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Self-Assessment of Teamwork in Higher Education: Adaptation and Validation of the CATME-S to Spanish Version

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Abstract

Teamwork is one of the transversal skills to be acquired for an integral performance in life. Thus, higher education must address it effectively, but one of the great challenges of competence-based learning in higher education is the measurement of their acquisition. For this reason, to ensure an adequate competence acquisition, reliable instruments adapted to the particular context are needed. In this sense, one of the most used instruments to measure said competence is not translated or validated in Spanish. This study aimed to adapt and validate the Comprehensive Assessment of Team Member Effectiveness–Short (CATME-S) questionnaire on teamwork competence in a self-assessment version in a university population in the Basque Country. This research began with the questionnaire's back-translation and adaptation by two experts in educational research. The study involved 949 students pursuing bachelor's degrees in physical activity and sports sciences and primary education at a university in the Basque Country, Spain (381 women and 568 men aged 17–24 years: M = 20.5; SD = 1.5). A confirmatory factor analysis returned adequate goodness-of-fit indices, confirming the validity of the CATME-S scale measurement model. Therefore, it may be concluded that it represents a suitable tool for self-assessing teamwork competence in university students in the Basque Country.

Keywords

Teamwork, Comprehensive Assessment of Team Member Effectiveness (CATME), competency-based assessment, validation, self-assessment, university

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Autoevaluación del Trabajo en Equipo en Educación Superior: Adaptación y Validación de CATME-S al Castellano

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Resumen

El trabajo en equipo es una competencia clave, por lo tanto, es necesario abordarla y medirla de manera efectiva en educación superior. Por esta razón, se requieren instrumentos confiables y adaptados al contexto particular. Uno de los instrumentos más utilizados para medir la competencia de trabajo en equipo no está traducido ni validado al español. Este estudio tiene como objetivo adaptar y validar el cuestionario Comprehensive Assessment of Team Member Effectiveness-Short (CATME-S) sobre la competencia de trabajo en equipo en una versión de autoevaluación en la población universitaria del País Vasco. Esta investigación comenzó con la retrotraducción y adaptación del cuestionario por parte de dos expertos en investigación educativa. Han participado 949 estudiantes del grado en ciencias de la actividad física y el deporte y educación primaria en una universidad del País Vasco, España, (381 mujeres y 568 hombres de edades comprendidas entre 17 y 24 años: M = 20,5; DE = 1,5). Un análisis factorial confirmatorio arrojó índices de bondad de ajuste adecuados, confirmando la validez del modelo de medida de la escala CATME-S. Por tanto, se puede concluir que es un instrumento adecuado para autoevaluar la competencia de trabajo en equipo en estudiantes universitarios del País Vasco.

Palabras clave

Trabajo en equipo, Comprehensive Assessment of Team Member Effectiveness (CATME), evaluación en competencias, validación, autoevaluación, universidad

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According to the European Commission (2018), citizens need to develop the competencies of teamwork, decision-making and conflict management, as these skills are crucial from the social, employment and educational points of view (Crespí & García-Ramos, 2023). The term competence refers to the ability to overcome a challenge with success, for which cognitive resources, such as values, reasoning, attitudes, knowledge, micro-competencies and schemes of perception, evaluation and reasoning, must be exercised (Perrenoud, 2010). As pointed out by the European Commission (2018), nurturing citizens' teamwork competence is a priority, defined as the ability to relate to and integrate into a working group with a common goal (Atxurra & Villardón-Gallego, 2015; Barraycoa & Lasaga, 2010; Mora-Vicarioli & Hooper-Simpson, 2016). Teamwork involves implementing skills such as empathy, responsibility, interpersonal communication, conflict resolution, etc. (García-Garnica et al., 2023; Lower et al., 2017). The dynamic and multidimensional nature of teamwork makes it an elusive and difficult construct to study (Salas et al., 2000).

The optimal development of this competence is essential for integration into the labour market (De Prada et al., 2022; Robles, 2012), as organisational complexity implies working towards common goals (Nadal et al., 2015). The social ecosystem possesses a high level of competitiveness and innovation, making it necessary to respond quickly to challenges, to have specialised knowledge and, above all, to be immediately adaptable (Kozlowski & Ilgen, 2006). These needs can be met through teamwork (Kozlowski et al., 1999). However, little evidence exists on the level of acquisition of this competence, which is fundamental for continual learning throughout a professional career (De Prada et al., 2022). The assessment process is fundamental to measuring this acquisition, obligating teachers to plan the competencies they wish students to develop and consider not only how to teach them but also how to assess them (Sanz & Pedreño, 2011).

