Development and validation of an instrument to collect students' perceptions of upper secondary education programmes*

Ana Cristina Torres
CIIE - Centro de Investigação e Intervenção Educativas, FPCEUP,
Universidade do Porto. Portugal.
acctorres@fpce.up.pt
0000-0002-9068-1203

Received: 29/11/2024
Accepted: 23/5/2025
Published: 30/7/2025

Recommended citation: Torres, A. C. (2025). Development and validation of an instrument to collect students' perceptions of upper secondary education programmes. *Educar, 61*(2), 445-461. <https://doi.org/10.5565/rev/educar.2365>

Abstract

This article details the design and validation of the Students' Perceptions of Upper Secondary Education Programmes (SPUSEP) instrument, developed to explore Portuguese students' experiences of transitioning into upper secondary education. The instrument was developed based on a literature review and focus group discussions with students from four upper secondary schools and was tested through a pilot study with 185 students attending the 1st year of upper secondary level in these schools. Reliability and validity were assessed using Cronbach's alpha and a Principal Component Analysis. Furthermore, an independent sample T-test was conducted to examine differences between students in scientific-humanistic and VET programmes, as well as between general and VET schools. The results confirm that SPUSEP is a robust and reliable tool for gathering insights into students' perceptions of upper secondary education programmes. It captures effectively the various perceptions of different pathways, including concerns about course load, degree of subject choice and learning experiences. SPUSEP can support discussions about and reforms of upper secondary education programmes at institutional, local or system levels, to promote more informed and student-centred educational improvements.

Keywords: upper secondary; vocational education; general education; survey; educational transitions; programme of education or training

* This work was partially co-funded by national funds, through the Portuguese Foundation for Science and Technology (FCT) under the multi-annual funding awarded to CIIE [grants UIDB/00167/2020 and UIDP/00167/2020]. Ana Cristina Torres also acknowledges FCT funding for her contract established under the transitional rule of Decree-Law 57/2016, amended by Law 57/2017 (SFRH/BPD/108950/2015).

Resum. *Desenvolupament i validació d'un instrument per recollir les percepcions dels estudiants sobre els programes d'educació secundària superior*

Aquest article presenta el disseny i la validació de l'instrument «Percepciones de los estudiantes sobre los programas de educación secundaria superior» (SPUSEP), creat per investigar les experiències dels estudiants portuguesos en la seva transició a l'educació secundària. L'instrument es va elaborar a partir d'una revisió bibliogràfica i de grups de discussió amb alumnes de quatre centres d'ensenyament secundari superior i es va posar a prova mitjançant un estudi pilot amb 185 alumnes de primer curs de secundària superior dels centres esmentats. La fiabilitat i la validesa de SPUSEP es van avaluar mitjançant l'anàlisi alfa de Cronbach i l'anàlisi dels components principals. A més, s'ha fet una prova t de mostres independents per analitzar les diferències entre els estudiants de programes cientificohumanístics i els de formació professional (FP), així com entre escoles generals i d'FP. Els resultats indiquen que SPUSEP és una eina fiable per recopilar les percepcions dels estudiants sobre els programes d'educació secundària superior, ja que reflecteix diferències en la càrrega del curs, la selecció subjectiva i les experiències d'aprenentatge. Aquest instrument pot facilitar debats i reformes en els programes educatius en promoure millores més informades i centrades en l'estudiant a escala institucional i local.

Paraules clau: ensenyament secundari; formació professional; ensenyament general; enquesta; transicions educatives; programa d'educació o formació

Resumen. *Desarrollo y validación de un instrumento para recoger las percepciones de los estudiantes sobre los programas de educación secundaria superior*

Este artículo presenta el diseño y la validación del instrumento «Percepciones de los estudiantes sobre los programas de educación secundaria superior» (SPUSEP), creado para investigar las experiencias de estudiantes portugueses en su transición a la educación secundaria superior. El instrumento se elaboró a partir de una revisión bibliográfica y de grupos de discusión con alumnos de cuatro centros de enseñanza secundaria superior, y se puso a prueba mediante un estudio piloto con 185 alumnos de primer curso de secundaria superior de dichos centros. La fiabilidad y la validez del SPUSEP se evaluaron mediante el análisis alfa de Cronbach y un análisis de los componentes principales. Además, se realizó una prueba t de muestras independientes para analizar diferencias entre estudiantes de programas científico-humanísticos y de formación profesional (FP), así como entre escuelas generales y de FP. Los resultados indican que SPUSEP es una herramienta fiable para recoger las percepciones de los estudiantes sobre los programas de educación secundaria superior, ya que refleja las diferencias en la carga de los cursos, la elección subjetiva y las experiencias de aprendizaje. Este instrumento puede facilitar debates y reformas en los programas educativos al promover mejoras más informadas y centradas en los estudiantes a escala institucional y local.

