AALBORG UNIVERSITY
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DELIVERY in Erasmus+ project Solution by Inclusion

INTELLECTUAL OUTPUT 4: A summative evaluation report on students' well-being and inclusion (W.P.7.2)

Delivered by project partner: CaBE, Aalborg University

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Solution By Inclusion

DEPARTMENT OF CULTURE AND LEARNING

AALBORG UNIVERSITY

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1. A SUMMATIVE EVALUATION REPORT ON STUDENTS' WELL-BEING AND INCLUSION

This report constitutes project partner CaBE's (at Aalborg University) delivery on the summative evaluation report that is part of **intellectual output 4 (IO4)** in the Erasmus+ project "Solution by Inclusion: Development of Digital, Innovative, Prevention & Intervention Solutions to Strengthen Social Inclusion, Well-Being, and Combat Early School Leaving in Vocational and Educational Training (VET) and Second Chance Learning (SCL) Schools".

This report constitutes the fourth work package **(W.P.7.2)** of **IO4** connected to the third work package **(W.P.3.7**) of **IO3**, which concerns the first (the baseline) and the second (post-intervention) measures on students' well-being and social inclusion. This report analyses the newest survey data from 2022 and concludes on the progression from 2021 and 2022 on a school level, and it also concludes on the comparative analysis across the three partnering VET/SCL schools.

The three partnering schools are GEM16+, Tradium, and IAL FVG localised in Malta, Denmark, and Italy, respectively. As such, this is an international project, which provides a rare possibility of identifying both unique and common challenges of in VET/SCL schools in different parts of Europe.

The Solution by Inclusion project aims to reduce the dropout rate among students at the upper secondary level in VET/SCL schools by enhancing social inclusion and mental well-being among students (Krogstrup et al., 2021a). This report contributes to this overall aim by identifying key patterns on four dimensions of mental well-being and two dimensions of social inclusion.

The four dimensions of mental well-being and the two dimensions of social inclusion are the following:

1. Emotional Well-Being
2. Management of Everyday Life
3. Social Life
4. School Burnout
5. Social Inclusion into the Learning Community
6. Social Inclusion into the Social Community

The data for this report were gathered using the *Finalized questionnaire* (CaBE, 2021) developed by CaBE based on a systematic literature review and a co-creation process involving students from peer advisory boards at the three partnering schools (Krogstrup et al., 2021a).

The final questionnaire aimed to measure six dimensions of mental well-being and social inclusion. To achieve a comprehensive understanding of students' experiences in these areas, several questions were included for each dimension, which is considered ideal for studying complex constructs because it allows for a more nuanced understanding of the phenomenon being studied (de Vaus, 2014).

This report considers several background variables (see Section 2.2) to ensure that any identified patterns are not biased by confounding factors. Mental well-being and social inclusion are complex constructs that can be influenced by both internal factors within schools and external factors outside of schools. By considering these variables, we can better understand the impact of different factors on well-being and social inclusion among students.

This report offers a broad overview of inclusion and well-being patterns across the three participating schools and identifies possible underlying variables or mechanisms that could contribute to increased well-being and inclusion in VET/SCL schools. To contextualise the findings, the report also compares them with the main results from a systematic literature review conducted by Krogstrup and colleagues (2021b). By considering both the study's own findings and existing research, we can gain a more complete understanding of the factors that impact well-being and inclusion in vocational and secondary education settings.

1.1. READING GUIDE

This report is structured as follows:

First, the method is explained, and the data are described in terms of response rate, missing values, variable types, and other core characteristics. Since this report concerns complex socio-psychological constructs involving mental well-being and social inclusion – described and defined in the systematic literature review (Krogstrup et al., 2021b) – it is explained how validity and reliability (both conceptual and statistical) have been considered throughout the research process.

Second, the statistical results are presented and interpreted in an analysis comprising three main sections:

1. The six dimensions of well-being and social inclusion are graphically depicted on a radar chart to provide an overview of the main results, including the progression/development of each dimension from 2021 to 2022.
2. Possible confounding variables are addressed, specifically gender and age (individual factors), the physical study environment (school-related factor), the students' family situation/constellation (family factor), and the parents' educational level (demographic factor). This is done to increase the validity of the overall results by controlling for possible third variables.

3. The school-specific variables are ordered into tables and visualised on separate radar charts to investigate whether these have any context-specific influence on well-being and social inclusion in each of the partnering schools. Hence, the school-specific variables are analysed to identify possible patterns related to certain student categories within each school.

Throughout the analysis, the results are discussed (incl. encountered limitations and interpretational complexities/uncertainties). Some results in the analysis/discussion are interpreted in the light of existing research and theory, but this summative report primarily focuses on the empirical results. To ensure methodological transparency, all essential statistical measures are reported.

Finally, the results are summarised in the conclusion, which includes suggestions and highlights some of the practical implications.