One way to assess this competence is through self-assessment (Loughry et al., 2007), a common assessment practice as indicated by teachers themselves (Noonan & Duncan, 2005). Moreover, self-assessment can improve the effectiveness and quality of the teaching and learning process (Topping, 2003). Yan et al. (2022) synthesised 626 effect sizes from 175 independent studies and found that using self-assessment as a means of evaluating the teaching-learning process had medium to large effects ($g = 0.585$) on academic performance. In another review, Youde (2019) analysed 19 studies from 1991 to 2017 and found an overall effect size of 0.46 on academic performance across all levels and subjects. However, this effect varies according to context, showing that students' beliefs or conceptions about themselves and learning can be a major factor in the self-assessment process, which in turn may impact the effect of self-assessment (Yan et al., 2023). In this vein, these beliefs have been shown to significantly influence students' learning behaviour (van der Kleij & Lipnevich, 2021). Brown (2011) concludes that students' conceptions of assessment influence student learning behaviour, affecting self-regulation and academic performance (Brown & Hirschfeld, 2008).

Not only self-beliefs but also context influences the process of self-assessment, in particular the people around the self-assessor (Andrade & Du, 2007; Harris & Brown, 2013). Similarly, Sargent et al. (2011) show that the classroom climate is a factor to consider when employing this type of assessment.

Another important predictor of self-assessment is students' perceptions of the usefulness of the process (Yan et al., 2023). Students with more positive beliefs about self-assessment report

that the practice has helped them take responsibility for the learning process, gain autonomy and self-confidence and work in a more organised, critical and analytical way (Bourke, 2014; van Helvoort, 2012; Siow, 2015). Relatedly, Tavsanli and Kara (2021) state that when students perceive self-assessment as fundamental for learning, their participation will be greater. Yan et al. (2020) highlight that self-efficacy, attitude, perceived control and psychological safety are predictors (among others) of how people cope with the process of self-assessment. In particular, motivation and self-esteem play very important roles in learning and assessment (Dweck, 1999). Therefore, it is important to develop students' confidence around skills and abilities to facilitate self-assessment (Butler & Lee, 2006; Wolffensperger & Patkin, 2013). In terms of self-regulation, according to Zimmerman and Schunk (2004), the more self-regulated the learning is, the more control students will take over their learning and the less dependent they will be on external support from the teacher. Therefore, if this process improves academic performance, and one of the competences that is messured in higher education (Villardón-Gallego, 2015) is the teamwork competence it can be understood that this improvement is also implied in this competence, but this should be measured with specific tools (Allen, 2000; Bain, 2006; Barberá, 1999; Dochy et al., 2002; McDonald et al., 2000).

Richardson et al. (2012) found in two meta-analyses that self-efficacy is the strongest predictor of academic performance in tertiary education, and a more recent study by Honicke and Broadbent (2016) also reports effect sizes of similar magnitude. According to Bandura (1997), this consists of beliefs in one's abilities to achieve goals. On this topic, gender plays a very relevant role in perceived efficacy, with different gender beliefs in leadership influencing self-evaluation (Kinnear & Ortlepp, 2016), particularly because women are more likely to experience criticism from peers (Ely et al., 2011; Heilman & Parks-Stamm, 2007), which affects their self-perception.

Incorporating the process of self-assessment with developing reflection and metacognition (Aguilar, 2013) stimulates learning (El-Koumy, 2010), and performing this self-assessment task provokes self-discovery and intellectual growth (Logan, 2015), which favour self-awareness (Harrison et al., 2015) and self-esteem (Bozkurt, 2020). In this line, the process develops skills related to critical thinking, self-regulation and problem-solving (Kiliç, 2016) and facilitates understanding of other people (Bourke & Tait, 2012), thus improving students' attitude towards their future work (Ferrándiz-Vindel, 2011). Notably, when students' self-assessment matches the assessment of their peers, it indicates a correct self-perception (Paunonen & O'Neill, 2010; O'Neill et al., 2019). Students whose self-assessment is more favourable than their peers' assessment of them tend to perform worse while team working (Atwater & Yammarino, 1992), whereas better-performing students tend to assesses themselves less favourably than do their peers (Lejk & Wyvill, 2001).