Palabras clave: enseñanza secundaria; formación profesional; enseñanza general; encuesta; transiciones educativas; programa de educación o formación

Summary

1. Introduction

Upper secondary education systems vary from highly specialized tracks and study programmes to more unified programmes emphasizing transferable skills (Câmara Leme et al., 2020; Stronati, 2023, 2024). Specialization in vocational fields or subject groups may align with career goals but requires careful management to maintain quality and coherence (Santos, 2023). Offering some choice helps students tailor pathways to their aspirations, but socioeconomic backgrounds heavily influence decisions and often perpetuate inequalities relating to the differentiated prestige and opportunities in different pathways (Câmara Leme et al., 2020; Traqueia et al., 2020).

Striking a balance is key: excessive choice risks fragmentation and limits flexibility, while rigid systems may stifle student potential and adaptability in evolving employment markets (Hanushek et al., 2017; Doroftei & Silva, 2024). Thoughtful design is essential to ensure equity, adaptability and alignment with students' needs and social demands. Moreover, engaging students in such design at the policy level may favour more balanced curricula, address disparities and enhance quality (Azevedo, 2019), while also promoting students' rights to participation and active citizenship (Lundy & Cook-Sather, 2016; Pereira et al., 2014).

In Portugal, specialization and choice are particularly challenging in the transition to upper secondary education. In a highly specialized system (Câmara Leme et al., 2020), students enter a three-year programme (grades 10 to 12) with little opportunity to change courses or pathways without falling behind. Previous studies using various methodological approaches have explored students' academic, procedural and social difficulties during this transition (Torres & Mouraz, 2015, 2019; Torres, 2017), and have found that students struggle with longer class hours, a faster pace of teaching, heavier academic workload and heightened pressure for autonomy and performance in assessments (Torres & Mouraz, 2019; Torres, 2017). Sociological research has examined motives for enrolment, engagement and expectations of success, and reasons for programme changes among those switching course (DGEEC, 2018; Teixeira & Flores, 2010). However, in a system with highly specialized upper secondary pathways, students' perceptions of the structure and delivery of education programmes remain underexplored. Existing instruments largely target expectations around school transition, academic challenges and adjustments in social relationships and support (Akos & Galassi, 2004; De Wit et al., 2010), or focus on subject- or skill-specific contexts (Kokotsaki, 2017). Akos and Galassi (2004) examined the perceptions of students, parents and teachers but discussed academic struggles only in terms of content difficulty and workload. Dou and Shek's (2022) study in Hong Kong explored students' interest in a new curriculum that emphasized noncognitive skill development such as self-understanding and positive values. Importantly, few instruments allow quick completion and effective capture of broad student perceptions on how curricula align with their interests and aspirations, which

limits their utility for large-scale evaluations. These challenges mirror those in other specialized systems such as Germany and Spain (Câmara Leme et al., 2020), underscoring the international importance of capturing student perceptions. To address this gap, we developed an instrument to capture Portuguese students' perceptions of upper secondary education programmes, particularly during their entry into this more specialized stage of their education. Developed from a literature review and focus groups with 10th-grade students (Torres & Mouraz, 2015, 2019; Torres, 2017), the instrument was here validated for internal structure. The study supports discussions on coherence, specialization and choice within upper secondary programmes, and facilitates the inclusion of student voices. Additionally, the study seeks to connect students' perceptions of their experiences to curricular policies and reforms at national, local and school levels, contributing to more responsive and democratic educational practices.

1.1. Upper secondary education in Portugal

Despite placing differing emphases on social inclusion and educational quality, recent educational policies in Portugal have consistently aimed to improve youth and adult qualifications by enhancing skills and readiness for the employment market (Magalhães et al., 2015). Key measures include extending compulsory education to 12 years or the age of 18 (2009), and expanding vocational and artistic education programmes at upper secondary and tertiary levels (Magalhães et al., 2015; Nada et al., 2018; Araújo et al., 2020).

In Portugal, compulsory education spans ages 6 to 18. The first nine years, known as Basic Education (ISCED 1 and 2), follow a standardized structure. Specialization begins in Upper Secondary Education (ISCED 3, ages 15 to 18), when students select from scientific-humanistic[1] education, vocational education and training (VET), or specialised artistic programmes (EURYDICE, 2024), each being a fixed three-years cycle (grades 10 to 12) aimed at providing students with specialized learning and training according to their interests. Four scientific-humanistic pathways aim to prepare students for higher education, including sciences, humanities and economics. Specialised artistic pathways focus on creative fields, while the VET system offers over 150 technical programmes combining school and workplace learning. In 2022/2023, 63% of upper secondary students followed scientific-humanistic pathways, with Sciences and Technologies (32%) and Languages and Humanities (17%) being the most popular. VET programmes attracted 35% of students, with nearly 10% pursuing service-oriented pathways (DGEEC, 2024), such as hospitality, catering, tourism and leisure. VET students often come

1. In our paper, the "scientific-humanistic" study programme is roughly equivalent to what is commonly referred to as a general or academic study programme in most of the literature. However, we chose to retain the direct translation from the original Portuguese designation because we believe that labelling pathways as "general" or "academic" in opposition to "vocational" tends to disqualify the latter, a perspective we aim to avoid.

