The teaching of the Learning to Learn competence in university degrees (Pedagogy and Social Education)

La enseñanza de la competencia Aprender a Aprender en grados universitarios (Pedagogía y Educación social)

O ensino da competência Aprender a Aprender em cursos universitários (Pedagogia e Educação Social)

在大学学位课程中教授"学会学习"能力（教育学与社会教育）

تعليم مهارة "التعلم للتعلم" في التخصصات الجامعية (علم التربية والتعليم الاجتماعي)

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Abstract

The Learning to Learn competence was proposed by the European Union (2006 and 2018) as a key competence for lifelong learning. Although it has been thought that learning to learn had to be taught in pre-university training, there are studies that confirm that university students lack an adequate management of competence. In this work, an educational intervention program was applied to teach this competence in a subject of the degrees of Pedagogy and Social Education at the University of Valencia. The objective was to increase the level of management of this competence by the students. A pretest-posttest quasi-experimental design was used with a sample of 116 subjects belonging to 3 experimental groups and qualitative data were also collected. A training program integrated into the teaching dynamics of the subject was designed and applied with five sessions of around one hour in which processes and skills integrated into the competence were worked on: cognitive, metacognitive and ethical. The QELtLCUS questionnaire and a rubric developed ad hoc were used as measurement instruments. Contrasting data pretest-posttest, significant improvements were found in the scores of the questionnaire, in cognitive, metacognitive and ethical dimensions, and of the rubric related to the contents of the program, in the three dimensions worked on. The participating students valued also positively the program. The positive results confirm the effectiveness of the program and encourage us to continue in this way, with programs integrated into the subjects and using assessment instruments that include the assessment of the use of this competence in real tasks.

Keywords: *learning to learn, competency based education, higher education, educational programmes.*

Resumen

La competencia Aprender a aprender (AaA) fue propuesta por la Unión Europea (2006 y 2018) como competencia clave para el aprendizaje a lo largo de la vida. Esta competencia se enseña en la formación preuniversitaria pero hay estudios que confirman que el alumnado universitario adolece de un adecuado dominio de ella. En este trabajo se ha aplicado un programa educativo para enseñar la competencia en una materia de los grados de Pedagogía y Educación Social de la Universidad de Valencia. El objetivo era incrementar el nivel de manejo de la competencia del alumnado. Se usó un diseño cuasiexperimental pretest-postest con una muestra de 116 sujetos pertenecientes a 3 grupos experimentales y se recogieron también datos cualitativos. Se diseñó y aplicó un programa formativo integrado en la dinámica docente de la materia con cinco sesiones de alrededor de una hora en que se trabajaron procesos y habilidades integradas en la competencia: cognitivas, metacognitivas y éticas. Fueron utilizados como instrumentos de medida el cuestionario CECAPEU y una rúbrica desarrollada ad hoc. Contrastando datos pretest-postest se encontraron mejoras estadísticamente significativas en puntuaciones de las dimensiones cognitiva, metacognitiva y ética del cuestionario, y de la rúbrica relacionadas con los contenidos del programa, en las tres dimensiones trabajadas. El alumnado participante valoró también positivamente el programa. Los resultados, positivos, confirman la eficacia del programa y animan a seguir en esta dirección, con programas integrados en las materias y con instrumentos de evaluación que incluyen la evaluación del uso de esta competencia en tareas auténticas.

Palabras clave: *aprender a aprender, educación basada en competencias, educación superior, programas educativos.*

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Resumo

A competência Aprender a aprender (AaA) foi proposta pela União Europeia (2006 e 2018) como competência-chave para a aprendizagem ao longo da vida. Esta competência é ensinada no ensino pré-universitário, mas há estudos que confirmam que os estudantes universitários não a dominam adequadamente. Neste trabalho, foi aplicado um programa educativo para ensinar a competência numa disciplina dos cursos de Pedagogia e Educação Social da Universidade de Valência. O objetivo era aumentar o nível de gestão da competência dos alunos. Foi utilizado um modelo quase-experimental pré-teste-pós-teste com uma amostra de 116 sujeitos pertencentes a 3 grupos experimentais e foram também recolhidos dados qualitativos. Foi concebido e aplicado um programa de formação, integrado na dinâmica docente da disciplina, com cinco sessões de cerca de uma hora, nas quais foram trabalhados processos e capacidades integradas na competência: cognitivas, metacognitivas e éticas. O questionário CECAPEU e uma rubrica desenvolvida ad hoc foram utilizados como instrumentos de medição. Contrastando dados pré-teste-pós-teste, foram encontradas melhorias estatisticamente significativas em pontuações das dimensões cognitiva, metacognitiva e ética do questionário, e da rubrica relacionadas com os conteúdos do programa, nas três dimensões trabalhadas. Os estudantes participantes também avaliaram positivamente o programa. Os resultados, positivos, confirmam a eficácia do programa e encorajam a seguir nesta direção, com programas integrados nas disciplinas e com instrumentos de avaliação que incluem a avaliação da utilização desta competência em tarefas autênticas.

Palavras-chave: *aprender a aprender, educação baseada em competências, ensino superior, programas educativos*.

摘要

"学会学习"（Aprender a Aprender, AaA）能力是欧洲联盟（2006 和 2018 年）提出的终身学习关键能力之一。尽管该能力在中小学阶段的教育中已有所涉及，但研究表明，许多大学生在这一方面的掌握仍然不足。本研究在瓦伦西亚大学教育学和社会教育学位课程中实施了一项教学计划，旨在提高学生对这一关键能力的掌握水平。研究采用了准实验设计，包括前测-后测的对比分析，研究样本为来自三个实验组的 116 名学生，同时还收集了定性数据。教学计划整合于课程教学中，分为五个时长约一小时的培训单元，主要涵盖"学会学习"能力的核心内容：认知、元认知和伦理技能。测量工具包括 CECAPEU 问卷和专为研究开发的评价量表。数据分析表明，实验组学生在认知、元认知和伦理三个维度的问卷得分，以及评价量表中与教学计划相关的内容得分均有显著性统计提升。参与学生对教学计划的效果给予了积极评价。研究结果验证了该教学计划的有效性，并强调通过将此类计划整合到课程教学中，以及使用包括实际任务能力评估在内的多元评估工具，有助于进一步推动学生对这一关键能力的掌握。

关键词：学会学习、基于能力的教育、高等教育、教育计划

ملخص

تم اقتراحها من قبل الاتحاد الأوروبي (2006 و2018) كمهارة أساسية للتعلم مدى الحياة. تُدرس هذه المهارة (AaA) "مهارة "التعلم للتعلم في مرحلة ما قبل الجامعة، إلا أن الدراسات تشير إلى أن الطلاب الجامعيين يعانون من نقص في إتقانها بالشكل المناسب. في هذا العمل، تم كان الهدف من. تطبيق برنامج تعليمي لتدريس هذه المهارة ضمن إحدى المواد في تخصصي التربية والتعليم الاجتماعي في جامعة فالنسيا شمل عينة مكونة من Pretest-Postest الدراسة تعزيز مستوى إتقان الطلاب لمهارة "التعلم للتعلم". تم اعتماد تصميم شبه تجريبي من نوع 116 طالبًا ينتمون إلى 3 مجموعات تجريبية، مع جمع بيانات نوعية لدعم التحليل. تم تصميم برنامج تدريبي ودمجه في العملية التعليمية للمادة، وتضمن خمس جلسات مدة كل منها حوالي ساعة، تم خلالها العمل على العمليات والمهارات المرتبطة بالمهارة، وهي: المهارات المعرفية، تم تطويرها خصيصًا (Rubric) وروبرك CECAPEU الماوراء معرفية (الميتامعرفية)، والأخلاقية. استخدمت أدوات قياس شملت استبيان، لوحظت تحسينات ذات دلالة إحصائية في درجات الأبعاد الثلاثة: المعرفية، الماوراء Pretest-Postest لهذا الغرض. عند مقارنة بيانات معرفية، والأخلاقية، سواء في الاستبيان أو الروبرك، وكلها متصلة بمحتوى البرنامج، مما يشير إلى نجاح البرنامج في تحسين هذه الأبعاد لدى قيّم الطلاب المشاركون البرنامج بشكل إيجابي. تؤكد النتائج الإيجابية فعالية البرنامج وتشجع على الاستمرار في هذا النهج، من خلال. الطلاب .تطوير برامج مدمجة في المواد الدراسية واستخدام أدوات تقييم تشمل قياس استخدام هذه المهارة في المهام الواقعية

الدالة الكلمات: ألتعلم للتعلم، التعليم القائم على الكفاءات، التعليم العالي، البرامج التعليمية.

