of Cuenca arises in the framework of the "Strengthening Plan" for the accreditation of the Nursing career, Azogues headquarters, In response to this need, a research protocol was presented to the Career Direction requesting the respective authorization to carry out the project, then we proceeded to the development of the construct by reviewing the existing literature collecting the contributions of several authors[24,26,28,30,32] to iden-

tify and establish the dimensions to be evaluated. With this information and through the "brainstorming" method, the researchers designed a first version of the EVSIUC-2021 scale for teachers (22 questions) and students (16 questions) with 2 dimensions: "Structure" and "Usefulness/Importance".

After the construction of the instrument, the process of testing its validity and reliability began[33]. The judges selected for content validity based on compliance with the established criteria (see Table 1), received the questionnaires via e-mail along with a letter of invitation, explaining the research objectives and asking them to individually evaluate the questions according to the importance or relevance of the item to measure the perception of the structure, importance and usefulness of the syllabus as a micro- curricular planning instrument, based on the following scale: 1) Not important, 2) Useful but not essential, and 3) Essential. In addition, the judges or expert evaluators could put their comments or suggestions in the format designed for content validation. The experts' responses were received within 20 days, after which the information was processed and the suggested modifications were made.

To validate the construct, a pilot test was conducted with 41 teachers and 50 students in order to determine the comprehension, acceptability and application time of the instrument[26]. In this phase, according to Hernández Sampieri[23], the instrument was administered to a small sample to test its relevance and effectiveness, that is, from the pilot test the reliability[33] and validity of the instrument were calculated by means of statistical tests[34], thus defining the final version of the instrument.

Statistical Analysis

Prior to the application of the statistical analysis, the database contained in the spreadsheet of the LibreOffice package was verified in order to detect incomplete data; in addition, the spreadsheet with the data provided by the judges or experts was validated by means of the content validity index (CVI) proposed by Lawshe in 1975 and modified by Tristán in 2008[22]. Similarly, with the pilot information, the Shapiro Wilk normality test was performed to analyze the distribution of the data, descriptive statistics were also obtained and to evaluate the reliability of the instruments, the omega coefficient, described by McDonald in 1999[33], was used to evaluate the reliability of the instruments. Finally, confirmatory factor analysis (CFA) was performed to validate the construct[27,28,30,35–37]. Statistical analyses were performed using the R program.

Results

The results of the research are presented in two sections: 1) Psychometric properties of the instruments and 2) Results of the pilot test.

Psychometric properties EVSIUC-2021

The results of the validation by experts on the instrument for teachers, applying the Lawshe-Tristan method[22], showed that the value of the content validity ratio (CVR') of each item was higher than 0.58, considered acceptable according to Tristan[22], except for items 2, 3, 4 and 6 which were eliminated; without these items the overall content validity (CVI) of the instrument was 0.79, higher than 0.58 (Table 4).

For its part, the validation of the instrument to be applied to students obtained a CVR' value greater than 0.58 in most of the items, item 4 being the only one that did not meet this characteristic. Consequently, the question was eliminated and the CVI was set at 0.81.

Table 2. Content Validity Ratio VSIUC-2021 (Lawshe-Tristan Method)

Dimensions	# Item Teachers	CVR' Teachers	Item Students	CVR' Students
Utility / Importance	1	.67	1	.67
	2	.50*	2	.83
	3	.33*	3	.83
	4	.17*	4	.50*
	5	.83	5	.83
	6	.50*	6	1.0
	7	.83	7	.83
	8	1.0	8	.83
	9	.67	9	.83
	10	.67	10	.67
Evaluation of the syllabus	11	.83	11	.83
	12	.83	-	-
	13	.83	-	-
	14	.67	-	-
	15	.67	-	-
Structure	16	.83	12	.83
	17	.83	13	.67
	18	.83	14	.83
	19	.83	15	.83
	20	.83	16	.83
	21	.83	-	-
	22	.67	-	-
CVI eliminating items with a value less than 0.58*.	-	.79	.	.81

It is important to point out that there was total agreement among the judges regarding the parameters to be assessed in section "A" of the instruments (see annexes 2 and 3), which collect data on the identification of the participants. The following are some of the experts' suggestions that were incorporated into the final version of the instruments:

"In item 1 coded as 201 of the instruments for teachers and students change the term "that serves" to the term "useful".

"It is suggested that in item 4 of the instrument for teachers the term "stipulated" be replaced by "established"", assuming that it is a word of better understanding.

"In item 6 of the instrument for teachers coded as 206, it is suggested that the following statement be added: "It is essential that the syllabus be updated at the beginning of each academic year".