2. METHOD

The survey data were collected using the online tool SurveyXact and then imported into the statistical software SPSS (v. 28) for analysis. All statistical analyses were conducted using SPSS, and the resulting data were exported for visualisation in Excel/Word (Microsoft 365). All data visualisations in this report are based on the exported data and were created using Excel/Word.

2.1. DATA

The survey data of this report were collected from the three partnering schools during autumn/fall and early winter of 2022 (one year after the first measurement round, i.e. the baseline measure). Below, some core information is presented regarding the responses and missing cases to assess the quality of the collected data.

Table 1. Survey responses: complete, partial, and missing data in 2022

	GEM16+	Tradium	IAL FVG
Complete cases [a]	73 (87%)	647 (92%)	68 (86%)
Partial cases [b]	2 (2%)	38 (5%)	6 (8%)
Completely missing [c]	9 (11%)	17 (2%)	5 (6%)
Total invitations (*n*)	**84 (100%)**	**702 (100%)**	**79 (100%)**
Ratio sample/school	**84/109 = 0.77**	**702/887 = 0.79**	**79/1680 = 0.05**

Note. [a] The percentage of cases where students completed the entire questionnaire. [b] The percentage of cases where students only partially answered the questionnaire. [c] The percentage of cases where students handed in an entirely blank questionnaire.

N = 806 (*n* for each school combined minus completely missing cases).

Table 1 shows that the percentage of complete cases in the survey was high across all partnering schools, ranging from 86% to 92%. This is a positive indication of the survey's overall generalisability. Since each construct consisted of multiple items or questions, missing data within constructs could have damaged the study's validity. However, the percentage of partial cases was relatively low, ranging from 2% to 8%, which is considered acceptable for construct-level missingness. Overall, the percentage of responses (complete plus partial) was good or very good, ranging from 89% to 97%. A missingness rate of 5-10% is generally considered low or even unproblematic (Hair et al., 2019).

The ratio of sample size to school size varied greatly across the three VET/SCL schools, ranging from 5% to 79%. As a result, the samples from Tradium and GEM16+ are considered the most representative. Moreover, the small samples from IAL FVG and GEM16+ limited the statistical power and options. However, it is important to keep in mind that the smaller sample sizes may still provide valuable insights and should not be discounted entirely (Agresti et al., 2018), which is why this report contains both descriptive and inferential (predictive) elements.

2.2. BACKGROUND VARIABLES

To validly study the complex nature of student well-being and social inclusion, it is crucial to identify and consider the variables or conditions that may contribute to or significantly impact student well-being and social inclusion.

In the preliminary systematic review, Krogstrup et al. (2021b) emphasised that socio-demographic factors to some extent affect the association between mental/emotional well-being, social inclusion, and school dropout. School-related factors and family factors are typically considered highly influential in research on well-being and school dropout. In addition, studies suggest that mental well-being and dropout risk varies by gender.

To account for these possible third variables (confounders), survey data were gathered on background variables connected to (1) individual factors, (2) sociodemographic factors, (3) school-related factors, and (4) family factors.

The specific variables in these four categories are described below, including whether or how they were employed in the quantitative analysis.

Figure 1. Categorisation of background variables

Source: Krogstrup et al. (2021b).

Individual factors: Data were gathered on students' gender, age, and ethnicity to account for individual factors. In relation to gender, the category 'Other' was omitted because only 17 students identified with being non-binary. Three outliers were omitted from the age variable to reduce bias.[1] Ethnicity was excluded because most students reported being native born while a few reported being foreign born (inside or outside of EU).[2] Thus, the samples were too small to validly apply this variable.

Sociodemographic factors: A relatively large number of missing values on parents' level of education' was registered because many students had answered 'I don't know'.[3] Hence, this specific category was omitted from the variable. As a result, the missing values slightly reduced the variable's validity. Still, this was used as a control variable as the parents' level of education is a possible confounder.

School-related factors: Although the number of students with an apprenticeship agreement was low at both GEM16+ and Tradium (10 in total) during autumn/fall 2022, the study still examined the mean differences in well-being and inclusion between students with and without such an agreement to explore potential patterns, despite the limitations of the sample size. In addition, the study also analysed the variable of the physical study environment (e.g. indoor climate, noise, comfortable furniture in the classroom and other learning environments) in relation to the six dimensions of well-being and inclusion.

[1] One student reported being 12 years old; two students reported being 58 years old. These registrations were deemed unrepresentative, which is why they were omitted from the analyses that included the age variable (see Section 3.2).
[2] Percentage of native-born students: Tradium = 97%; GEM16+ = 44%; IAL FVG = 87%.
[3] Tradium = 18%; GEM16+ = 14%; IAL FVG = 14%.

Family factors: Data were gathered on family constellations. Students had the option to report who they currently live with or have lived with most of their lives. The students could select one or more of the following options: 'Mother', 'Father', 'Parent', 'Sibling(s)', 'Other people' (e.g. grandparents, guardians, or relatives), and 'I live(d) in foster home or children's home'. However, due to low a number of responses, the analysis focused on three main groups selected from the combined set of responses from all partnering VET/SCL schools. The purpose was to determine whether family constellation had a significant impact on students' well-being and inclusion overall and/or in relation to individual dimensions.