from disadvantaged socioeconomic backgrounds (Traqueia et al., 2020), reflecting a persistent trend also observed internationally (Câmara Leme et al., 2020). Scientific-humanistic programmes, particularly Sciences and Technologies, are associated with higher social status, while VET pathways carry lower status and negative social representations (Doroftei & Silva, 2024). On scientific-humanistic programmes, students take core subjects such as Portuguese, Philosophy and Physical Education, plus a selected Foreign Language. They also select two biannual subjects related to their field, which are essential for access to higher education. Conversely, VET students follow a fixed curriculum comprising sociocultural (e.g., Portuguese or Foreign Languages), scientific (2-3 subjects), technical (3-4 subjects) and workplace training components. These subjects often misalign with national exams required for university admission, limiting their opportunities. To address this, recent policies aim to improve access to tertiary and higher education for VET graduates, with special access pathways for these students. Nonetheless, institutional implementation remains limited.

Upper secondary education in Portugal is offered by public, private and cooperative schools, with public schools comprising 75% of the total (EURYDICE, 2024). Around 20% of schools provide both basic and secondary education, and most focus on scientific-humanistic programmes, with limited VET options. A national VET school network, including local public-private consortiums, was established 30 years ago as an educational innovation to enhance qualifications and counterbalance the traditional academic focus of mainstream high schools (Azevedo, 2019). In 2022/2023, 11% of students changed schools for their upper secondary education, especially those enrolling in VET programmes (DGEEC, 2024). And while social and procedural transitions were smooth, many students faced academic challenges due to increased workload and academic demands, reflecting the traditional focus on higher education preparation (Torres & Mouraz, 2015). These struggles were most pronounced among scientific-humanistic students, due to the perceived rigid structure and teaching models of their programmes (Torres, 2017; Torres & Mouraz, 2019).

Learning assessment in Portugal combines formative and summative methods, with internal tests and national exams playing a central role. Scientific-humanistic students take four national exams in grades 11 and 12, which are essential for graduation and access to higher education, and are tied to a highly mediatized school ranking system that fuels school and programme competition, and conditions teaching to societal and family expectations (Neves et al., 2014; Torres et al., 2018).

Changes in teaching and learning assessment practices have slowly been introduced in schools, with recent curricular reforms promoting curriculum flexibility and school autonomy (OECD, 2018; Mouraz & Cosme, 2021), expanding citizenship education (Monteiro et al., 2017), deepening inclusive education (Carvalho et al., 2023), and strengthening formative assessments, aiming for a more equitable education system.

2. Methods

2.1. Background and purposes

This study is part of a larger project exploring students' transition to upper secondary education (Torres, 2017; Torres & Mouraz, 2019; Torres et al., 2023), focusing on their academic experiences. While identifying specific challenges faced by students (Torres & Mouraz, 2019), it is also essential to gather broader perspectives on their programmes. To this end, an instrument was developed and validated to capture Portuguese students' perceptions at the start of their upper secondary education regarding their educational programmes. It addressed the following questions:

> (RQ1) What is the best internal structure of the scale (validity and reliability)?
>
> (RQ2) Can the instrument detect differences between the perceptions of students pursuing scientific-humanistic programmes and students pursuing vocational programmes? And what about in students pursuing vocational programmes at different types of schools?

2.2. Instrument design and structure

The scale consists of 12 items that assess the structure of programmes, including subjects, timeline, content and teacher-student relationships, using a 5-point Likert scale of agreement degrees. The items were newly designed based on a literature review on the Portuguese context (Torres & Mouraz, 2015; DGEEC, 2018; Teixeira & Flores, 2010) and on student perspectives collected through focus groups in four schools, where various experiences of transitioning to upper secondary education were discussed (Torres & Mouraz, 2019). Perspectives on the structure of students' educational programmes – particularly those capturing similarities and differences between scientific-humanistic and VET programmes – were adapted into scale items, which

Table 1. Students' perceptions of upper secondary education programmes (SPUSEP): items used in data collection

Items
1. My programme has too many courses.
2. I wish I had more study time with the support of my teachers.
3. Some general courses should not be mandatory.
4. I wish I had more practical activities in my classes.
5. Some specific courses should not be mandatory.
6. I wish I could contact professionals in the fields I am studying.
7. If I could choose, I would change some courses.
8. I feel the need for more time to have other activities outside class or school.
9. I feel that the courses have too much content to learn.
10. I feel that some of my courses will not be useful to my future.
11. I wish I could build my own timetable and set of courses.
12. I miss having more free time.

Source: author's own work.

were then cross-analysed with descriptive statistics from the item responses (Torres, 2017).

The scale included questions about personal characteristics (sex, age, tutors), previous school attainment, retentions, changes of school, and how previous education influenced course choice. To enhance validity, most questions were single-choice, based on the Portuguese "Observatory of Upper Secondary Education Students Trajectories" (DGEEC, 2015).