Introduction

"Learning to Learn" (LtL) has been written since approximately the 1980s. It is a concept grounded in cognitive psychology/information processing theory (learning strategies/strategic learning), and in the socio-cognitive approach (self-regulated learning) (Pintrich, 2004; Weinstein, Husman & Dierking, 2000; Zimmerman, 2000). LtL is not a tautological term: to learn is also to learn and, to affirm that someone has learned to learn, it is necessary that (s)he manages cognitive, metacognitive and affective-motivational strategies with good performance.

The LtL construct was initially based on these three classic dimensions (Weinsten, 1988; Weinstein & Mayer, 1985). Later a fourth one was added, the social-relational dimension, anchored in the socio-cognitive approach (Hadwin, Wozney & Pontin, 2005; Järvelä et al., 2019; Zimmerman, 2000).

In 2006, people started to talk about the LtL competence", because the European Union (EU) formulated LtL as one of the key competences for the education system (EC, 2006) by interpreting it as a set of knowledge, skills and attitudes. They form part of three dimensions, cognitive, metacognitive and affective, and mention some socio-relational aspects.

Subsequently, the European Commission (EC) reformulated it by extending the object as the "Personal, Social and Learning Competence" (EC, 2018), which included a wider repertoire of the components that were not collected in the previous proposal: it is not only LtL, but also being personally and socially competent. Therefore, elements that have to do with personal and social development are included (Caena, 2019; Sala et al. 2020).

The topic has interested researchers in terms of theoretical clarification and for the modeling of competence and evaluation. Much less work has been done on teaching. It is worth noting, among others, the texts by Caena (2019), Caena and Stringher (2020), Hautamäki et al. (2002), Hoskins and Fredriksson (2008), Muñoz-San Roque et al. (2016), Pirrie and Thoutenhoofd (2013), Sala et al. (2020), Stringher (2014), Thoutenhoofd & Pirrie (2015) and Villardón-

Gallego et al. (2013). Some of these works have been done in tune with EU guidelines to facilitate them being embedded in the education system because the EU's intention is that students will have mastered the competence at the end of compulsory schooling, but this is more desire than reality.

The LtL competence is a meta-competence because it integrates highly relevant competences, such as information management, teamwork, learning planning and management, etc. For real and effective incorporation into education systems, it is essential to have a theoretical model that has been agreed on by the scientific community. Based on EC formulations, some relevant work has been carried out in Europe, such as that by Hoskins and Fredriksson (2008), who coordinated the work of the CRELL network (Centre of Educational Research for Lifelong Learning, EU) in an attempt to reach a consensus on a theoretical model and an evaluation protocol.

The CRELL network results failed to allow a consensus on a common European indicator to be reached and, thus, left the issue open.

Based on previous work, the GIPU-EA group (https://gipu.blogs.uv.es/) developed a theoretical model whose intention was to be comprehensive and integrative of the various LtL components, the MApA-CEMAS model (Gargallo et al., 2021), which includes five dimensions (Cognitive, Metacognitive, Affective-Motivational, Social-Relational and Ethical) and several subdimensions, which are shown in Table 2 (Autor et al., 2020). The first three derive from the theory of strategic and self-regulated learning, and the fourth from the theory of self-regulated learning, when the latter was more firmly grounded in the socio-cognitive approach to which it was always indebted. The fifth is a contribution of the research team and is based on the more recent EC formulation of competence and other research (Grace et al., 2017; Kass & Faden, 2018). A learner cannot be interpreted as competent in LtL by neglecting the ethical components involved in learning and self-improvement, and in the improvement of others.

Given its relevance, we defend that it is necessary to work systematically on the learning

and teaching of this competence in university degrees because its students, especially those in the first courses, do not sufficiently manage it (EI-ESU, 2012) and, at university, a high level of autonomy in the management of their own learning is essential (Lluch Molins & Portillo Vidiella, 2018). The data from some studies move in this direction (Cameron & Rideout, 2020; Furtado Rosa & Machado Tinoco, 2016; Morón-Monge & García-Carmona, 2022; Viejo and Ortega-Ruiz, 2018).

For the teaching of strategic and self-regulated learning, several proposals have been developed at university, which also serve to work on some of the competence's components.

1. Specific intervention programmes in which relevant LtL elements outside subjects are worked on. There is plenty of literature that refers to the programmes applied at primary and secondary schools, and some at university: Rosàrio et al. (2007), Wolters et al. (2023).

2. Subjects/workshops of free students' attendance, which allow them to work on strategies and the competence's other components.

3. Compulsory instrumental subjects: generally in the first degree year, knowledge, strategies, skills and attitudes are taught, which are considered necessary for good learning at university.

4. Teaching is inserted in the curriculum of subjects through intervention programmes: in their subjects, teachers teach students to learn how to learn the subject.

All four options are plausible, but the fourth seems the most pertinent because it is both functional and can be consolidated as another element of the training curriculum.

In their subjects, the idea is that teachers teach the competence by working on its various components: strategies for handling information, communication skills, problem solving, teamwork, etc. To this end, creating a good design to work on the competence in the degree programme in question is critical.

Still as part of this last option, which is that we defend, there are two possibilities:

A first one would consist of working "from top down", from theory to teaching practice, by starting from the theoretical model of the competence, from the consideration of its dimensions and subdimensions, by selecting the relevant components for its work in both the subject and the classroom, and by specifying methods and tasks for its teaching/assessment.

A second one would follow the reverse path, "from bottom up", from facts, from teaching practice to theory. This would involve teachers analysing what is being worked on in the subjects in relation to the competence and how by paying attention to teaching and assessment methods (portfolios, questions, cases, problems, simulations, teamwork, expository methodology, essays, etc.), and clarifying which of the competence's components are already being worked on in some way, and to do so explicitly and in a formalised way.

To facilitate this orientation, we defend an aligned approach ("constructive alignment") (Biggs, 2005) in which competences, objectives, contents, learning outcomes, and teaching and assessment procedures, are aligned to cooperate to achieve quality learning (Ibarra-Sáiz et al. 2023). Thus a very functional approach is achieved, which makes teachers' work easier for the teaching and evaluation of this competence.

This is our option: to work the competence in a first-year subject (Theory of Education) of the degrees of Pedagogy and Social Education of the University of Valencia by choosing the portfolio as a teaching, learning and evaluation methodology, which has been used in the subject, to work on the especially relevant dimensions of the competence, which we later describe.

Based on all these previous considerations, the *overall objective* of this work is to increase students' level of managing the LtL competence of the aforementioned subject in two degrees of the education field with a training programme developed and applied in the subject using students' portfolio to do so.

This general objective is specified in the following *specific objectives*, which refer to the

processes and skills involved in learning through portfolios. They seek to improve:

1. Information management skills
2. Critical thinking
3. Written expression skills
4. Citation and bibliographic referencing system
5. Metacognitive skills
6. Ethical/deontological commitment

The hypotheses are the following:

1. The level of competence management will increase by improving the processes and skills corresponding to the functions trained in the programme.