"In item 6 for students and 7 for teachers add to the text the word bibliography."

After establishing content validity by expert judgment and applying the pilot test, the Shapiro Wilk normality test was performed, showing that the underlying distribution doesnot fit the so-called parametric criteria (p= .000) in all the items, i.e. the data do not havea normal distribution (Table 5). The reliability of the instrument was evaluated with the information obtained in the pilot test using the McDonald omega coefficient, which is an alternative method to Cronbach's alpha and is recommended for estimating reliability when working with ordinal variables. An acceptable reliability value is considered when the omega coefficient is between 0.70 and 0.90 [33]. The EVSIUC-21 scale for teachers obtained a McDonald omega coefficient of 0.815, while for the instrument applied to students the score was 0.981, which indicates an acceptable reliability for both instruments Table 3.

Tabla 3. Normality and internal consistency test results (reliability)

Shapiro-Wilk normality test (p)	EVSIUC-2021 Teacher (McDonald's Omega)	EVSIUC-2021 Students (McDonald's Omega)
Value .000	.815	.981

Finally, to validate the construct, a confirmatory factor analysis (CFA) was performed after evaluation of the Kaiser-Meyer-Olkin (KMO) sample adequacy criterion and Bartlett's sphericity criterion (**Table 4**), where a *"p"* value greater than 0.7 is considered acceptable in the case of KMO, while for Bartlett's sphericity test a *"p"* value of less than is satisfactory to decide the application of the CFA[8,12].

Table 4. KMO Index and Bartlett's test of sphericity EVSIUC-2021

		EVSIUC Teacher	EVSIUC Student
Bartlett's test for sphericity	KMO	.797	.941
	Chi-cudrado	655.030	1061.315
	Gl	153	105
	Sig.	.000	.000

The factorial model with two principal components for the teachers' and students' instrument was carried out taking into account that the variables were *ordinal*, so the factorization of principal axes was used (method based on the weighted least squares model), which is recommended in the literature consulted[27,38]. The direct oblimin rotationcriterion was applied, since according to López and Gutiérrez[38] the best strategy is to choose an oblique rotation method (oblimin) under the assumption that in the field of health, education and other social sciences most of the variables are related to each other. Table 5 presents the factorial grouping of the items of the EVSIUC-2021 scales for teachers and students.

Thus, it can be observed that the saturation of all the items is higher than 0.40, the recommended criterion for estimating the factors to be retained[39]; therefore, 18 items were considered in the final instrument for teachers and 15 for students.

The model was validated considering measures of absolute fit, which according to MacDonald and Ho, these indicators determine how well a model fits a priori to the sample data[18,19]. The measures of fit obtained include: the Chi-square test (*X2*), which indicates a good fitof the model when it provides an insignificant result greater than 0.05; the non-centralityparameter (NCP) which is an alternative measure of Chi-square in small samples, where values less than 2 are acceptable; the root mean square error of approximation (RMSEA) which indicates an approximation of the model with reality when its values are below 0.05; and, the residual standardized root mean square residual (SRMR) which considers values less than 0.05 acceptable[18,19].

Table 6 shows the results of the fit indicators for the EVSIUC 2021 instrument applied toteachers and students. These measures indicate how well the proposed theory fits the data. Acceptable values were found in three of the four indices for the instrument for teachersand in two indicators of the instrument for students.

Table 5. Matrix of standardized factor loadings (rotated saturation) EVSIUC-2021

	EVSIUC-2021 Teachers Factor		EVSIUC-2021 Student	
	1	2	1	2
P1 (code201)	.909		.958	
P2 (code 202)	.845		.873	
P3 (code 203)	.881		.965	
P4 (code 204)	.724		.72	
P5 (code 205)	.901		.958	
P6 (code 206)	.849		.821	
P7 (code 207)	.582		.928	
P8 (code 208)	.646		.857	
P9 (code 209)	.699		.707	
P10 (code 210)	.675		.891	
P11 (code 211)	.905			.865
P12 (code 212)		.64		.676
P13 (code 213)		.655		.861
P14 (code 214)		.811		.851
P15 (code 215)		.782		.739
P16 (code 216)		.654		
P17 (code 217)		.631		
P18 (code 218)		.524		

Note: Extraction method: principal axis factorization.
Rotation method: Oblimin with Kaiser normalization. Factor 1 = Utility/importance. Factor 2= Structure. P= question

Table 6. FC: Model fit indices applied to the EVSIUC-2021 scale

	X2 (p)	NCP	RMSEA	SRMR
EVSIUC Teachers	.448*	1.490*	.017*	.2498
EVSIUC Students	.303*	6.433	.038*	.1269

Discussion

The lack of scientific rigor in many research studies is due to the lack of validation of the instruments used for data collection, especially in qualitative studies where various types of instruments are used that are not suitable for the methodology employed.