2.3. SCHOOL-SPECIFIC VARIABLES

In this section, the school-specific variables are described, which are analysed in relation to the six dimensions of well-being and inclusion (see Section 3.3)

Table 2. School-specific variables/question

Variable/question	GEM16+	Tradium	IAL FVG
s_6a: Which year are you attending? (1st to 3rd year)	×	✓	×
s_6b: Which overall field of study are you submitted to?	×	✓	×
s_6c: How many subjects are you currently enrolled to?	✓	×	×
s_6d: Which subject are you currently enrolled to? [a]	✓	×	×
s_6e: Which year are you attending? (1st to 4th year)	×	×	✓
s_6f: Which overall field of study are you submitted to? (e.g. receptionist, hairdresser, electrician ...) [b]	×	×	✓
s_7: Do you have an apprenticeship agreement?	✓	×	✓
s_22: Which options are you enrolled to? [c]	✓	✓	×

Note. A cross means that the specific question was not part of the school's survey, whereas a tick means that the specific question was part of the school's survey.

[a] Multiple-choice item with five options: none, ECDL, physics, biology, other/type. [b] Respondents at IAL FVG could type the option manually. [c] All respondents could type the option manually.

Table 2 displays the school-specific variables of the questionnaire administered at the three VET/SCL schools. In this report, all the above variables are analysed descriptively in relation to well-being and inclusion. However, some categories were excluded from the analysis due to a very low number of survey responses.

2.4. RESCALING AND CODING ITEMS

Before creating the radar charts, all items measured with three or four categories were rescaled to fit a 5-point scale to ensure equal weighting.

To rescale the items, the following formula was used:[4]

$$y = (B - A) \times (x - a)/(b - a) + A$$

Rescaling items enabled the possibility of making valid cross-comparisons among the six dimensions of well-being and inclusion (related dimensions according to the systematic review; Krogstrup et al., 2021b). Moreover, rescaling items made it easier to interpret the absolute values of well-being and inclusion since an average score above 3 on each dimension could be considered positive (see Figure 3; scores exceeding the fourth hexagon). Thus, a score of 3 represents the midpoint on each dimension while a score above 3 indicates that respondents, on average, have answered the construct's questions positively/above neutral.[5]

However, the caveat of this method is that it increases the dispersion around the mean on the rescaled variables, which is likely to result in a decreased ability to detect statistically significant effects/differences (cf. Field, 2018). Still, it was possible to estimate differences between the VET/SCL schools in a comparative analysis by using bias-corrected multiple comparisons (see Appendix B for the significance levels). Further, it was evaluated whether any progression had occurred between 2021 and 2022 in terms of the students' well-being and social inclusion, and whether these differences were statistically significant (see Tables 3–5).

Besides rescaling items into 5-point scales, some items and factors were reversed, if needed, to ensure that all dimensions were measured unidirectionally (from low to high). Thus, high values on each dimension (e.g. on the radar charts) signify positive levels of well-being or social inclusion, whereas low values signify the opposite – which applies to all figures and tables in this report.

2.5. VALIDITY AND RELIABILITY

Before conducting the analysis, all reflective factors or indices were carefully examined using (exploratory) factor analysis (FA) and reliability analysis (see Appendix A for information on the fundamental validity and reliability statistics).[6]

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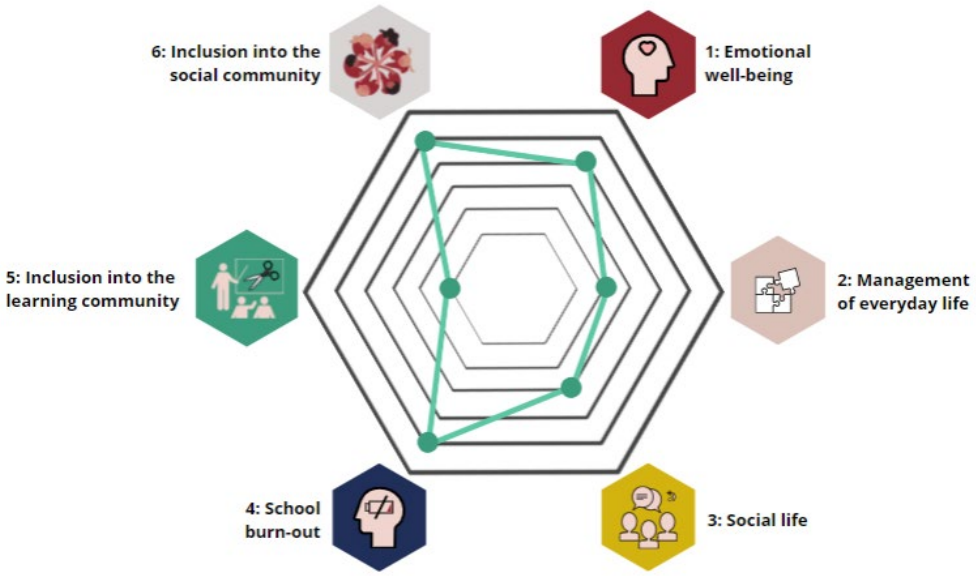
[4] A and B represent the new scale's bottom and top point while a and b represent the old scale's bottom and top point.