2.3. Participants and sample

Participants were 10th-grade students, in the first year of upper secondary education, from four selected schools, thus constituting a convenience sample. Four schools from northern Portugal were selected for the study, representing different organizational cultures based on location and educational offerings. The survey was administered to students from: one public upper secondary school in an urban area (school A), one solely vocational upper secondary school in an urban area (school C), one upper secondary school in a semi-rural area (school B), and one solely vocational upper secondary school in a semi-rural area (school D). The general education schools (A and B) were public schools, while the vocational schools (C and D) included a public school and one run by a business association. Since teachers accompanied students to computer rooms to complete the questionnaires, participating 10th-grade groups were selected by the schools based on availability and class schedules.

Table 2 summarizes the overall composition of the sample of returned and validated completed questionnaires.

Table 2. Overall composition of the sample of 10th grade students (N=185)

Variable	Type	Frequency (n)	Percentage (%)
Type of school	General school	117	63.2%
	Vocational school	68	36.8%
School	School A (public)	48	25.9%
	School B (public)	67	36.2%
	School C (private)	53	28.6%
	School D (public)	17	9.2%
Type of programme	Scientific-humanistic	83	44.9%
	Vocational	102	55.1%
Sex	Female	108	58.4%
	Male	77	41.6%
Age range	Up to 16 years old	129	69.7%
	More than 16 years old	56	30.3%
Change of school in upper secondary	Yes	132	71.4%
	No	53	28.6%
Choice of programme	First choice	123	76.9%
	Not first choice	37	20%
	N/A	25	13.5%

Source: author's own work.

Most participants were girls (58.4%), reflecting the national share of girls attending upper secondary education in that school year (DGEEC, 2018), and the age range was mostly up to 16 years old (69.7%). A third of responding students (30.3%) were above this regular age, higher than the national average of 25% in that year (DGEEC, 2018). In our sample, we had more students on VET programmes (55.1%) than on scientific-humanistic programmes (44.9%), which differs significantly from the national share of attendance on these programmes in that year (59.2% on scientific-humanities and 31.9% on vocational programmes) (DGEEC, 2018). This was mostly related to the selection of the schools in which we decided to pilot the scale, in connection with the exploratory study previously conducted (Torres & Mouraz, 2019).

2.4. Data collection and analysis

We conducted exploratory focus group discussions in four schools (Torres & Mouraz, 2019). In the following school year, the researcher set up the survey using LimeSurvey, and it was administered in May 2017 by teachers in computer rooms. Students were instructed to complete the online questionnaire anonymously, with a response time of up to 30 minutes.

Data were analysed using IBM SPSS Statistics 29.0 to answer our research questions, including recommended tests of the instrument in terms of validity and reliability (Field, 2009; Pallant, 2011). No missing data was handled since full completion was obtained for the whole sample (N = 185) in the considered items.

To determine and evaluate the internal structure of the scale (RQ1), we began by conducting a reliability check for the overall scale using Cronbach's alpha to gather information about the scale's internal consistency (Pallant, 2011). We than checked the suitability of the items to factor analysis by testing the intercorrelations among the items with the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. An exploratory factor analysis (EFA) was performed, to test for specific components in the instrument and detect patterns of correlations between items or components. We used principal component analysis (PCA) for extraction, and a Varimax rotation method, and assessed item/component distribution through the Kaiser criterion (Kaiser, 1960) and the Scree test, considering the factors with eigenvalues equal or superior to one. We had data on an ordinal scale limited to 5-point and with a significantly non-normal distribution (Kolmogorov-Smirnov tests with $.178 < D\ (185) < .279$ and $p < .001$ for all 12 items). Despite this non-normality condition, PCA was deemed appropriate as it is a data reduction technique that does not require the assumption of normal distribution (Bispo & Marques, 2023). And although we have a sample size that requires caution in attempts to generalize (Pallant, 2011), smaller sample sizes are relatively common in studies like this in which the bank of items is generated by previous qualitative studies and applied in specific con-

texts (White, 2022). To improve content validity, the statistically supported factors were than confronted with existing retrieved and analysed literature (Torres, 2017). The absence of a random sampling prevented us from performing a confirmatory factor analysis.

To compare groups following different programmes (scientific-humanistic/academic versus VET) and attending different types of schools (general versus VET only) (RQ2), an independent sample T-test was performed including Cohen's *d* as the effect size index. Levene's test for testing the equality of variance was computed to determine when to use an equal or unequal means estimates of *t*. When the *F* was significant with $p < 0.05$ the unequal estimate of t was selected.

2.5. Ethical considerations

Authorization was obtained from the Ministry of Education (through MIME) to conduct the study in public schools. At initial meetings with the school boards, we were able to discuss the study's aims, procedures and participant details. The schools themselves selected which students would participate in the surveys, provided they were enrolled in 10th-grade classes. The survey began with a consent notice, which emphasized the voluntary and anonymous nature of participation and the confidentiality of responses, which were used solely for research and dissemination purposes. Voluntary participation was ensured by allowing students to skip any questions they preferred not to answer. Finally, a summary of the main findings was returned to schools in April 2018 and discussed at meetings with the schools' boards afterwards, with the purpose of supporting quality improvement plans.