2. Students' perception of the programme's goodness will be positive.

Method
Design

A mixed methods design with a quantitative and qualitative methodology was used, more specifically a sequential explanatory design (Creswell & Plano Clark, 2018). In this design, the quantitative phase is the first one and corresponds to a quasi-experimental design with the non-equivalent control group that employs pretests and posttests (Reichardt, 2019). In the qualitative phase, which follows the quantitative phase, a general qualitative research design was employed (Patton, 2015).

Participants

The sample of the quantitative part consisted of 116 subjects from three groups of the first year of two degrees taught at the Faculty of Philosophy and Educational Sciences of the University of Valencia: Pedagogy (40 students in Group A and 37 students in Group B), and Social Education (39 students in group C), with 104 females (89.65%) and 12 males (10.35%). Students' mean age was 19.47 years and the standard deviation was 1.976. One teacher (A) taught the subject in Group A and another teacher (B) in Groups B and C.

The sample of the qualitative part included seven students from the two pedagogy groups. The selection criteria were: they had to be from both groups (A and B) in proportion to enrollment (4 from Group A and 3 from Group B), proportionally females and males (6 females and 1 male); from each class, at least one high-performing student, a medium- performing student and a low-performing student in the subject had to be selected (3 high-performing students, 2 medium-performing ones and 2 low-performing ones). No students were selected from Group C to avoid making the group too large.

Instruments

Two evaluation instruments were used for the quantitative plot: the QELtLCUS questionnaire and a rubric.

The QELtLCUS questionnaire (Gargallo et al, 2021) consists of 85 items with a five-grade Likert-type scale that collect data on the five dimensions and subdimensions of the theoretical model. Table 2 contains the structure and reliability data.

Content validity was assessed by seven expert judges and construct validity by a confirmatory factor analysis (CFA) (Gargallo et al., 2021). The seven chosen judges were experts in research methodology, evaluation and learning (Bandalos, 2018), and were all university teachers. They received a document with the definition of the competence and the structure of the theoretical construct on which the questionnaire was based, prepared by the research team. The same document included the repertoire of items for all the competence's subdimensions and dimensions. Based on this document, judges assessed the content validity of the items and their grouping into dimensions, their intelligibility, univocality and location, on a scale from 1 to 5. The items with a mean of less than 4 points and those for which judges had discrepancies in the assessment (using Kendall's concordance test) were eliminated.

Table 1 shows the CFA fit indices. The proposed model indicates a good fit for almost all its indicators when considering the five dimensions. χ^2 is significant on the Cognitive, Affective and Motivational dimensions, but the literature warns about this circumstance (Hair et al., 2010) for several reasons: this indicator is sensitive to sample size, the number of indicators in the model, or the intersection of both. In addition, several authors (Hair et al., 2010; Kline,

2015) recommend using other indicators to assess fit, such as the root mean square error of approximation (RMSEA), the comparative fit index (CFI) and the root mean square residual (SRMR). Both the RMSEA and CFI show an excellent fit for being below .05 on all dimensions in the RMSEA Index and above .95 with the CFI index. With the SRMR Index, they also show an excellent fit, except for the Cognitive dimension, which comes close to the proposed threshold of .05, and is below .08 (Hu & Bentler, 1999).

Table 1. Indicators of adjustment of the LtL dimensions

Dimensions or scales	χ^2			RMSEA				
	χ^2	df	p	RMSEA	90% CI	Pclose	CFI	SRMR
Cognitive	1564.417	482	.000	.043	(.040-.045)	1.000	.954	.053
Metacognitive	63.122	50	.101	.015	(.000-.025)	1.000	.997	.030
Affective- motivational	288.564	98	.000	.040	(.034-.045)	.999	.966	.047
Social-relational	71.461	84	.833	.000	(.000-.010)	1.000	1.000	.032
Ethical	14.491	24	.935	.000	(.000-.006)	1.000	1.000	.023

Table 2. Structure and reliability data

1. COGNITIVE (items 1 to 33) 33 items α = .91 ω = .88	1. Effective data management α = .87 ω = .85	1.1. Searching for and selecting data α = .71; ω = .71
		1.2. Attention in class. Note taking α = .70; ω = .70
		1.3. Establishing connections between what is learning and what is learned α = .63; ω = .63
		1.4. Preparing and organising data α = .66; ω = .67
		1.5. Comprehensive memorisation α = .70; ω = .70
		1.6. Data retrieval α = .63; ω = .62
		1.7. Organising data to retrieve them in exams and pieces of work α =.56; ω = .56
	2. Communication skills α = .90 ω = .90	2.1. Oral communication/expression skills α = .85; ω = .86
		2.2. Communicating in foreign languages α = .88; ω = .88
	3. Using * ICT α = .75 ω = .76	
	4. Critical and creative thinking α = .77 ω = .77	
2. METACOGNITIVE (items 34 to 45) 12 items α = .90 ω = .85	5. Knowledge of objectives, evaluation criteria and strategies α = .72 ω = .72	
	6. Planning, organising and managing time α = .72 ω = .73	
	7. Self-evaluation, control, self-regulation α = .64 ω = .64	
	8. Problem solving α = .66 ω = .67	
3. AFFECTIVE AND MOTIVATIONAL (items 46 to 58) 16 items α = .86 ω = .87	9. Intrinsic motivation α = .72 ω = .72	
	10. Tolerating frustration/Resilience α = .63 ω = .63	
	11. Internal attributions α = .62 ω = .63	
	12. Self-concept, self-esteem, self-efficacy α = .73 ω = .74	
	13. Physical and emotional well-being α = .77 ω = .77	
	14. Anxiety α = .73 ω = .73	
4. SOCIAL/RELATIONAL (items 62 to 76) 15 items α = .90 ω = .90	15. Social values α = .75 ω = .74	
	16. Attitudes of cooperation and solidarity; interpersonal relationships α = .74 ω = .74	
	17. Teamwork α = .84 ω = .84	17.1. Working with and helping classmates α = .77; ω = .77
		17.2. Teamwork. Personal engagement α = .75; ω = .75
	18. Controlling environmental conditions α = .70 ω = .70	
5. ETHICS (items 77 to 85) 9 items α = .86 ω = .86	19. Social responsibility in learning α = .71 ω = .71	
	20. Values. Honesty and respect α = .78 ω = .78	
	21. Respecting ethical and deontological codes α = .71 ω = .71	

*Information and communication technologies

An *ad hoc* rubric was also used to evaluate the level of students' mastery of the competence elements worked on in the programme using a three-grade evaluation scale (low level; medium level 2; high level 3) (Table 3).

Table 3. Evaluated dimensions and subdimensions

Dimensions	Subdimensiones of first level	Subdimensions of second level
1. Metacognitive	1.1. Text planning and structuring	
	1.2. Self-assessment/ Self-regulation	
2. Cognitive	2.1. Data management	1.2.1. Searching, locating, selecting and classifying data
		1.2.2. Preparation of the data
		1.2.3. Organisation of data, coherence, construction and correction of the text
		1.2.4. Understanding and internalisation of data
		1.2.5. Presence of conceptual errors
	2.2. Written expression skills and formal aspects	2.2.1. Presentation
		2.2.2. Inclusion of portfolio components
		2.2.3. ICT management for formal aspects. Text formatting
		2.2.4. Written communication skills. Vocabulary registration and management.
		2.2.5. Citation and paraphrasing
		2.2.6. Citation system for bibliographic references
		2.2.7. Presence of bibliographic references
		2.2.8. Spelling and punctuation
		2.2.9. Compliance with deadlines
	2.3. Critical and creative thinking	
3. Ethical dimension. Responsibility in learning.	3.1. Honesty. Values.	