[5] For instance, if the original item were measured as [1 = low; 2 = neutral; 3 = high] then a rescaled version of this item would be [1 = low; 3 = neutral; 5 = high], which places 3 in the middle of this new 5-point scale as the neutral score.

[6] A reflective factor *reflects* an underlying phenomenon, which is often fully or partly psychological, whereas a formative factor (i.e. an index) is a theoretical formation consisting of non-reflective items not assumed to be correlated (Hair et al., 2019).

Although the items for each dimension were derived from previous empirical studies and theoretically co-evaluated/validated in cooperation with students, it was also necessary to statistically validate each dimension separately (cf. Hair et al., 2019). For this reason, all constructs of well-being and inclusion were assessed using Cronbach's alpha (α) and FA (spec. principal axis factoring) to determine if any amendments were required or deemed sensible before proceeding.[7]

Figure 2. Conceptual model of the six dimensions of well-being and inclusion



Source: Krogstrup et al., 2021a.

During the data-preparation process, some core characteristics of the data were identified, which are explained for each dimension in the following subsections:

Emotional Well-Being: By conducting FA a highly valid and reliable unidimensional factor was revealed/confirmed in the data. This factor was originally measured on a 5-point scale, which is why no adaptions were required.

Management of Everyday Life: This dimension was deemed sufficiently reliable. The FA revealed two underlying but strongly correlated subdimensions; the first concerned the ability to focus, concentrate, and manage responsibilities of daily life, whereas the second concerned the ability to adapt to unexpected situations

[7] Principal axis factoring is generally considered the optimal approach for reflective factors, which are often mental/psychological of nature (Field, 2018). This approach was used separately for the 2021 data and the 2022 data to establish validity across both measurement points separately (cf. Field, 2018).

and quickly find solutions. Thus, this factor was considered reflective but multidimensional as it contained two subdimensions: (1) Self Discipline and Mental Focus, and (2) Problem Solution Skills. Thus, students scoring high on this construct could be regarded as skilled in these areas.

Social Life: The FA revealed two separate but weakly correlated subdimensions. The reliability was acceptable in terms of Cronbach's alpha. The first subdimension concerned empathy and the desire to volunteer and help others, whereas the second concerned the ability to talk with family members. Furthermore, the FA suggested that Social Life should be interpreted as an index rather than as a reflective factor. In this manner, it measures the students' social life in points based on external conditions, and it should thus not be assumed to reflect an underlying (mental/psychological) dimension of well-being.[8]

School Burnout: Using FA, a single, unidimensional structure was uncovered, which pointed to the existence of a reflective factor. However, one item regarding the students' assessment of their educational and/or occupational future loaded in the reverse direction, which invalidated the construct.[9] Apparently, many students found it too hard to answer this hypothetical question about their occupational future. Hence, this item was removed, which greatly improved the factor's internal reliability and consistency (see Appendix A).

Social Inclusion into the Learning Community: FA was conducted, but initially the results on validity and reliability were unsatisfactory. Cronbach's alpha was below the standard threshold of 0.7 (Field, 2018), and the factor loading for item 18 on school liking was too weak ($\lambda = 0.46$; Hair et al., 2019).

It is debatable whether items 19a–19c (see CaBE, 2021) concern inclusion into the learning community or, more specifically, teacher support. In any case, item 18 was removed as it conceptually involved a different aspect of the learning community. This resulted in a much-improved measure with an acceptable Cronbach's alpha value and a proper unidimensional structure in the FA with acceptable or even strong factor loadings above 0.6 or close to 0.7 (see Appendix A).

Social Inclusion into the Social Community: The FA resulted in below average measures for validity and reliability. Specifically, variable 21 loaded weakly on the

[8] For instance, students who don't have a mother, father, or siblings will naturally score lower on this construct. Thus, this index provides a gauge of the students' social capital rather than their well-being as a psychological or mental construct.
[9] Item 17: "I feel that my educational and/or occupational future looks bright."

factor (λ = 0.46), indicating a low correlation with the construct's other items.[10] This implies that if a student spends time with other students during recess/break, it does not (causally) guarantee *experienced* inclusion. This is theoretically meaningful since researchers distinguish between psychological inclusion and active participation as two distinct dimensions of inclusion (Qvortrup & Qvortrup, 2018). Hence, variable 21 was removed. Subsequently, item 18 on 'school liking' was added to this construct instead, which increased Cronbach's alpha from 0.65 to 0.7, reaching the standard threshold of 0.7 (de Vaus, 2014; Field, 2018).