3. Results

3.1. Internal structure of the scale: validity and reliability

The Cronbach's Alpha suggests that the instrument presents good internal consistency (α=0.834; Field, 2009; Pallant, 2011). We excluded item 2, since the Cronbach's Alpha if this item was deleted (α=0.160) was considerably lower with influence on the overall Cronbach's Alpha (α=0.847). In fact, the content of such item had to do more with the relational dimension of the students with the teachers than with students' perceptions of their programmes' structure and main dynamics. Since we had a small instrument with 11 items, we investigated the Corrected Item-Total Correlation to verify that they were all above .4, suggesting all items contribute to the overall reliability of the scale (Field, 2009).

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's Sphericity tests were statistically significant (KMO=0.844; $\chi 2(55)$=640,588, $p<.001$), meeting the statistical requirements to proceed to factor analysis (Pallant, 2011).

The exploratory factor analysis resulted in the proposal of three components (Table 3), explaining 60.895% of the total variance. These corresponded to the three components with initial eigenvalues above 1.0, according to Kaiser's criterion to extract factors used by SPPS (Field, 2009) and able to produce a consistent internal structure of the scale. Furthermore, all components have loadings above .6, which makes them reliable solutions considering the sample size (Guadagnoli & Velicer, 1988; MacCallum et al., 1999). The factors explained 60.895% of the total variance, as indicated in Table 3. The final factor/component structure can be found in Table 4, which also shows rotated factor values ranged between .330 and .821. The rotation was unconstrained and items with factor loadings lower than .30 are not reported. In the components where one item loaded in more than one factor, the higher value was considered, except for item 8 as explained below.

Table 3. Results from the Principal Component Analysis (*N*=185) and reliability check for the SPUSEP instrument

Component	Eigenvalue	% of variance	% of variance after rotation	Cumulative%	Cronbach's alpha	Mean inter-item correlation
1	4.380	39.818%	23.563%	39.818%	.738	.412
2	1.294	11.763%	20.013%	51.581%	.746	.425
3	1.025	9.314%	17.319%	60.895%	.678	.413
TOTAL		55.962			.847	

Source: author's own work.

Table 4. Components loadings and communalities from the exploratory factor analysis (EFA). Extraction method: Principal Component Analysis (PCA) with Varimax rotation and Kaiser normalization. Factor loadings below .30 were suppressed for clarity, and the solution converged in six iterations

Items	Components			Communalities
	1 Course Load	2 Choice	3 Experiences	
1. My programme has too many courses.		,721		.573
3. Some general courses should not be mandatory.	,426	,644		.596
4. I wish I had more practical activities in my classes.			,769	.645
5. Some specific courses should not be mandatory.		,728	,341	.653
6. I wish I could contact professionals in the fields I am studying.			,821	.720
7. If I could choose, I would change some courses.	,769			.669

(Continued on the next page)

Items	Components			Communalities
	1 Course Load	2 Choice	3 Experiences	
8. I feel the need of more time to have other activities outside class or school.	,644		,499	.663
9. I feel that the courses have too many contents to be learned.	,577		,440	.569
10. I feel that some of my courses will not be useful to my future.	,649	,330		.537
11. I wish I could build my own time-table and set of courses.	,405	,653		.590
12. I miss having more free time.	,652			.583

Source: author's own work.

Table 5. Descriptive statistics (*N*=185)

Component	Name	Items	Total number of items	M (SD)
1	Course Load	7, 9, 10, 12	4	3.79 (1.026)
2	Choice	1, 3, 5, 11	4	3,22 (1.145)
3	Experiences	4, 6, 8	3	3.234 (1.065)
TOTAL			11	3.435 (.968)

Source: author's own work.

Component 1, named *Course Load*, includes items 7, 9, 10 and 12, reflecting the students' perceptions regarding the number of subjects and contents to study, and the significance they recognize in them, namely through the possibility of changing the contents within the subjects. These items reflect some of the academic difficulties students report when entering upper secondary education school, namely in terms of increased workload, pressure to succeed in internal and external assessments, and balance between school and personal activities (Torres & Mouraz, 2015, 2019; Torres, 2017). This component has an adequate internal consistency (α=.738) for a small scale (Vaske et al., 2016) with a mean inter-item correlation of .412, within the range recommended for instruments with a low number of items (Pallant, 2011). It explains the bigger proportion of the scale's variance (39.818% total variance explained before rotation; 23.563% total variance explained after rotation).

Component 2 includes items 1, 3, 5 and 11 and was named *Choice*, referring to items that aim to capture the students' perceptions of having some degree of choice in choosing their programme courses and schedules. It intends to support describing the relationship of students with the degree of personalization in their programmes, which differs largely across upper secondary education in Portugal (EURYDICE, 2024) but also across different educational systems (Stronati, 2023, 2024). With a total of four items, this component also has an acceptable internal consistency (α=.746) and a mean inter-item correlation with a considerable number of correlations (*r* inter-item = .425). It

explains a much smaller proportion of the total variance explained (11.763%), raising considerably after rotation (20.013%).