Table 4. Examples

Dimensions	Subdimensions and/or aspects to evaluate	Level 3. High (3)	Level 2. Medium (2)	Level 1. Low (1)
	PLANNING ELEMENTS ANT TEXT ORGANISATION			
METACOGNITIVE	1. Text Planning/ Structuring (Metacognition)	The text has a clear and coherent structure in which all its parts are recogniSable.	The text presents an unclear structure, with inconsistencies and lack of planning. Some parts of the text are missing.	Text with little structure or planning in which its parts cannot be clearly identified.
	2. Self-assessment/Self-Regulation (Metacognition)	Performs a solid and coherent self-assessment with critical appraisal of the work developed and with effective proposals for improvement.	The self-assessment of the work performed is superficial and limited, and provides some elements for improvement.	Self-assessment is not performed or is neglected and without relevant contributions to improve the task.

Examples of the rubric for the two subdimensions of the metacognitive dimension and the criteria used for the assessment are included upper.

For the qualitative plot, a focus group was held during which the participating students discussed several questions (Sim & Waterfield, 2019). That which interests us for this work is the following:

1. How do you rate the training activities done in Theory of Education to work on the LtL competence? Do they help you? Do you think that other things could be

done to work on the competence in the degree subjects?

Intervention and data collection procedure

We wish to specify that authorisation was requested from the Ethics Committee of the University of Valencia, which specified that this was not required for data collection and the processing for this type of research. However, the guidelines of this committee were taken into account for research with individuals: students were informed about the research objective and process and, before completing the questionnaire, they gave their informed consent for data use. Participation was voluntary and students completed the instrument by including demographic data, but not personal identification data.

The two teachers, A and B, applied the same training programme to teach the LtL competence during the same period.

The QELtLCUS questionnaire data were collected through the virtual classroom. Students answered the questionnaire at the beginning of November (pretest), together with the first portfolio delivery. Five intervention sessions lasting about 1 hour were held during class sessions. In mid-December, students answered it again (posttest), together with the second portfolio delivery.

Teachers evaluated students' portfolios using the rubric prepared for this purpose in both the pretest and posttest. To decrease differences in teachers' criteria, these two teachers and a third one, who taught the same subject with other groups, evaluated students' portfolios by taking the mean of their scores.

In December a focus group was held during the final teaching period of the subject. The session was recorded with participants' authorisation, and was transcribed. The results were analysed.

Data analysis

In the quantitative plot, tests of the significance differences of means were performed using the Wilcoxon test for related samples because distribution was not normal, and also given the rubric metric. This was done with SPSS 28.0 and by including effect size.

The data analysis strategy chosen for the related samples in each group was the Wilcoxon test because three comparison groups were processed (Reichardt, 2019). The adopted analysis strategy was determined according to the study objective: test whether the training programme had an effect on certain LtL dimensions. Therefore, it was not a matter of determining whether there were differences among groups in the posttest, but of knowing the change produced by the programme from the pretest to the posttest. Likewise, the analysis of the three groups was chosen for the posttest and a decision was made to separately analyse the three groups because all three were processed. It was found that there were no equivalents in either the pretest or posttest on some dimensions. Therefore, given the three groups' lack of equivalence, it was more appropriate to consider them separately in the analysis. Finally, it was necessary to take into account if difference appeared between the pretest and the posttest on a given dimension in the three groups, then the generality of the results increased.

η^2 was used for effect size, calculated from the z-value of the Wilcoxon test (Fritz et al., 2012). The considered η^2 index effect size thresholds were .01-.059 low, .06-.0139 medium and >= .14 large (Fritz et al., 2012).

In the qualitative plot, the data collected from the focus group session recording on the assessment of the intervention programme and students' suggestions were transcribed and processed for this article. The chosen analysis strategy was to select two expert judges for this purpose to compare two different perspectives in interpreting the text. These judges subjected the document to a content analysis to delimit categories of analysis, frequencies of responses and their interpretation by means of an inductive-deductive procedure of category concretion. For data processing, textual analysis matrices were devised to collect the relevant data provided by students.

The training programme

The programme was developed during five one-hour sessions. They were included in the class session, lasted 2.5 hours and were held between November and December 2022.

Theory of Education is a basic first-semester subject that addresses fundamental issues for the training of pedagogues and social educators.

Throughout the four-month period, students delivered two portfolios, a fundamental methodological element in the teaching/learning of the subject that collects evidence for student learning. Deliveries were evaluated by the teacher, who offered feedback to students so that they could improve them. A portfolio includes:

- Answers to the questions posed for topics, once they have been discussed in class

- Reports of the practical activities carried out in class.

- Report of the research work done in groups

- Metacognitive reflection questions

- Student self-assessment and co-assessment of group work based on public evaluation rubrics

The *objectives* pursued with the programme and training sessions were to improve the processes and skills corresponding to the competence's components involved in learning through portfolios.

The *contents* worked on during programme sessions were:

- Data management skills

- Critical thinking

- Written expression skills

- Citation of bibliographic references

- Metacognitive skills

- Ethical/deontological aspects

During most sessions, the followed dynamics consisted of working with anonymous student submissions from the previous year, two in each case, one of low-quality performance and another of good quality, which were analysed in pairs to assess their quality. Subsequently, sharing was carried out with the teacher's advice to build good-performance models, which were uploaded to the virtual classroom to be used by students in their daily work.

1st session: Analysis of the good and bad performance of class questions

2nd session: Search and selection of data

3rd sesión: Text writing. Formal aspects and Word Processor use

4th session: Comprehension, internalisation, critical and creative thinking

5th session: Evidence for metacognitive skills and use of ethical criteria

Table 5 shows the fundamental elements of sessions. We emphasise that apart from working on specific session contents during sessions, the above-mentioned contents were worked on.

Results

Quantitative results

For the QELtLCUS questionnaire

The Wilcoxon test for related samples was performed with an effect size estimation, as previously mentioned, to analyse whether there was a significant difference in the means between the pretest and posttest in groups A, B and C. We recall that, during the programme, we worked on the Cognitive dimension (data management skills), the Metacognitive dimension and the Ethical dimension.

Table 5. Descriptión of sessions

Sessions	Objectives	Specific contents	Activities	Materials	Quality criteria for performance	Product	Deliverables
1st session	To specify and internalise the general criteria for analysing texts written by students on the subject matter content.	Criteria for analysing written texts.	- Presentation of two examples of students' work from the previous year: one of high quality and one of low quality. - Critical analysis of texts in pairs by addressing two questions: What is good and what is bad? Why? - Group discussion with the whole class.	Written texts from two students from the previous year.	- The text is well-presented and well-formatted. - It has good writing with no spelling, grammar mistakes or inappropriate expressions. - It is clear and understandable. - It uses appropriate language to scientific standards, not purely colloquial. The vocabulary is technical and precise. - The text addresses the posed task or question. - It is based on bibliographic references and includes them. - It provides a good synthesis of key ideas. - It includes a critical analysis. - It is creative and offers relevant new ideas.	Document, created between students and the thge teacher with quality criteria for execution, which is uploaded to the virtual classroom.	Document with students' evaluation of the two presented texts, which is uploaded to the virtual classroom as an assignment.
2nd session	To specify and internalise the quality criteria for the search and selection of data.	Sources for oacquiring quality data. Criteria for searching and selecting data.	- Dialogue with students: Where do you obtain data? How? What do you do to determine if they are appropriate? - Based on the dialogue, identify suitable sources and criteria for searching and selecting data. - Conduct a class workshop on searching for data from quality sources using filters. Individual performance.	Document with the quality criteria for data searches. Texts from students from previous years.	- Data are published in reputable and reliable sources (books from reputable publishers, articles from good journals, quality blogs; those that substantiate what they state with references, studies, etc.). - Use of specialised databases. - Appropriate thesauri use. - With identifiable authorship. - With relevant data to the topic being discussed. - The source's discourse should be rigorous and substantiate claims. - It should present different well-supported viewpoints. - The text should include literature reviews for expansion.	Document, created between students and the teacher, with quality criteria for execution, which is uploaded to the virtual classroom.	Document with a screenshot of the search, which is uploaded to the virtual classroom as an assignment.
3rd session	To establish and internalise quality criteria, regarding formal aspects and text processing.	Quality criteria for the formal aspects of texts and Word Processor use.	- Delivery to students of a document with formal execution criteria. - Analysis, in pairs, of two texts: one with high-level performance and one with low-level performance. - Sharing in a large group. - In class, a formatting workshop is carried out on a text that is delivered without formatting.	Document with quality criteria for text writing in formal aspects. Texts of students from previous years. Text for formatting.	- Organisation of the document: cover page with the required format or an appropriate format if none is prescribed by the teacher (include course, title of the work, personal details, etc., to allow proper identification of the work and the author). - Table of contents. - Pagination. - Text formatting: indentations, full justification, line spacing, font type (Times New Roman or another). - Maintain the same font type unless there is a reason to do otherwise. Same color for the text, which should generally be black.	Document, created by the teacher, with quality criteria for performance, which is uploaded to the virtual classroom.	Document with a text that each student has formatted, which is uploaded to the virtual classroom.