It can be argued on the basis of theory that school liking is connected to inclusion into the social community as it involves a social outcome rather than an academic. For instance, school liking is also part the factor Social Well-Being in the Danish Student Well-Being Questionnaire (MCE, 2021). It is also common to distinguish between social and academic dimensions/aspects of inclusion in education research (Messiou, 2012; Qvortrup & Qvortrup, 2018).

Moreover, the same adjustment for this particular variable was made in the baseline report (Krogstrup et al., 2022). Since it's ideal in quasi-experimental research that the same method is applied in all measurement rounds to correctly assess pre- and post-intervention results (cf. Field, 2018), all factors/indices were measured in the same manner in the baseline and summative report to ensure valid comparisons.

3. ANALYSIS

The statistical analysis is divided into three main sections:

In Section 3.1., the six dimensions of well-being and inclusion are examined using a radar chart in a comparative analysis: It is examined whether observed differences are statistically significant and thus generalisable. Moreover, all standardised differences are assessed using Cohen's *d* (Cohen, 1988) to provide objective (commonly agreed upon) interpretations of the observed differences. Finally, the progression in well-being and inclusion from 2021 and 2022 is evaluated to determine whether the project initiatives have proven effectful.[11]

[10] Item 21: "How often do you hang out with other students during recess/break?" (See the finalised questionnaire; CaBE, 2021).
[11] This section presents the summative evaluation regarding the progression in students' social inclusion and mental well-being on a VET/SCL level (W.P.7.2.). This progression can be evaluated from Tables 3–5.

In Section 3.2., the background factors are examined (incl. gender, age, parents' educational level, the physical study environment, and family constellations) in relation to the six dimensions of well-being and inclusion to determine whether these have any significant influence on the core outcomes and thus possibly on dropout.

In Section 3.3., school-specific variations of well-being and inclusion are examined in greater detail using radar charts (depicting several subgroups).

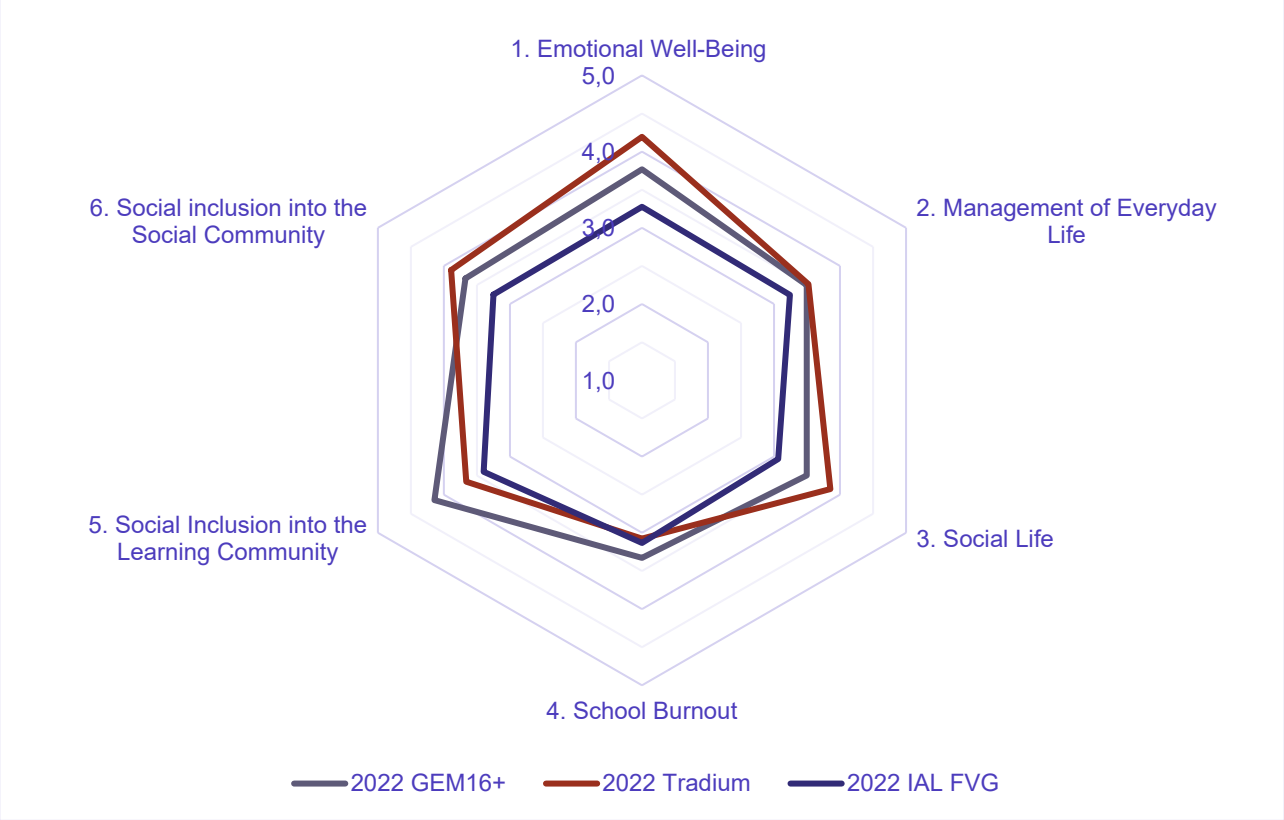
3.1. SIX DIMENSIONS OF WELL-BEING AND INCLUSION