Finally, Component 3, with only 3 items (4, 6 and 8) was named *Experiences* and includes items that aim to reflect the expectations of young people that their school experiences have stronger connections with real-world experiences through further and meaningful contacts with the employment market and social contexts outside the school (Teixeira & Flores, 2010; Torres & Mouraz, 2019). This theoretical basis, along with an effect in the increase of the factor internal consistency and a factor load above .4 supported our option for including item 8 in this component, despite having load higher in factor 1. However, this component has a lower but still within an adequate range of internal consistency (α=.678), which is common in scales with fewer items (Pallant, 2011; Vaske et al., 2016) and a mean inter-item correlation of .413. It explains the lower proportion of the scale's variance (9.314% total variance explained before rotation; 17.319% total variance explained after rotation).

3.2. Perceptions from students attending different types of programmes and schools

We also wanted to verify if the instrument detects differences between perceptions of students attending scientific-humanistic programmes (n=83) and those of students attending VET programmes (n=102). In the specific case of students attending VET programmes, we further explored possible differences between students attending VET at general schools (n=34) and students attending VET dedicated schools (n=68). Group comparisons were performed with independent sample T-tests that included Cohen's d as the effect size index and Levene's test of the equality of variance to select the estimates of t.

For the comparison of programme type groups, unequal variances were assumed only for the component *Course Load* with Levene's test F=4.235, p=.041. For components *Choice* and *Experiences*, equal variances were assumed. The statistical analysis showed that the 83 participants who studied scientific-humanistic programmes (M=3.94, SD=.696) compared to the 102 respondent students in VET programmes (M=3.67, SD=.801) struggled significantly more with their *Course Load*, t(182)=2.4, p=.017. Furthermore, students in scientific-humanistic programmes (M=3.41, SD=.797) compared to students in VET programmes (M=3.09, SD=.835) also significantly reported higher expectations of their programmes having stronger connections with the employment market and out-of-school *Experiences*, t(183)=2.7, p=.008).

Concerning the subsample of students attending VET programmes, unequal variances were assumed only for the component *Course Load,* with Levene's test F=4.943, p=.028. However, statistical analysis showed no significant differences between the students attending different types of schools, with mean scores ranging from M=3.07, SD=.832 for the answers of students attending VET schools in the component *Experiences*, up to M=3.79, SD=.639 for the answers of students attending general schools in the component *Course Load*.

4. Discussion and conclusions

This study was inspired by the tension in balancing coherence and specialization in curricular policies for upper secondary education reform alongside the need to prioritize students' perspectives in the discussion. In Portugal, students transitioning to upper secondary education face a highly specialized system with limited flexibility, underscoring the need to capture their perceptions on programme structure. We therefore designed and validated the SPUSEP instrument to broadly capture students' perceptions of their upper secondary education programmes and provide valuable insights to curricular reforms at institutional, local and national levels.

While seeking for a valid and reliable internal structure (RQ1) we obtained an instrument with a good internal consistency and three meaningful factors – course load, choice and experiences – which also align with prior research on transitions to upper secondary education highlighting academic overload, limited personalization and weak connections between school and the outside world as key concerns (Torres & Mouraz, 2019; Doroftei & Silva, 2024; Teixeira & Flores, 2010). We also aimed to assess the instrument's ability to detect differences in perceptions among students in different types of programmes and schools (RQ2). While differences in responses (RQ2) between students in scientific-humanistic and VET programmes aligned with existing literature (Torres, 2017; Azevedo, 2019; Santos, 2023), namely in dimensions of course load and learning experiences, the lack of significant differences between schools allows us to secure a higher focus on curriculum structure rather than on organizational factors. This tool offers value beyond the Portuguese context, encouraging student-informed curriculum reforms and supporting international efforts to design more responsive and democratic upper secondary pathways (Lundy & Cook-Sather, 2016; Pereira et al., 2014).

We acknowledge several limitations of this study. First, the scale's brevity. While likely improving response rates and encouraging thoughtful answers, the reduced number of items may not capture all dimensions of students' experiences. It can, however, serve as a useful tool for initiating student discussions in schools committed to participatory curriculum reform. Second, our data were collected in 2017. Educational policies and student expectations have evolved since then, which may limit the direct applicability of our findings today. However, the SPUSEP instrument can be used in monitoring an ongoing pilot project in selected public schools, where students either in scientific-humanistic or in VET pathways, are being given the opportunity to combine subjects from different fields alongside a fixed general component, thus not being restricted to a rigid programme. Third, our mixed-methods design provided rich, holistic insights but relied on a small, non-random sample from a limited number of schools, constraining generalizability.