4th session	To specify and internalise the quality criteria related to comprehension, internalisation, critical thinking and creativity.	Quality criteria related to comprehension, internalisation, critical thinking and creativity.	- Delivery to students of a document with criteria that demonstrate comprehension, internalisation, critical thinking and creativity. - Analysis, in pairs, of two texts: one with high-level performance and one with low-level performance. - Sharing in a large group.	Document with quality criteria related to comprehension, internalisation, critical thinking and creativity. Texts of students from previous years.	- Appropriately search and select data, which should come from various sources, using the criteria outlined during the second programme session. - Read the texts containing the selected data. Compare, understand, integrate. Write by starting with a draft. - Paraphrase, rather than simply copy, by integrating and making data your own. - Contribute, if possible, after internalising the topic from comparing various sources, to your own thinking, which can be critical; by evaluating the collected and developed data critically; and/or being creative, going beyond what is collected from others and adding new ideas of your own. - Always reread what you have written to improve it. Put yourself in the reader's position to assess if it will be correctly understood.	Document, created by the teacher, with quality criteria for execution, which is uploaded to the virtual classroom.	Document with a text written by each student, whose aim is to respect these criteria, which is uploaded to the virtual classroom as an assignment.
5th session	To specify and internaliae quality criteria related to the management of metacognitive skills and the use of ethical standards.	Quality criteria for evaluating the management of metacognitive skills. Quality criteria for evaluating ethical aspects.	- Delivery to students of a document with criteria that demonstrate good management of metacognitive skills (self-assessment) and another document with criteria for evaluating adherence to ethical aspects. - Analysis, in pairs, of two self-assessment tasks: one is well performed and one poorly performed. - Analysis, in pairs, of a text with high-level execution that shows ethical commitment through rigor, effort, absence of plagiarism, etc. - Group discussion with the entire class.	Document with quality criteria related to the management of metacognitive skills (self-assessment). Document with quality criteria related to ethical commitment. Texts of students from previous years.	Quality criteria to evaluate self-assessment: - Self-assessment is "self-assessment," not evaluation or assessment of the course, its methodology or the teacher. - Students critically evaluate the work they have done for the submission. - They account for their effort and commitment in completing tasks. - They assess what they have learned and what they have not learned. - They analyse the difficulties encountered in their work. - They make improvement suggestions for future submissions or tasks. Quality criteria for evaluating ethical commitment: - The work is submitted within the deadline. - It is a well-crafted text in terms of formal aspects (presentation, spelling, text formatting, etc.). - It is a well-crafted text in content terms (integration of concepts, coherent discourse, free of conceptual errors, etc.). - It reflects serious and conscientious work. - The author did not simply copy from other sources (copying and pasting), but developed their own discourse based on the used information sources. - The used sources are cited.	Documents, created by the teacher, with quality criteria for performance, which are uploaded to the virtual classroom.	Documents with a text created by each student, one for self-assessment (metacognitive skills) by adhering to the specified criteria, and another that meets the provided ethical criteria. They are uploaded to the virtual classroom as assignments.

Table 6. Difference in means in QELtLCUS

		A					B					C				
		Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2
1. Search and selection of data	Pre	3.73	0.58	-0.348	.728	.003	3.79	0.52	-0.315	.753	.003	3.21	0.69	-0.469	.639	.006
	Post	3.74	0.50				3.84	0.55				3.27	0.74			
2. Attention in class. Note taking	Pre	3.64	0.65	-1.422	.155	.051	3.78	0.75	-0.913	.361	.023	3.64	0.70	-2.055	.040	.108
	Post	3.76	0.81				3.69	0.85				3.92	0.80			
3. Making connections between what is being learned and what is learned	Pre	4.03	0.58	-0.374	.709	.003	4.20	0.64	-0.344	.731	.003	4.10	0.68	-0.329	.742	.003
	Post	4.00	0.64				4.18	0.75				4.04	0.74			
4. Data elaboration and organisation	Pre	4.18	0.67	-0.723	.47	.013	4.08	0.60	-2.533	.011	.173	4.11	0.55	-2.180	.029	.122
	Post	4.23	0.67				4.37	0.60				4.30	0.60			
5. Comprehensive memorisation	Pre	4.04	0.72	-0.598	.55	.009	3.95	0.80	-0.403	.687	.004	3.99	0.74	-0.550	.582	.008
	Post	4.09	0.58				3.99	0.87				3.94	0.70			
6. Information retrieval	Pre	4.01	0.63	-1.919	.055	.092	4.13	0.45	-0.697	.486	.013	3.91	0.47	-1.648	.099	.070
	Post	4.17	0.47				4.19	0.54				3.97	0.71			
7. Organisation of data for retrieval in exams and papers	Pre	3.58	0.83	-2.048	.041	.105	3.49	0.81	-1.091	.275	.032	3.33	0.82	-2.696	.007	.186
	Post	3.81	0.72				3.64	0.76				3.68	0.70			
8. Oral expression/communication skills	Pre	3.51	0.92	-0.631	.528	.010	3.47	1.01	-1.109	.268	.033	3.41	1.04	-0.231	.817	.001
	Post	3.59	0.73				3.57	0.92				3.42	1.02			
9. Communication in foreign languages	Pre	3.14	0.92	-2.91	.004	.212	3.30	0.87	-1.579	.114	.067	2.59	1.10	-3.368	.001	.291
	Post	3.42	0.85				3.45	0.91				2.96	1.01			
10. ICT management	Pre	3.57	0.84	-2.719	.007	.185	3.69	1.02	-1.139	.255	.035	3.38	0.89	-2.945	.003	.222
	Post	3.87	0.73				3.87	0.72				3.72	0.77			
11. Critical and creative thinking	Pre	3.81	0.60	-1.276	.202	.041	3.80	0.69	-1.157	.247	.036	3.71	0.64	-2.487	.013	.159
	Post	3.71	0.51				3.89	0.61				3.90	0.61			