The six dimensions of well-being and inclusion were identified in a systematic review. Specifically, four dimensions of mental well-being: (1) Emotional Well-Being, (2) Management of Everyday Life, (3) Social Life, and (4) School Burnout; and two dimensions of inclusion: (5) Social inclusion into the Learning Community, and (6) Social Inclusion into the Social Community (Krogstrup et al., 2021b).

Besides being validated as part of previous empirical research (see Krogstrup et al. 2021b), all six dimensions were assessed by involving students in a creative co-creation process with the aim of highlighting questions of particular importance for the students. This validation and co-creation process was completed before the final questionnaire was administered (Krogstrup et al., 2021a).

In the following analysis of the radar chart, the focus is placed on the 2022 data since the baseline report contains a detailed comparative analysis of the 2021 data.

Figure 3. Radar chart: six dimensions of well-being and inclusion in 2022



Note. The larger the area the radar chart covers, the more positive the result. School Burnout has been reversed so that a high score indicates a low degree of burnout.

N_{2022} = 865.

Figure 3 shows the mean score (*M*) on six dimensions of well-being and inclusion on 5-point scales (1–5) for each of the partnering schools. A mean score above 3 is mathematically positive in absolute terms when interpreting these raw results (see Section 2.4). Thus, if one school scores lower than another it is not necessarily negative in itself as this also depends on the absolute scores.

On Emotional Well-Being, Tradium (*M* = 4.19) had the highest score while GEM16+ (*M* = 3.77) and IAL FVG (*M* = 3.28) scored lower. Thus, all schools had positive scores in absolute terms, which suggests that the students in general experience a positive degree of happiness, life satisfaction, and meaning in life regarding its sense of direction. Moreover, the students are mostly happy with various aspects/parts of their personality and feel confident in thinking and expressing personal ideas and opinions. However, fewer students responded positively on this construct at GEM16+ and IAL FVG compared to Tradium, implying that more efforts are required to improve their emotional well-being. All school comparisons were statistically significant and can therefore be generalised (see Appendix B).

In relation to Management of Everyday Life, the scores were quite similar. Tradium (M = 3.52) had the highest score, whereas GEM16+ (M = 3.29) scored second highest and IAL FVG (M = 3.24) scored lowest, reaching a score slightly above 3. This indicates that most students have a decent ability to manage responsibilities of everyday life, focus/concentrate on tasks, finish their work, stay attentive, and keep a good balance between schoolwork and spare time. Although the observed school differences were quite small, they were statistically significant, except between IAL FVG and GEM16+ (p > 0.05), which was also found in the baseline report (Krogstrup et al., 2022). This implies that students at Tradium are better at handling or managing everyday life compared to students at both GEM16+ and IAL FVG.

Regarding Social Life, a similar pattern emerged. Tradium (M = 3.85) had the highest score, GEM16+ (M = 3.50) scored second highest, and IAL FVG (M = 3.06) scored lowest, barely reaching a positive score above the scale's midpoint (= 3) Again, all scores were positive, which implies that most students experience a positive social life in which they feel compassionate and empathetic (report that they care about others' feelings and that they often volunteer to help others: e.g. parents, friends, children, and teachers), find it easy to talk to close friends about things that bothers them, and find it easy to talk to family and relatives (e.g. their mother, father, siblings, or other family members). Nonetheless, there is apparently room for improvement as indicated by the school comparisons, particularly at IAL FVG, even though their absolute score was still positive. All differences between GEM16+, Tradium, and IAL FVG were statistically significant, indicating that students at Tradium rate their social life higher compared to students at the other VET/SCL schools, and that students at GEM16+ rate their social life higher than students at IAL FVG. Why this discrepancy occurs is not evident from the data, but the possible causes could be further explored (e.g. with qualitative methods to attain a deeper understanding of social processes; Bryman, 2021).

The factor School Burnout revealed an unexpected result that contrasted the consistent pattern of the previous factors. Tradium (M = 3.08) scored lowest – lower than in the baseline report – whereas IAL FVG (M = 3.46) and GEM16+ (M = 3.33) scored highest. This suggests that students at Tradium experience greater levels of burnout, implying that they more often feel overwhelmed by schoolwork, lack motivation, think about giving up, find their schoolwork uninteresting, and more often have debilitating feelings of lack or inadequacy. This result is surprising given that students from Tradium experienced the highest degree of emotional well-being, which was also found in the baseline report. Although the scores from all schools were above the dimension's midpoint (M > 3), they indicate that more should be done to reduce stress and burnout among students, especially at Tradium, which scored the lowest at both time points. The difference between Tradium and IAL FVG was significant, which suggests that students at Tradium are more likely to experience higher levels of school burnout than students at IAL FVG.