In 2019 Lopez et al, analyzed 102 doctoral theses in which the most used instrument was the survey, instruments were elaborated that in the best circumstances responded to the objectives; this motivated the authors to propose a methodology for the validation of instruments. In this sense, the authors mention important aspects such as validity and reliability. Reliability is measured through reproducibility with Pearson Spearman correlation, and reliability with Aiken's V and Dahlberg's error. Validity with measurement accuracy with the Gold Standard test and parametric and non-parametric tests. The researchers also mention that there are several

validation methods, distributed in the following phases: content validation, reliability, construct validity and factor analysis, criterion validity, explanatory phase of the research, and application through theevaluation of the explanation[40].

The authors recommend adjusting the phases according to the researcher's needs, taking into account the relevant scientific rigor[40].

The validation of the instrument to measure the perception of teachers and students on the importance, usefulness and structure of the syllabus in the micro-curricular planning, in the Nursing career, was elaborated considering several parameters that are effectively cited by López et al. Thus, to evaluate the content, the Delphi method was used, expert judgment; 91 invited people participated in the validation of the construct and a pilot testwas applied to them. With the information obtained from the pilot test, Shapiro Wilk normality tests were applied to analyze the distribution of the data, and descriptive statistics were obtained. To evaluate the reliability of the instruments, the Omega coefficient and confirmatory factor analysis were applied using the R program.

On the other hand, Pelegrin et al. in Cuba 2016[31], designed and validated an instrument to determine the educational needs of patients in relation to therapeutic adherence, which was constructed in two stages: the search for and analysis of information and the development of the reagents or questions. Content validation was carried out by consulting experts or the Delphi method; reliability was assessed through internal consistency or Cronbach's Alpha and the Kappa index. Internal consistency was assessed with the application of a pilot sample. Likewise, a very similar process was used in the nursing career for the validation of the instrument; the search and analysis of information for the construction of the instrument, the evaluation of the content with the support of expert judgment or Delphi method, to evaluate the construct a pilot test was used, in the statistical processing Shapiro Wilk normality tests were applied and descriptive statistics were obtained, and to determine the reliability of the instrument the Omega coefficient was applied.

Conclusions

During the development of this work it has been possible to consolidate several purposes,one of them was to build two instruments to evaluate the perception of teachers and students of the Catholic University of Cuenca regarding the structure, usefulness and importance of the syllabus as a micro curricular planning tool, this was done under an arduous review of the available scientific evidence. A second purpose, which became thepurpose of the study, was to validate the scale-type instruments, for which we resorted tothe judgment of experts and thus proceed with the validation of the content; however, we had to validate the construct through CFA and establish the internal consistency using McDonald's omega, in this way we obtained the total validity. Another purpose accomplished was to carry out the pilot test that helped us to have a first impression of the possible responses that could be generated in these scales, which were called EVSIUC-2021.

It is important to emphasize that the psychometric properties described for the EVSIUC 2021 scales show that the instruments developed are relatively valid and reliable to be applied in the university community, this will allow teachers and students to evaluate and forge reflections on the importance, usefulness and structure of the syllabus currently used at the Catholic University of Cuenca. In this sense, the authorities of the institution will be able to generate cycles of continuous improvement to strengthen this important tool of academic work.

The CFA validated the construct and a positive aspect to point out is that the statistical criteria were rigorously applied, however, it should be explained that the instrument for teachers presented acceptable fit indicators in three out of four indices obtained, while theinstrument for students only in two, this suggests that it should be taken into account that:although the fit indices are a useful guide, a structural model such as the CFA should alsobe examined from a theoretical point of view, hence it is under the responsibility of the researcher to apply or not the validated instruments.

The limitations that can be found in this study are mainly related to the size and type of the sample, since we worked with a small non-probabilistic sample; however, the review of the literature and the statistical tests of KMO and Bartlett's sphericity index opened the way to justify the application of the CFA under the principal axis factorization method with direct oblimin rotation.

Another limitation is that the results of the pilot test do not allow us to reach significant conclusions, although a brief description has been provided that shows satisfactory overall levels among both teachers and students regarding the importance, usefulness andstructure of the syllabus used at the Catholic University of Cuenca.

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