		A					B					C				
		Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2
COGNITIVE DIMENSION	Pre	3.72	0.44	-2.273	.002	.129	3.76	.40	-1.457	.145	.057	3.53	.39	-3.309	.001	.279
	Post	3.83	0.31				3.86	.38				3.70	.45			
12. Knowledge of objectives, evaluation criteria and necessary strategies	Pre	4.00	0.38	-0.021	.983	.000	3.89	0.54	-1.390	.165	.052	3.50	0.78	-0.066	.948	.000
	Post	3.99	0.47				4.02	0.70				3.49	0.72			
13. 13. Planning, organization and time management	Pre	3.32	0.79	-0.21	.834	.001	3.24	0.91	-2.210	.027	.132	3.08	0.70	-2.326	.020	.139
	Post	3.33	0.91				3.52	0.91				3.38	0.83			
14. Self-assessment. Control. Self-regulation	Pre	4.04	0.61	-0.41	.682	.004	4.03	0.46	-0.834	.404	.019	3.88	0.45	-0.433	.665	.005
	Post	4.09	0.53				4.12	0.57				3.89	0.67			
15. Problem solving	Pre	4.03	0.51	-0.486	.627	.006	3.97	0.55	-1.757	.079	.083	3.79	0.64	-1.406	.160	.051
	Post	3.98	0.48				4.16	0.55				3.90	0.61			
METACOGNITIVE DIMENSION	Pre	3.845	0.40	-0.41	.967		3.78	0.45	-2.167	.030	.126	3.55	0.42	-2.195	.028	.120
	Post	3.847	0.45				3.95	0.51				3.66	0.52			
16. Intrinsic motivation	Pre	4.15	0.62	-1.6	.11	.064	4.10	0.65	-0.658	.511	.012	3.97	0.49	-0.322	.747	.003
	Post	3.94	0.76				4.20	0.55				3.91	0.80			
17. Tolerance to frustration. Resilience	Pre	3.31	0.87	-1.334	.182	.044	3.41	0.69	-1.397	.162	.053	3.22	0.76	-0.210	.834	.001
	Post	3.44	0.82				3.51	0.78				3.26	0.82			
18. Internal attributions	Pre	4.10	0.77	-0.833	.405	.017	3.86	1.00	-0.857	.392	.020	3.79	0.86	-0.296	.767	.002
	Post	4.19	0.66				3.77	0.97				3.76	0.74			
19. Self-concept. Self-esteem. Self-efficacy	Pre	4.05	0.54	-0.682	.495	.012	4.05	0.41	-0.363	.717	.004	3.89	0.50	-0.480	.631	.006
	Post	3.99	0.46				4.05	0.51				3.87	0.63			
20. Physical and emotional well-being	Pre	3.58	0.82	-1.17	.242	.034	3.59	0.91	-1.016	.309	.028	3.32	0.97	-0.530	.596	.007
	Post	3.43	0.76				3.71	0.79				3.42	0.94			
21. Anxiety Control	Pre	2.24	0.85	-0.333	.739	.003	2.64	1.09	-0.028	.978	.000	2.68	0.87	-0.012	.990	.000
	Post	2.28	0.99				2.68	1.03				2.74	1.06			
AFFECTIVE AND EMOTIONAL DIMENSION	Pre	3.55	0.42	-0.608	.543	.009	3.60	0.37	-0.618	.536	.010	3.47	0.46	-0.506	.613	.006
	Post	3.51	0.46				3.65	0.47				3.49	0.53			

		A					B					C				
		Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2
22. Social values	Pre	4.50	0.42	-0.678	.498	.011	4.47	0.51	-0.099	.921	.000	4.38	0.39	-0.836	.403	.018
	Post	4.43	0.52				4.44	0.57				4.44	0.51			
23. Attitudes of cooperation and solidarity; interpersonal relationships	Pre	4.73	0.37	-0.116	.908	.000	4.77	0.42	-0.103	.918	.000	4.63	0.39	-1.054	.292	.028
	Post	4.72	0.37				4.77	0.37				4.55	0.53			
24. Working with and helping classmates	Pre	4.35	0.52	-0.022	.982	.000	4.17	0.73	-1.665	.096	.075	4.20	0.55	-1.774	.076	.081
	Post	4.34	0.56				4.39	0.49				4.34	0.62			
25. Teamwork. Personal involvement	Pre	4.35	0.48	-0.429	.668	.005	4.30	0.67	-0.540	.589	.008	4.25	0.55	-0.341	.733	.003
	Post	4.39	0.52				4.35	0.54				4.28	0.58			
26. Control of environmental conditions	Pre	4.15	0.68	-1.414	.157	.050	4.16	0.51	-1.109	.268	.033	3.77	0.88	-1.463	.143	.055
	Post	4.01	0.63				4.24	0.59				3.91	0.87			
SOCIAL/RELATIONAL DIMENSION	Pre	4.41	0.35	-0.674	.500	.011	4.37	0.41	-0.910	.363	.022	4.24	0.37	-1.181	.238	.035
	Post	4.37	0.36				4.43	0.36				4.30	0.48			
27. Social responsibility in learning	Pre	4.17	0.52	-0.809	.419	.016	4.04	0.73	-0.144	.885	.001	3.85	0.57	-2.729	.006	.191
	Post	4.08	0.50				4.05	0.82				4.09	0.53			
28. Values. Honesty and respect	Pre	4.45	0.58	-1.489	.136	.055	4.49	0.56	-0.263	.793	.002	4.32	0.55	-0.264	.791	.002
	Post	4.34	0.54				4.51	0.46				4.33	0.60			
29. Respect for ethical and deontological codes.	Pre	4.31	0.53	-0.672	.501	.011	4.45	0.47	-0.270	.787	.002	4.26	0.53	-0.042	.967	.000
	Post	4.36	0.46				4.48	0.39				4.28	0.57			
ETHICAL DIMENSION	Pre	4.30	0.46	-1.016	.310	.025	4.32	0.47	-0.489	.625	.022	4.14	0.42	-1.912	.056	.093
	Post	4.26	0.40				4.34	0.43				4.23	0.45			

There were statistically significant differences on the Cognitive dimension and in the three groups (A, p<.05; B, p=.05 and C, p<.01), with improvement in the posttest, in Group A with a medium effect size, in Group B with a small one and in Group C a large one.

There were also statistically significant differences on the Metacognitive dimension in Group B (p<.05) and C (p<.05), with a medium effect size.

There were no statistically significant differences on either the Affective-Motivational or the Social-Relational dimension.

On the Ethical dimension, there were only differences in Group C (p=.05), with a medium effect size.

The results are quite consistent with what was expected given that the programme only worked on the elements of the Cognitive, Metacognitive and Ethical dimensions.

To further specify the effects of the programme, the results of the subdimensions are briefly commented on below.

On the *Cognitive dimension,* there were statistically significant differences in Data preparation and organisation in Groups B (p<.05) and C (p<.05), with a large effect size and in B and with a small effect one in C. There were none in Group A, which improved in the posttest. There was also improvement in Information Retrieval in two of the three groups: A (p=.05) and B (p<.05), with a medium effect size in both. Group C also improved, for which there was no significant difference. The same occurred in Data organisation for retrieval in Groups A (p<.05) and C (p<.01), with a medium and a large effect size, respectively. There were no differences in Group B, for which the mean in the posttest improved, and also for Communication in foreign languages in Groups A (p<.01) and C (p<.01) with a large effect size. Group B improved and showed no significant differences. In ICT Management, there were significant differences in Groups A (p<.01) and C (p<.01) with a large effect size.

Group B also improved and showed no statistically significant difference. Finally for Critical thinking, there were statistically significant differences in Group C (p<.05) with a large effect size. There was no difference in the other two groups, and the mean improved in Group B.

To summarise: the means in Group A improved on nine of the 11 subdimensions, and on four with statistically significant differences; in Group B, the means also improved in nine of the 11, with statistically significant differences in two; in Group C, the means improved on 10 of the 11, and five had statistically significant differences.

On the *Metacognitive dimension*, there were differences in Planning, organisation and management in Groups B (p<.05) and C (p<.05) with a medium effect size. In Group A, there was also improvement, but no statistically significant differences. There was also improvement in Self-assessment in all three groups; in Groups B and C, improvement was also noted for Problem solving, but it was not significant. In Knowledge of objectives, there was improvement in Group B, but it was not significant.

On the *Ethics dimension*, there were statistically significant differences in Social Responsibility in Group C (p<.01) with a large effect size, and a slight improvement in Group B with no statistically significant difference. For Values, there were improvements in Groups B and C, but with no statistically significant difference. For Respect, improvement was for ethical codes and in all three groups, but with no statistically significant differences.