Future research should collect fresh data from larger, more diverse samples, including multiple programmes, school types and regions, to bolster evidence of the instrument's validity, reliability and precision. Confirmatory factor

analyses and longitudinal studies will also be needed to verify the stability of the factor structure and further refine the scale's measurement properties. Regional and territorial differences, as well as variations in school organization, particularly in terms of private vs. public, urban vs. rural, and small vs. large schools, can also be explored further. These refinements in the SPUSEP instrument can support student-informed and participatory reforms of upper-secondary programmes worldwide that address the balance between specialization and choice and improve students' experiences making the transition to this challenging educational stage.

Bibliographical references

Akos, P. & Galassi, J. P. (2004). Middle and high school transitions as viewed by students, parents and teachers. *Professional School Counseling*, *7*, 212-221.

Araújo, H., Macedo, E., Magalhães, A. & Rocha, C. (2020). Una mirada al abandono escolar prematuro en Portugal: Realidades, contextos y prácticas. *Educatio Siglo XXI*, *38*(2 Jul-Oct), 109-130. <https://doi.org/10.6018/educatio.414651>

Azevedo, J. (2019) *Políticas públicas: uma arte de promover o bem comum – O caso das escolas profissionais e do ensino profissional*. [Public policies: an art in promoting common good – the case of vocational schools and vocational education] In CNE (Ed.), *Estado da Educação 2018* (pp. 316-325). Conselho Nacional de Educação.

Bispo, R. & Marques, F. (2023). Stability of principal components under normal and non-normal parent populations and different covariance structures scenarios. *Journal of Statistical Computation and Simulation*, *93*(7), 1060-1076. <https://doi.org/10.1080/00949655.2022.2125971>

Câmara Leme, A., Escardíbul, J.-O., Nunes, L. C., Reis, A. B. & Seabra, C. (2020). The effect of a specialized versus a general upper-secondary school curriculum on students' performance and inequality. A difference-in-differences cross-country analysis. *Applied Economics*, *52*(39), 4317-4331. <https://doi.org/10.1080/00036846.2020.1734183>

Carvalho, A. E., Cosme, A. & Veiga, A. (2023). Inclusive Education Systems: The Struggle for Equity and the Promotion of Autonomy in Portugal. *Education Sciences*, *13*(9), 875. <https://doi.org/10.3390/educsci13090875>

De Wit, D. J., Karioja, K. & Rye, B. J. (2010). Student perceptions of diminished teacher and classmate support following the transition to high school: Are they related to declining attendance? *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice*, *21*, 451-472. <https://doi.org/10.1080/09243453.2010.532010>

DGEEC - Direção-Geral de Estatísticas da Educação e Ciência (2015). *Estudantes à entrada do Secundário em 2013/2014 – caracterização e percurso escolar. Sumário executivo*. Observatório dos Trajetos dos Estudantes do Ensino Superior.

— (2018). *Perfil do Aluno 2016/2017*. Ministério da Educação e da Ciência.

— (2024). *Estudantes à Entrada do Ensino Secundário: Escolha do curso, mudança de curso, mudança de escola e expetativas escolares e profissionais, 2022/23*. Ministério da Educação e da Ciência.

Doroftei, A. & Silva, S. M. (2024). Representations that society builds about vocational education: Perspectives of stakeholders involved in Portuguese Apprenticeship Courses. *Revista de Investigación Educativa*, *42*(1), 15-32. <https://doi.org/10.6018/rie.547481>

Dou, D. & Shek, D. T. L. (2022). Hong Kong high school students' perceptions of the new secondary school curriculum. *Frontiers Pediatrics*, *10*, 881515. <https://doi.org/10.3389/fped.2022.881515>

EU – EURYDICE (2024). *National Education Systems: Portugal overview*. Last update: 28 March 2024. <https://eurydice.eacea.ec.europa.eu/national-education-systems/portugal/overview>

Field, A. (2009). *Discovering statistics using SPSS*. 3rd edition. SAGE Publications.

Guadagnoli, E. & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, *103*(2), 265-275.

Hanushek, E., Schwerdt, G., Woessmann, L. & Zhang, L. (2017). General education, vocational education, and labor-market outcomes over the lifecycle. *Journal of human resources*, *52*(1), 48-87. <https://www.jstor.org/stable/26450020>

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, *20*, 141-151.

Kokotsaki, D. (2017). Pupil voice and attitudes to music during the transition to secondary school. *British Journal of Music Education*, *34*(1), 5-39. <https://doi.org/10.1017/S0265051716000279>

Lundy, L. & Cook-Sather, A. (2016). Children's Rights and Student Voice: their intersection and the implications for Curriculum and Pedagogy. In D. Wyse, L. Hayward & J. Pandya (Eds.), *The SAGE Handbook of Curriculum, Pedagogy and Assessment* (Vol. 1, pp. 263-277). SAGE.

MacCallum, R.C., Widaman, K. F., Zhang, S. & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, *4*(1), 84-99.