Therefore, a current challenge at the university level is adequately implementing student self-assessment of necessary competencies (Anson & Goodman, 2014; Carson & Glaser, 2010; Fellenz, 2006; Gransberg, 2010; King & Behnke, 2005). In regard to teamwork competence, various studies have demonstrated the usefulness of self- and peer-assessment (Britton et al., 2017; Carson & Glaser, 2010; Chapman & van Auken, 2001; Fellenz, 2006; Gransberg, 2010; Neus, 2011; O'Neill et al., 2019; Planas-Llado et al., 2018; Sergi, 2007; Thomas et al., 2011; Weaver & Esposto, 2012; Wen & Tsai, 2006). It is common for teamwork competence to be

assessed through rating the final product, but an acceptable result does not mean that the dimensions (contribution to teamwork, possession of relevant knowledge, skills and abilities (KSAs)…) of teamwork have been developed (Channon et al., 2017). Team members individually and collectively will most accurately assess the develop teamwork competence, as they are the direct, involved observers (O'Neill et al., 2019). Research has already demonstrated the usefulness of self-assessment in measuring teamwork competence (Thomas et al., 2011), which fosters students' learning by developing skills such as critical thinking, self-regulation and problem-solving (Kiliç, 2016). Various instruments use self-assessment for the purpose of evaluating teamwork (King & Behnke, 2005). These tools, which encourage reflection on one's own and colleagues' work, facilitate the assessment of teamwork competence (Anson & Goodman, 2014; Planas-Llado et al., 2018; Thomas et al., 2011; Villardón, 2006). Among these instruments are the Teamwork Competency Scale (TCS) (Hebles et al., 2022), the Teamwork Scale for Youth (Lower et al., 2017) and the Comprehensive Assessment of Team Member Effectiveness (CATME) (Ohland et al., 2012).

The TCS is based on Salas et al.'s (2005) 'big five of teamwork' model. Although it has a high degree of overlap with the CATME, the underlying model of this questionnaire assumes that team members will have the necessary skills and motivation to contribute effectively to the team, yet these are often key deficiencies in student teams (Ohland et al., 2012). For these reasons, the CATME-Short (CATME-S) was selected for this particular study for being valid and widely used for measuring teamwork competence. The CATME aims to measure teamwork competence through self-assessment and/or co-assessment and has proven effective in higher education students. Subsequently, Ohland et al. (2012) developed the CATME-S version, reducing the scale from 87 to 33 items to make it more pragmatic and easier to administer. Several studies have used the CATME-S for self-assessment (e.g. Braender & Naples, 2013; Ohland et al., 2012), but it has some limitations, one being its online format (Loughry et al., 2007), which prevents it being adapted to specific needs that may arise (Hastie et al., 2014). In addition, the original version of the CATME-S is in English, which makes it difficult to use outside the English-speaking world (Planas-Lladó et al., 2021).

To date, no study has adapted the CATME-S in its self-assessment version to Spanish for a university population. Thus, this study aimed to adapt and validate the CATME-S scale in a self-assessment version aimed at higher education in Spanish.

Methodology

Participants

This study used convenience sampling, selecting participants based on availability. A total of 949 students of physical activity and sports sciences and primary education at the University of Deusto, Basque Country, Spain, participated. They were aged 17–24 years ($M = 20.5$; $SD = 1.5$); 568 were male and 381 female. The study population covered all academic years and was distributed as follows: first year ($n = 282$), second year ($n = 200$), third year ($n = 221$), fourth year ($n = 163$) and fifth year ($n = 96$).

Instrument

The CATME-S (Ohland et al., 2012) comprises 33 items distributed in five factors, which have the following internal consistencies and organisation in their original English co-assessment version (Loughry et al., 2007): (a) contribution to teamwork, behaviors such as doing a fair share of the work and completing team assignments by the due date, 8 items (i.e., I completed the work in a timely manner) (Cronbach's alpha [α] = .96), (b) interaction with colleagues, this factor measures skills related to personal interactions, 10 items (i.e., I communicated effectively) (α = .95), (c) keeping the team on track, this factor measures the progress of the task and the focus on it, 7 items (i.e., I stayed aware of fellow team members´ progress) (α = .93), (d) commitment to quality, in this part, quality-related aspects are measured, 4 items (i.e. I believed that the team could produce high quality work) (α = .90) and (e) possession of relevant knowledge, skills and abilities (KSAs), in this part, aspects such as knowledge of the work of other colleagues are measured, 4 items (i.e., I had enough knowledge of teammates jobs to able to fill if necessary) (α = .91). A Likert-type scale with 7 response options was used in this study's adaptation, with 1 being *totally disagree* and 7 *totally agree*. The response options were extended from 5 to 7 to increases discrimination, and this has no psychometric impact (Dawes, 2008).