Table 7. Difference of means in the rubric

DIMENSIONS	SUBDIMENSIONS	Items		A					B					C				
				Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2	Mean	SD	Z	Sign	η^2
METACOGNITIVE	PLANNING	Planning	Pre	2.77	.536	-1.811	.070	.09	1.86	.585	-5.745	.000	.89	1.51	.506	-6.245	.000	1.00
			Post	2.95	.229				2.76	.435				2.51	.506			
	SELF-ASSESSMENT	Self-assessment	Pre	1.82	.756	-4.756	.000	.565										
			Post	2.73	.508													
COGNITIVE	INFORMATION MANAGEMENT	Search	Pre	1.49	.506	-3.759	.000	.38	1.11	.315	-6.083	.000	1.00	1.00	.000	-6.245	.000	1.00
			Post	2.08	.722				2.11	.315				2.00	.000			
		Elaboration	Pre	1.56	.502	-3.523	.000	.34	1.11	.315	-5.292	.000	.76	1.00	.000	-4.472	.000	.51
			Post	2.08	.682				1.86	.585				1.51	.506			
		Organisation	Pre	1.67	.478	-2.858	.000	.22	1.11	.315	-5.292	.000	.76	1.00	.000	-4.472	.000	.51
			Post	2.05	.664				1.86	.585				1.51	.506			
		Understanding	Pre	1.64	.486	-3.266	.000	.29	.000	.585	-3.000	.000	.24	1.51	.506	-4.359	.000	.49
			Post	2.11	.658				2.11	.315				2.00	.000			
		Conceptual errors	Pre	1.56	.552	-3.589	.000	.35	1.86	.585	-3.000	.000	.24	1.51	.506	-4.359	.000	.549
			Post	2.22	.672				2.11	.315				2.00	.000			
	WRITTEN EXPRESSION SKILLS AND FORMAL ASPECTS	Presentation	Pre	1.62	.673	-3.465	.000	.32	1.11	.315	-5.292	.000	.76	1.00	.000	-4.472	.000	.51
			Post	2.24	.683				1.86	.585				1.51	.506			
		Inclusion of components	Pre	2.51	.790	-2.874	.000	.22	2.86	.347	-2.357	.000	.15	2.82	.451	-1.814	.070	.08
			Post	2.95	.229				2.59	.599				2.62	.673			
		ICT management	Pre	1.54	.720	-3.844	.000	.40	1.97	.687	-3.157	.000	.27	1.90	.718	-2.874	.000	.21
			Post	2.41	.725				2.43	.765				2.33	.662			
		Written communication	Pre	1.67	.478	-3.180	.000	.27	1.76	.435	-3.606	.000	.35	1.51	.506	-4.359	.000	.49
			Post	2.14	.713				2.11	.315				2.00	.000			
		Citation and paraphrasing	Pre	1.05	.223	-3.020	.000	.25	1.11	.315	-5.292	.000	.76	1.00	.000	-4.472	.000	.51
			Post	1.54	.836				1.86	.585				1.51	.506			
		Reference citation system	Pre	1.26	.442	-1.402	.161	.05	1.16	.501	-4.811	.000	.63	1.00	.000	-4.472	.000	.51
			Post	1.46	.836				1.84	.553				1.51	.506			
		Bibliographic references	Pre	1.27	.508	-1.572	.116	.07	1.16	.501	-4.939	.000	.66	1.00	.000	-4.234	.000	.46
			Post	1.51	.837				1.92	.640				1.59	.637			
		Spelling	Pre	1.49	.601	-4.730	.000	.60	1.73	.508	-1.633	.102	.07	1.51	.506		.000	1.000	.00
			Post	2.43	.689				1.86	.585				1.51	.506			
		Compliance with deadlines	Pre	3.00	.000	-1.000	.117	.03	2.86	.347	-2.357	.018	.15	2.82	.451	-1.814	.070	.08
			Post	2.95	.329				2.59	.599				2.62	.673			
	CRITICAL AND CREATIVE THINKING	Critical and creative thinking	Pre	1.36	.486	-4.261	.000	.49	1.11	.315	-5.292	.000	.76	1.00	.000	-4.472	.000	.51
			Post	2.00	.624				1.86	.585				1.51	.506			
ETHICS	HONESTY. VALUES. RESPONSIBILITY IN LEARNING	Honesty. Values. Responsibility	Pre	1.85	.489	-4.315	.000	.50	1.95	.664	-4.725	.000	.60	.000	.731	-4.704	.000	.57
			Post	2.70	.463				2.54	.691				2.46	.643			

From the Rubric

The Wilcoxon test was performed for related samples with an effect size estimation to analyse any possible pretest-posttest differences in groups. This instrument contains news of the subdimensions worked on in the intervention programme, as specified in the assessment items shown in the table. The self-assessment results are only provided in the A group. This is because it was not possible to collect Self-Assessment data with the first portfolio delivery in groups B and C, but it was possible during the posttest.

On the *Cognitive dimension*, there were statistically significant differences in the three groups for the five Information Management subdimension items (Search, Preparation, Organisation, Comprehension, Conceptual Errors) and for five of the nine items of the Written expression skills and formal aspects subdimension (Presentation, ICT Management, Written Communication, Citation and Paraphrasing, Inclusion of components), on the last subdimension in Groups A and B, but not in Group C. The effect size was large in all cases. In the Citation system and Bibliographic references, there were large effect sizes in B and C, but not in A, which also improved. For Spelling, they also appeared in A with a large effect size, but not in B and C. The score improved in B and was maintained in C. There were no improvements for Meeting deadlines. There were improvements in the only item of the Critical Thinking dimension (p<.001) with a large effect size.

Hence there were statistically significant improvements in the three groups, and for 12 of the 15 items of the Cognitive dimension, and there were improvements for two more in Group B.

On the *Metacognitive dimension*, there were statistically significant differences in Planning (Planning item) in Groups B and C (p<.001 in both groups) with a large effect size. There were none in A, but the score improved and

was close to the significance value. There was also a significant difference on the Self-assessment subdimension, evaluated by the Self-assessment item (p<.001), with a large effect size in Group A.

On the *Ethical dimension*, there were statistically significant differences in the three groups for the only item that evaluated it: Honesty. Values were p<.001 with a large effect size.

To summarise:

In Group A, the results improved on the Metacognitive dimension (subdimension Planning), on the Cognitive one (on the three subdimensions, Management, expression skills and Critical thinking, and for 12 of the 15 items) and also for the item of the Ethical dimension (of subdimension Honesty. Values), with improvements for 14 of the 18 items.

In Group B, the results improved on the Metacognitive dimension (Planning subdimension), on the Cognitive dimension (on the three subdimensions, Management, expression skills and Critical thinking, and for 14 of the 15 items) and also for the item of the Ethical dimension (of the Honesty. Values subdimension). Therefore, improvements appeared for 16 of the 18 items.

In Group C there were statistically significant improvements on the three subdimensions of the Cognitive dimension (Management, Expression skills and Critical thinking) and for 11 of its 14 items. The results also improved on the Metacognitive dimension (Planning subdimension) and for the Ethical dimension item (Honesty. Values subdimension) with large effect sizes.

Qualitative results of the focus group

As previously mentioned, the data obtained by recording the session were subjected to a content analysis by two expert judges to delimit categories of analysis, frequencies of responses and their interpretation using an inductive-deductive system of category concretion. Textual analysis matrices were

prepared to collect the relevant data provided by students. Given the spatial limits of this text, we do not include these, but only a brief summary of students' contributions that referred to the last question, which dealt with the programme's goodness and included literal texts (called A1, A2, etc., of the students from whom we collected verbal textual manifestations).

Students gave a positive evaluation of the programme, especially because good and bad examples of the tasks solved by other students from the previous year were presented, and for allowing them the opportunity to evaluate them with another classmate and, between both of them, to provide evaluation clues. They also reported that the subsequent group discussion in class with the teacher's contributions and the final synthesis of the quality criteria of performance helped them to improve their own performances (A5: "*Based on what you said about the texts you gave us, one was correct and the other was incorrect. When explaining it, you might be able to understand it. But if you visualise it, correct it with another classmate with who you can comment on it, and then also discuss it in class, I think that one way to improve this point is doing all this, which is what we mentioned before. Learning to learn is also what you do or practice to improve it. And then I can use it later*.")