Magalhães, A. M., Araújo, H. C., Macedo, E. & Rocha, C. (2015). Early school leaving in Portugal: policies and actors' interpretations. *Educação, Sociedade & Culturas*, *45*, 97-119. <https://doi.org/10.34626/esc.vi45.249>

Monteiro, R. et al. (2017). National Strategy for Citizenship Education (ENEC). República Portuguesa. <https://cidadania.dge.mec.pt/sites/default/files/pdfs/national-strategy-citizenship-education.pdf>

Mouraz, A. & Cosme, A. (2021). The Ongoing Curriculum Reform in Portugal: Highlighting Trends, Challenges and Possibilities. In M. Priestley, D. Alvunger, S. Philippou & T. Soini (Eds.), *Curriculum Making in Europe - Policy and Practice Within and Across Diverse Contexts* (pp. 77-98). Emerald Publishing Limited.

Nada, C. I., Santos, S. A., Macedo, E. & Araújo, H. C. (2018). Can mainstream and alternative education learn from each other? An analysis of measures against school dropout and early school leaving in Portugal. *Educational Review*, *72*(3), 365-385. <https://doi.org/10.1080/00131911.2018.1508127>

Neves, T., Pereira, M. J. & Nata, G. (2014). Head teachers' perceptions of secondary school rankings: Their nature, media coverage and impact on schools and the educational arena. *Education as Change*, *18*(2), 211-225. <https://doi.org/10.1080/16823206.2014.926829>

OECD (2018). *Curriculum Flexibility and Autonomy in Portugal: an OECD Review*. OECD Reviews of Evaluation and Assessment in Education, OECD Publishing, Paris.
<https://doi.org/10.1787/77025e34-en>

Pallant, J. (2011). *SPSS Survival Manual. A step by step guide to data analysis using SPSS*. 4th edition. Allen & Unwin.

Pereira, F., Mouraz, A. & Figueiredo, C. (2014). Student Participation in School Life: The "Student Voice" and Mitigated Democracy. *Croatian Journal of Education*, *16*(4), 935-975.
<https://doi.org/10.15516/cje.v16i4.742>

Santos, A. P. E. (2023). *Managing student transitions into upper secondary pathways*. OECD Education Working Papers, 289. OECD Publishing, Paris.
<https://doi.org/10.1787/663d6f7b-en>

Stronati, C. (2023). *The design of upper secondary education across OECD countries: Managing choice, coherence and specialisation*. OECD Education Working Papers, 288. OECD Publishing, Paris.
<https://doi.org/10.1787/158101f0-en>

— (2024). *Managing choice, coherence, and specialisation in upper secondary education*. OECD Education Spotlights, 10. OECD Publishing, Paris.
<https://doi.org/10.1787/4a278519-en>

Teixeira, C. & Flores, M. A. (2010). Experiências escolares de alunos do Ensino Secundário: resultados de um estudo em curso. *Educação & Sociedade*, *31*(110), 113-133.
<https://doi.org/10.1590/S0101-73302010000100007>

Torres, A. C. (2017). Vozes de alunos sobre a estrutura e trabalho curricular à entrada do ensino secundário - ecos da dicotomia entre cursos científico-humanísticos e cursos profissionais. *Revista Portuguesa de Investigação Educacional*, *17*, 146-176.
<https://doi.org/10.34632/investigacaoeducacional.2017.3437>

Torres, A. C. & Mouraz, A. (2015). Students' transition experience in the 10th year of schooling: Perceptions that contribute to improving the quality of schools. *Improving Schools*, *18*(2), 127-141.
<https://doi.org/10.1177/1365480215581460>

— (2019). Transição para o Ensino Secundário em Portugal: vozes de estudantes sobre dificuldades académicas. *Educação & Sociedade*, *40*.
<https://doi.org/10.1590/es0101-73302019186268>

Torres, L. L., Palhares, J. A. & Afonso, A. J. (2018). Marketing accountability and excellence in the Portuguese state school: The construction of school social image through academic performance. *Education Policy Analysis Archives*, *26*(134).
<https://doi.org/10.14507/epaa.26.3716>

Torres, A. C., Peace-Hughes, T. & Priestley, M. (2023). Student Transition to Scotland Senior Phase of Schooling - Academic Experiences and Course Choices, *Curriculum and Teaching*, *38*(1), 7-26.
<http://dx.doi.org/10.7459/ct/38.1.02>

Traqueia, A., Nogueira, S., Barbosa, B., Costa, F., Dias, G. P., Filipe, S., Melo, A. I., Rodrigues, C., Santos, C. A. (2020). Vocational Education and Training VS. General Education: the influence of the socioeconomic context on students' choices. *INTED2020 Proceedings*, 8450-8455.
<https://doi.org/10.21125/inted.2020.2301>

Vaske, J. J., Beaman, J. & Sponarski, C. C. (2016). Rethinking Internal Consistency in Cronbach's Alpha. *Leisure Sciences*, *39*(2), 163-173. <https://doi.org/10.1080/01490400.2015.1127189>

White, M. (2022). Sample size in quantitative instrument validation studies: A systematic review of articles published in Scopus, 2021. *Heliyon*, *8*(12), e12223. <https://doi.org/10.1016/j.heliyon.2022.e12223>