Procedure

The original version of the CATME-S scale is in English. To carry out the translation and adaptation process, a back-translation was done by a panel of experts in educational research. First, a person with a PhD in education and an expert in educational psychology translated the scale into Spanish. Then, under the supervision of another researcher with expertise in the field, the scale was adapted to the self-assessment version, that is, the writing of the items was adjusted for self-applying.. Finally, another person, a professor in education and an expert in educational methodology and evaluation, translated the version into English. These versions were checked by the panel of experts, and a consensus was reached on the final formulation of the items (Annex 1). To corroborate the validity of this translation and adaptation, a pilot study was carried out with 75 students in the second year of the degree in physical activity and sport sciences. In addition to successfully completing the scale, qualitative information was collected on the functioning of the tool and on the comprehension and clarity of the items. The results show that the instrument is understandable for a Spanish-speaking university population.

Once the instrument had been revised and tested, the version was employed with a sample of 949 students during the 2022–2023 academic year. For the application of the scale, an online space was created through the Qualtrics tool (Qualtrics, Provo, UT). First, the study's objective was explained along with the voluntary nature of participation and the confidentiality of the data, which was used exclusively for this research. The link to access the questionnaire was provided by email to the students as well as through a QR code in person in the classroom. The estimated time to complete the scale was 5–7 minutes.

As mentioned above, participation in this study was completely voluntary, and the students were informed of the possibility of leaving the study at any time and of the confidentiality of

all the information collected. This guaranteed compliance with the Declaration of Helsinki (World Medical Association, 2013). For these reasons, this research received a favourable report from the Ethics Committee of the University of Deusto, Basque Country, Spain.

Analysis

First, exploratory analyses were carried out by performing frequency distributions and calculating central and dispersion statistics (mean, standard deviation and skewness). Next, the validity and reliability of the measurements were assessed by performing confirmatory factor analyses and calculating internal consistency indices. The confirmatory factor analysis included a robust method (maximum likelihood estimation) with the Satorra-Bentler correction. These analyses were carried out using the Jamovi v. 2.4 application (Jamovi Project, 2023) and the module on structural equation modelling (SEM) (Gallucci & Jentschke, 2021).

Results

This section first describes the exploratory analysis (Table 1), then the confirmatory factor analysis (Table 2; Figure 1) in which goodness-of-fit indices were calculated and finally the calculation of the reliability indices (Table 3).

Exploratory Analysis

As shown in Table 1, the exploratory analyses yielded a mean of around 6 points and a standard deviation close to 1 point; the most frequent responses fell between 5 and 7. This indicates that the students had good perceptions of themselves in terms of teamwork competence, as the self-assigned scores are among the highest.

Table 1
Exploratory Analysis

Exploratory Analysis		N	M	SD	Skew.
C1	I did a fair share of the team´s work.	946	6.04	0.933	−1.976
C2	Fulfilled responsibilities to the team.	947	6.25	0.754	−1.360
C3	I completed the work in a timely manner.	946	6.19	0.745	−1.064
C4	I came to team meetings prepared.	946	6.26	0.866	−1.195
C5	I carried out the work thoroughly and accurately.	945	6.11	0.740	−0.749
C6	I made important contributions to the final teams final product	945	6.06	0.851	−1.093
C7	I kept trying when faced with difficult situations	944	5.87	0.883	−0.848
C8	I offered to help colleagues when it was appropriate.	945	6.14	0.853	−0.983
C9	I communicated effectively.	947	6.04	0.909	−1.054