A1: *"... I agree with what _____ says, with the fact that they explained it just as we've done here. Then that knowledge is incorporated because here you make a mistake or here you have some doubt, and you can ask your classmate or your teacher in class. So this helped you, as a student, to know how to solve it at that time and to better develop the skill you are acquiring..."*. A7: "*Yes, the correction of the line spacing method and all that with Word are complicated for me because I was used to another platform, and as a result of an activity we did in class, during these sessions, I realised how I could modify it. I also remembered that I talked to you and you solved my doubts, and I learned in that particular class. It helped me a lot.* A4: *"It has also helped me a lot to find data better and to*

present them because with activities it's a bit like being easier for me when seeing others' mistakes. Although I spend a long time, seeing my mistakes is difficult. But when looking at a text by someone else, I say this and that are wrong, which helps me to improve").

Group B also had to evaluate some of the work with the rubric used in the research, which is a demanding task, but a very one positive because of what was learned with it (A3: "*I wanted to share my opinion with _____ by highlighting the rubric work we did in your class ... It was really cool work, when we had to write a text, answer two questions, do two activities, and with a rubric with the objectives, and at a very high level. We also received a random work from one of our classmates, which we had to evaluate. It was very interesting because, by applying the rubric, we learned so much and we realised that we could do it much better. So we made lots of changeswith the methods that we were taught"*).

Discussion and conclusions

The *overall objective* was to increase the LtL competence level of the students in the three groups with the training programme by improving the processes and skills involved in learning through portfolios to be trained. As expected and hypothesised, such improvement occurred in all three groups.

In QELtLCUS, statistically significant differences in the three groups appeared from the pretest to the posttest in the mean scores on the Cognitive dimension and, as expected, the programme places special emphasis on it by training an important part of the skills that comprise it. As stated in the previous section, in A there were improvements for nine of the 11 subdimensions, four of which were statistically significant. In Group B, improvements appeared for in nine, two of which statistically significant, and for 10 of the 11, of which five were statistically significant in Group C.

In the rubric, there were statistically significant differences in the three groups for

the five items of the Data Management subdimension. There were also significant differences in five of the nine items of this subdimension: Written expression skills and formal aspects. There was a significant difference in the only item of the Critical thinking subdimension in all three groups.

The hypothesis was, therefore, verified, given the obtained improvements.

On the Metacognitive dimension, there were differences in QELtLCUS in Planning, organisation and management in Groups B and C, as mentioned in the previous section. In Group A, there was also improvement, but it was not statistically significant. All three groups improved in Self-assessment, and Groups B and C in Problem solving, but with no significant improvement. The same occurred in Knowledge of objectives in Group B.

In the rubric, there were statistically significant differences in the Planning item for Groups B and C). There were none in Group A, but the score improved and the difference came close to the significance value. There was also a statistically significant difference on the Self-assessment subdimension, which was assessed by the Self-assessment item (p<.001) in Group A.

On the Metacognitive dimension, the hypothesis was partially fulfilled with improvements, but not on all the subdimensions. This occurred in those worked on in the programme, but not in all the groups.

On the Ethical dimension of QELtLCUS, statistically significant differences appeared for Social Responsibility in Group C (p<.01), with slight improvement in Group B, but with no significant differences. There were also improvements in Values in Groups B and C, but they were not statistically significant, and in Respect for ethical codes for all three groups, albeit not statistically significant.

In the rubric, very statistically significant differences were observed in the three groups (p<.001) for Honesty, Values and Social Responsibility in learning, with improvement in the post-test and a large effect size.

With these data, it can be stated that the developed training programme is effective in working on the learning of this competence. This means that the first hypothesis is confirmed and along the expected lines.

The results of the evaluation made by the students who participated in the discussion group about the programme's goodness were also positive, which confirms the second hypothesis.

We found no data in the literature on programmes that specifically talk about the teaching of the "LtL" competence, but we obtained data on programmes that aim to improve LtL, learning strategies and/or self-regulated learning. We mention some, but not exhaustively so.

In the programme by Rosário et al. (2007) (´Letters from Gervasio`), students from two first-year degrees at the University of Oviedo (Spain) were trained in cognitive, metacognitive and support strategies, during six one-hour sessions, but not part of their regular classes. Using self-reports, they found an improvement in declarative knowledge of strategies, which was not statistically significant. A replication of the same programme (Hernández Pina et al., 2008) with third-year Pedagogy students at the University of Murcia (Spain) obtained similar results.

Another well-known programme is that of Mckeachie, Pintrich and Lin (1985) ('Learning to learn`), an introductory course for psychology students at the University of Michigan, which includes instruction in cognitive psychology, and also in cognitive, metacognitive and motivational strategies. At the end of that programme, the authors found significant improvements in a self-report of strategies and their use, as well as modest improvements in grades. Hofer, Yu and Pintrich (1988) replicated the course with first- and second-year psychology students using the MSLQ for assessment. They noted statistically significant differences in the seven cognitive strategies and in four of the six motivational

strategies assessed by the test. A subsequent application of the same programme (Hofer & Yu, 2003) with first- and second-year students obtained good results in improvement of learning strategies, as assessed by self-reports.

Wolters et al. (2023) applied a LtL programme (self-regulated learning) and strategy training with a sample of 331 volunteer students in the experimental group and 446 in the control group at a North American public university for one semester. Students were trained by doctoral students. The evaluation was made with a self-report questionnaire. Statistically significant improvements were found in the experimental subjects compared to the control subjects in self-efficacy, time management, metacognition, motivation and environmental management, but not in grades.

The programme by Nückles et al. (2009) was slightly different for using the writing of learning protocols (prompts) to enhance self-regulated learning, with questions that guided students' reflective process when solving academic tasks. Students had to develop their own protocols to guide their learning. The results reflected improvements in cognitive and metacognitive strategies.

The programmes referred to so far are extracurricular programmes, of a longer or shorter duration, and are more or less sophisticated depending on the context where they are applied.

As previously mentioned, our preferred option is the application of curricular programmes, integrated into the teaching of subjects. One example of this type of programme, which is much less common, is that of Norton and Crowley (1995), in which first-year students were trained in study skills and learning strategies as part of the psychology curriculum (at the Liverpool Institute of Higher Education). Students developed a more sophisticated conception of learning, and improved their skills and strategies, and also their academic performance.

Based on the results obtained by these programmes and their formats, we emphasise three aspects of our programme:

Firstly, improvements occurred not only in the QELtLCUS questionnaire, a questionnaire with a self-report format, but also in the evaluation rubric, and with more intensity. This rubric is used to assess students' actual performance in carrying out tasks, in this case the portfolio (authentic tasks and authentic assessment). Thus, it is an original programme that goes beyond what is usual in this type of programme, which tend to be limited, by assessing with students' self-reports.

Secondly, it is a training programme that is inserted into teaching, in the ordinary curriculum, which confers it greater functionality. This makes the teaching of the competence visible and explicit by including it in the curricular contents for its teaching, learning and assessment.

Thirdly, it is the same training programme, but is applied by two different teachers in three distinct groups from two degrees of the same university, which allows us to predict further successful applications, and this actually occurred in the present one. It is true that, in other groups of different degrees, adaptations will have to be made depending on the content of the applied subjects and methods, but the substantial programme elements can be used to work on the skills that were enhanced during this intervention. In subjects that employ the portfolio and aim to work on those same skills, the programme can be practically used as herein applied.

Finally, we are aware of some limitations in this work. The first one is the sample, which is not representative and not very large, and is limited to two Education degrees. The second one is the design type because it would be ideal to have equivalent control groups of the same subjects and same degrees, which is something that could not be carried out in the work done to date. However, we intend to achieve this while continuing with this project, which will soon finish its first year. Suggestions for continuing research are, therefore, a larger

sample size by increasing the number of experimental groups and including ontrol groups in the various educational intervention programmes for teaching the studied competence, which are being done in the project.

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