On Social Inclusion into the Learning Community, the pattern differed from the previous, which was also found in the baseline report. GEM16+ (M = 4.14) scored highest followed by Tradium (M = 3.66) and IAL FVG (M = 3.40). Although all scores were above 3, GEM16+ had an exceptionally high score above 4, which was also the case in the first measurement round (cf. Krogstrup et al., 2022). These results imply that most students experience a positive degree of teacher support (measured as an aspect of the learning community).[12] Still, students at GEM16+ experienced significantly (p < 0.001) more inclusion into the learning community compared to students at IAL FVG and Tradium. It is surprising that students at GEM16+ are much more likely to experience stronger inclusion into the learning community since this contrasts the results on the other dimensions.

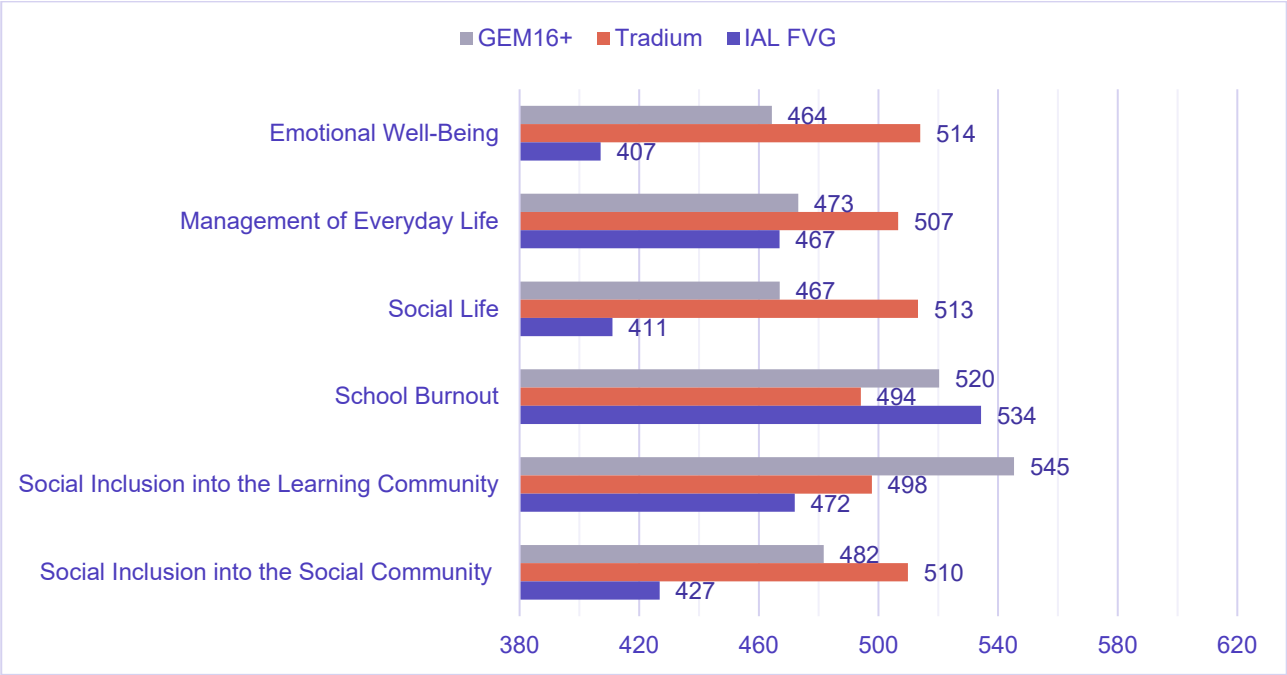
In relation to Social Inclusion into the Social Community, Tradium (M = 3.89) had the highest score while GEM16+ (M = 3.67) and IAL FVG (M = 3.22) scored lower. All scores were above 3 and thus above average in absolute terms. This implies that most students at the three VET/SCL schools experience a positive degree of inclusion into the social community, indicating that they find it easy to talk to friends in school about difficult matters, and that they mostly enjoy hanging out with other students during recess/break. In addition, included students mostly feel that they belong in school and that their peers accept them as they are (cf. the finalised questionnaire, W.P.3.6). Although the overall level of social inclusion was positive, the school differences are noteworthy, and the mean scores below 4 indicate that improvements are possible overall. A significant difference was confirmed between Tradium and IAL FVG as well as between GEM16+ and IAL FVG, which replicates the finding from the baseline report. This implies that students at GEM16+ and at Tradium experience higher degrees of inclusion into the social community compared to students at IAL FVG, which suggest that more could be done to strengthen social inclusion for students at IAL FVG.