Exploratory Analysis		**N**	**M**	**SD**	**Skew.**
C10	Facilitated effective communication in the team .	947	5.92	0.911	−0.866
C11	I exchanged information with teammates in a timely manner.	947	6.04	0.807	−0.858
C12	I encouraged the other team members.	948	5.83	1.023	−0.767
C13	I expressed enthusiasm about working as a team.	947	5.78	1.054	−1.106
C14	I heard what teammates had to say about issues that affected the team.	942	6.05	0.888	−1.036
C15	I got team input on important matters before going ahead.	943	5.86	0.946	−1.063
C16	I accepted feedback about strengths and weaknesses from teammates.	947	5.99	0.929	−0.935
C17	I used teammates to improve my performance	945	5.95	0.938	−0.954
C18	I let other team members help when it was necessary.	947	6.16	0.850	−1.218
C19	I stayed aware of fellow team members´ progress.	947	5.89	0.933	−0.976
C20	I assessed whether the team was making progress as expected.	947	5.70	0.997	−0.786
C21	I stayed aware of external factors that influenced team performance.	947	5.59	1.076	−0.945
C22	I provided constructive feedback to others in the team.	946	5.67	1.034	−0.726
C23	I motivated others on the team to do their best.	946	5.67	1.087	−0.875
C24	I made sure that everyone on the team understood important information.	944	5.81	0.942	−0.787
C25	I helped the team to plan and organize its work.	943	6.09	0.907	−1.116
C26	I expected the team to succeed.	946	6.11	0.830	−0.994
C27	I believed that the team could produce high quality work.	944	6.10	0.892	−1.230
C28	I believed that the team should achieve high standards.	944	6.04	0.902	−1.176
C29	I was cared that the team produced high quality work.	945	6.06	0.895	−1.328
C30	I had the skills and expertise to do excellent work.	944	5.88	0.864	−0.750
C31	I had the skills and abilities that were necessary to do a good job.	943	6.01	0.812	−0.904
C32	I had enough knowledge of teammates jobs to able to fill if necessary.	946	5.85	0.922	−0.926
C33	I knew how to do the work of other team members.	945	5.82	0.988	−0.918

Confirmatory Factor Analysis

The analysis of the goodness-of-fit indices yielded the following results. The Root Mean Squared Error of Approximation (RMSEA) returned a value of 0.053 (95% CI: 0.050, 0.056); Browne and Cudeck (1993) and Jöreskog and Sörbom (1993) indicate that a value of < 0.08 represents a reasonable fit, so our value of close to < 0.05 is a good fit. Continuing the analysis, the Standardised Root Mean Square Residual (SRMR) also yielded a value lower than 0.05 at 0.042. Regarding the tests on the incremental indices, the Tucker-Lewis Index (TLI) gave a value of 0.908, which indicates an acceptable fit according to Bentler and Bonett (1980); the Bentler-Bonett Normed Fit Index (NFI) returned a value of 0.886 and the Comparative Fit Index (CFI) a value of 0.916. Two of the values are above 0.9, and the NFI is almost at 0.9.

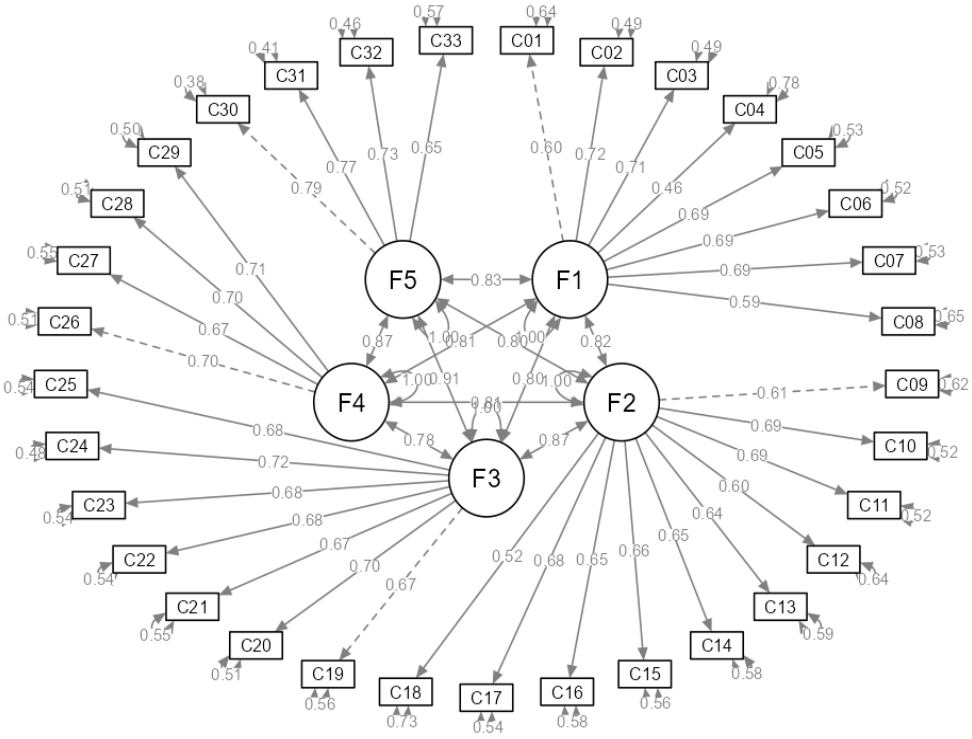
Table 2
Confirmatory Factor Analysis

Latent		Observed Estimate		*SE*	β	*z*	*p*
F1: Contributing to the team's work	C1	I did a fair share of the team´s work.	1.000	0.000	.603		
	C2	Fulfilled responsibilities to the team.	0.964	0.057	.720	16.914	< .001
	C3	I completed the work in a timely manner.	0.926	0.055	.714	16.824	< .001
	C4	I came to team meetings prepared.	0.715	0.060	.465	12.015	< .001
	C5	I carried out the work thoroughly and accurately.	0.901	0.055	.688	16.380	< .001
	C6	I made important contributions to the final teams final product	1.032	0.063	.692	16.450	< .001
	C7	I kept trying when faced with difficult situations	1.060	0.065	.685	16.334	< .001
	C8	I offered help to colleagues when it was appropriate.	0.898	0.061	.593	14.652	< .001
F2:Interacting with teammates	C9	I communicated effectively.	1.000	0.000	.579		
	C10	Facilitated effective communication in the team .	1.144	0.057	.666	19.912	< .001
	C11	I exchanged information with teammates in a timely manner.	1.033	0.065	.686	15.792	< .001
	C12	I encouraged the other team members.	1.143	0.080	.587	14.208	< .001
	C13	I expressed enthusiasm about working as a team.	1.286	0.086	.637	15.011	< .001
	C14	I heard what teammates had to say about issues that affected the team.	1.101	0.071	.662	15.412	< .001
	C15	I got team input on important matters before going ahead.	1.199	0.077	.669	15.534	< .001
	C16	I accepted feedback about strengths and weaknesses from teammates.	1.160	0.076	.655	15.313	< .001
	C17	I used teammates to improve my performance	1.228	0.078	.687	15.805	< .001

Latent		Observed Estimate		*SE*	β	*z*	*p*
	C18	I let other team members help when it was necessary.	0.852	0.065	.533	13.158	< .001
F3: Keeping the team on track	C19	I stayed aware of fellow team members progress.	1.000	0.000	.665		
	C20	I assessed whether the team was making progress as expected.	1.129	0.061	.698	18.381	< .001
	C21	I stayed aware of external factors that influenced team performance.	1.163	0.066	.667	17.681	< .001
	C22	I provided constructive feedback to others in the team.	1.153	0.064	.681	18.004	< .001
	C23	I motivated others on the team to do their best.	1.159	0.065	.666	17.726	< .001
	C24	I made sure that everyone on the team understood important information.	1.087	0.057	.722	18.934	< .001
	C25	I helped the team to plan and organize its work.	0.986	0.055	.682	18.019	< .001
F4: Expecting quality	C26	I expected the team to succeed.	1.000	0.000	.711		
	C27	I believed that the team could produce high quality work.	0.947	0.057	.612	16.601	< .001
	C28	I believed that the team should achieve high standards.	1.003	0.058	.642	17.415	< .001
	C29	I was cared that the team produced high quality work.	1.104	0.058	.709	19.179	< .001
F5: Having relevant KSAs	C30	I had the skills and expertise to do excellent work.	1.000	0.000	.789		
	C31	I had the skills and abilities that were necessary to do a good job.	0.916	0.038	.769	24.182	< .001
	C32	I had enough knowledge of teammates jobs to able to fill if necessary.	1.000	0.044	.735	22.869	< .001
	C33	I knew how to do the work of other team members.	0.963	0.048	.657	20.012	< .001

Figure 1

Confirmatory Factor Analysis



As shown in Table 2, 30 of the measured indicators have a standardised estimate above 0.6, with three indicators (C04, C08 and C18) being below 0.6 at some point. All of them show statistically significant relationships with the latent factors as seen in Figure 1. This confirms that the five-factor measurement model is valid. Figure 1 shows that the factors between them demonstrate correlations greater than or close to 0.8. The relationship between Factor 3, *Keeping the team on track*, and Factor 5, *Having relevant KSAs*, is noteworthy, standing at 0.91. In addition, Factor 4, *Expecting quality*, and Factor 5, *Having relevant KSAs*, show a correlation of 0.87 as do Factor 3, *Keeping the team on track*, with Factor 2, *Interacting with teammates*. Table 3 shows the internal reliability indices, α and omega (ω), which are also adequate.

Table 3
Reliability Indices

Variable	**α**	**ω₁**	**ω₂**	**ω₃**
F1: Contributing to the team's work	.844	0.848	0.848	0.855
F2: Interacting with teammates	.873	0.862	0.862	0.860
F3: Keeping the team on track	.859	0.859	0.859	0.853
F4: Expecting quality	.791	0.725	0.725	0.724
F5: Having relevant KSAs	.823	0.822	0.822	0.819

Discussion

This study aimed to adapt and validate the CATME-S scale in a self-assessment version for higher education in Spanish. In choosing, adapting and validating this scale, the guidelines of Morales-Vallejo (2006) were followed; the various existing tools were reviewed, taking into account the characteristics that had been studied previously.

The descriptive analyses show a slightly higher mean than the scale mean (6 out of 7). Previous studies with students of higher education level follow this trend, with an average of 4.5 out of 5 in the original validation of the CATME-S (Ohland et al., 2012) and averages of 4 out of 5 in validations of other scales measuring this competence (Hebles et al., 2022, Lower et al., 2017). In this case, it is shown how teacher education students tend to scored higher in competences that involve other people, such as teamwork (Gustems & Calderon, 2014). This also may be due to the 'above average effect', which refers to the tendency of individuals to believe that they are above average (Dunning et al., 1989). These tendencies in self-assessment are a challenge in interpreting the results of self-administered tests.

The analyses of the goodness-of-fit and internal consistency indices show that the instrument has adequate psychometric properties. This confirms the validation of the CATME-S scale in higher education in Spanish. In the original validation of the scale, the goodness-of-fit indices were as follows: RMSEA = 0.07, CFI = 0.94 and NFI 0.7. In this study, the results were RMSEA = 0.053, CFI = 0.916 and NFI 0.886. As can be seen, the CFI and NFI indices are similar, but the RMSEA in this study is closer to a perfect fit (Browne & Cudeck, 1993; Jöreskog & Sörbom, 1993). As for the reliability of the α coefficient, the results of this study indicate a lower reliability than in the original study, in which this coefficient is above 0.90 as described in the methodology section. In the present validation it is around 0.85 as shown in Table 3.

The scales validated to measure this competence in the latest research are the Teamwork Scale for Youth (Lower et al., 2017) and the TCS (Hebles et al., 2022). Regarding goodness-of-fit indices, the former has an RMSEA of 0.47, very close to that of this study, an identical SRMR index and a higher CFI at 0.984; in the TCS, only the SRMR index, which is 0.025, can be observed. Comparing the reliability indices (α) of the validated tools, the factors show a higher range of reliability in the present study than in the TCS validation, ranging from α = .791 to .873 and from α = .680 to .810, respectively. They are also higher than the pre-test of the Teamwork Scale for Youth, which gave a value of α = .785. All factors of the validated scale in this study yield values higher than α = .79, and values from .71 to .98 can be considered to be moderate to excellent (Sánchez-Meca et al., 2016).

As mentioned under the Instrument heading, the adaptation of the scale involved converting the 5-item CATME-S scale (Ohland et al., 2012) into a 7-item version for this study following the line marked by the authors of CATME (Loughry et al., 2007) in a preliminary study, taking into account that the change does not involve significant psychometric changes (Dawes, 2008) and increases the discrimination of the results.

One limitation of this study is its geographical homogeneity, as, for reasons of project feasibility and convenience, the sample was drawn from a single university. In this vein, the context (Andrade & Du, 2007) influences the person undertaking the self-assessment process. Likewise, the students' perception of its usefulness (Yan et al., 2020) considerably influences their self-assessment, and their possible perception of its lack of usefulness may represent

another limitation in this case. As a future line of research, it would be advisable to compare the results of self-assessment with the assessments of the various agents involved in the teaching-learning process, such as peers. It would also be interesting to analyse the evaluation process both in the self-assessment format and in the co-assessment format with other socio-demographic variables, such as gender, academic year, etc.

This research adapted and validated the CATME-S scale in a self-assessment version in Spanish. It contributes to the field of teamwork competence assessment in higher education, offering a valid tool for measuring this competence, which is fundamental for the personal and professional development of European students.

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Annexes

Annex 1. Items of the CATME-S in the Spanish version.

Instrucciones para rellenar del cuestionario:

Este cuestionario es de autoevaluación y tiene como objetivo recopilar información sobre su autopercepción de la competencia de trabajo en equipo. Consta de 33 afirmaciones, y para cada una de ellas deberá seleccionar la opción que mejor refleje su grado de acuerdo o desacuerdo.

Por favor, lea cada afirmación cuidadosamente y elija una respuesta en la escala del 1 al 7, donde:

1 = Totalmente en desacuerdo
2 = Muy en desacuerdo
3 = En desacuerdo
4 = Neutral
5 = De acuerdo
6 = Muy de acuerdo
7 = Totalmente de acuerdo

No hay respuestas correctas o incorrectas; lo importante es su opinión. Contestar el cuestionario le llevará aproximadamente 10 minutos.

Instrucciones para analizar el resultlado:

El cuestionario consta de 5 dimensiones: 1- Contribución al trabajo de equipo, 2- Interacción con los compañeros, 3- Mantenimiento del rumbo del equipo, 4- Compromiso con la calidad, 5- Posesión de conocimientos, destrezas y habilidades relevantes. La distribución de los ítems por factores es la siguiente; el primer factor lo componen los ítems 1-2-3-4-5-6-7-8 ítems, el segundo los ítems 9-10-11-12-13-14-15-16-17-18, el tercero los ítems 19-20-21-22-23-24-25, el cuarto los ítems 26-27-28-29 y el quinto 30-31-32-33.

1. Realicé una proporción justa del trabajo de equipo	1	2	3	4	5	6	7
12. Cumplí las responsabilidades con el equipo	1	2	3	4	5	6	7
3. Realicé el trabajo de manera oportuna/adecuada	1	2	3	4	5	6	7
4. Vine a las reuniones de equipo preparado	1	2	3	4	5	6	7
5. Realicé el trabajo de forma completa y precisa	1	2	3	4	5	6	7
6. Hice contribuciones importantes al trabajo final del equipo	1	2	3	4	5	6	7
7. Perseveré cuando encontramos dificultades	1	2	3	4	5	6	7
8. Ofrecí ayuda a los compañeros cuando fue necesario	1	2	3	4	5	6	7
9. Me comuniqué efectivamente	1	2	3	4	5	6	7
10. Facilité comunicaciones efectivas en el equipo	1	2	3	4	5	6	7

11. Intercambié información con los compañeros de forma oportuna/adecuada	1	2	3	4	5	6	7
12. Animé a los otros miembros del equipo	1	2	3	4	5	6	7
13. Mostré entusiasmo por trabajar como un equipo	1	2	3	4	5	6	7
14. Escuché a los compañeros sobre los aspectos que dijeron que afectaban al equipo	1	2	3	4	5	6	7
15. Recibí aportes del equipo en asuntos importantes antes de continuar	1	2	3	4	5	6	7
16. Acepté retroalimentación/feedback sobre mis fortalezas y debilidades de mis compañeros de equipo	1	2	3	4	5	6	7
17. Usé el feedback de mis compañeros para mejorar mi ejecución/rendimiento/trabajo	1	2	3	4	5	6	7
18. Permití que otros miembros del equipo ayudasen cuando fue necesario	1	2	3	4	5	6	7
19. Me mantuve al tanto del progreso de los miembros del equipo	1	2	3	4	5	6	7
20. Evalué si el equipo estaba progresando como se esperaba	1	2	3	4	5	6	7
21. Estuve atento a factores externos que influyeran la ejecución/rendimiento/trabajo del equipo	1	2	3	4	5	6	7
22. Ofrecí feedback constructivo a otros en el equipo	1	2	3	4	5	6	7
23. Motivé a otros en el equipo para dar lo mejor de sí	1	2	3	4	5	6	7
24. Me aseguré que todos en el equipo comprendiesen información importante	1	2	3	4	5	6	7
25. Ayudé al equipo a planificar y organizar el trabajo	1	2	3	4	5	6	7
26. Me comprometí para que el equipo tuviese éxito	1	2	3	4	5	6	7
27. Creí que el equipo podría producir un trabajo de alta calidad	1	2	3	4	5	6	7
28. Creí que el equipo debía alcanzar niveles altos	1	2	3	4	5	6	7
29. Me preocupé de que el equipo produjese un trabajo de alta calidad	1	2	3	4	5	6	7
30. Demostré las habilidades y pericia para hacer un trabajo excelente	1	2	3	4	5	6	7
31. Demostré las habilidades que eran necesarias para hacer un buen trabajo	1	2	3	4	5	6	7
32. Demostré suficiente conocimiento sobre los trabajos de los compañeros para ayudar si era necesario	1	2	3	4	5	6	7
33. Conocía como hacer el trabajo de otros miembros del equipo	1	2	3	4	5	6	7