STANDARDISED EFFECTS

In this subsection, the standardised effects are assessed to interpret the size of the observed differences on the six dimensions of well-being and inclusion.[13]

[12] The item on school liking was excluded from this factor for both statistical and conceptual reasons (see Section 2.5; cf. CaBE, 2021 the final questionnaire).
[13] The pooled standard deviation was used as there was no control group (cf. Field, 2018).

Figure 4. Standardised effects



Note. To calculate the standardised effect/difference on each factor/index, Cohen's *d* was used (Cohen, 1988). All means were compared to the grand mean at 500. School Burnout has been reversed so that a higher score indicates a lower degree of burnout.

Figure 4 displays the mean differences between the three schools.[14] In the following, these mean differences are interpreted as small, medium, or large (mainly the significant differences are highlighted; see Appendix B for the exact *p*-values).[15]

On Emotional Well-Being, Tradium scored 50 points higher than GEM16+ and 107 points higher than IAL FVG, indicating moderate to large differences on emotional well-being for students at Tradium compared to students at GEM16+ and IAL FVG. In addition, students at GEM16+ experienced lower emotional well-being to a small extent compared to the grand mean (36 points below the grand mean at 500 points). IAL FVG scorer lower than the grand mean to a large extent (93 points).

For Management in Everyday Life, Tradium scored slightly higher than GEM16+ (34 points) and moderately higher compared to GEM16+ (40 points). No significant difference was present between GEM16+ and IAL FVG (6 points).

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[14] Figure 4 measures the standardised differences/similarities in social inclusion at the partnering schools and can be used to identify "extreme cases" as promised in W.P.3.7.

[15] Hattie (2009) suggested that differences measured with Cohen's *d* in educational contexts should be interpreted as follows: ±0.2 = small; ±0.4 = medium; ±0.6 = large. This equates to 20, 40, and 60 points, respectively, as displayed on Figure 4. Differences below 20 points can thus be considered very small or practically unimportant.

In relation to Social Life, there was a large difference between Tradium and IAL FVG (102 points) – an even greater difference than measured in 2021. The difference between GEM16+ and Tradium was moderate (46 points).

School Burnout was highest at Tradium (theoretically unexpected as they scored highest on Emotional Well-Being). Compared to GEM16+ (14 points) and IAL FVG (40 points), the mean differences were very small to moderate.

Social Inclusion into the Learning Community was substantially stronger at GEM16+ compared to both Tradium (47 points) and IAL FVG (73 points), indicating moderate to large differences in the students' perception of inclusion on this dimension

Social Inclusion into the Social Community was highest at Tradium, but at a similar level at GEM16+. IAL FVG scored significantly lower than both GEM16+ (55 points) and Tradium (83 points), indicating moderate to large differences.

In summary, IAL FVG scored lowest, especially on emotional well-being, social life, and social inclusion into the social community (moderate to large differences). Among the three schools, Tradium scored highest on four dimensions and about average on social inclusion into the learning community and school burnout. Tradium's students reported higher levels of burnout (i.e. a lower score) to a small extent. GEM16+ was placed slightly below average on most dimensions; they scored slightly better on burnout and had an impressive score on social inclusion into the learning community, which was similarly the case in the first measurement round, which indicates that this aspect has remained relatively stable over time.

PROGRESSION IN WELL-BEING AND INCLUSION

In this part of the analysis, it is briefly examined whether any changes have occurred on the six dimensions of well-being and inclusion between 2021 and 2022, which are substantial enough to be considered statistically significant, which might imply that the initiatives and interventions implemented in each partnering school as part of the Solution by Inclusion programme have proven effectful or worthwhile as a whole.

It must be emphasised that this quantitative and summative evaluation report does not provide a full assessment of the programme, which is why its results should be seen in relation to findings from the other analyses (incl. the qualitative analysis of this project). Moreover, it must also be emphasised that the small samples from IAL FVG and GEM16+ make estimation of differences between measures less accurate (cf. Field, 2018).

Table 3. Well-being and social inclusion at GEM16+ in 2021 and 2022

	Year	*n*	Mean
Emotional Well-Being	2021	56	3.75
	2022	74	3.77 ↑
Management of Everyday Life	2021	56	3.16
	2022	74	3.29 ↑
Social Life	2021	56	3.68
	2022	74	3.50 ↓
School Burnout (reversed)	2021	56	3.49
	2022	73	3.33 ↓
Social Inclusion into the Learning Community	2021	54	4.35
	2022	72	4.14 ↓
Social Inclusion into the Social Community	2021	55	3.77
	2022	73	3.67 ↓

Note. Independent *t*-tests on each dimension showed that no differences were statistically significant, suggesting that the levels of well-being and inclusion were similar in 2021 and 2022.

Table 3 shows that no statistically significant differences were observed between the two measurement points at GEM16+. The mean score improved marginally on just two dimensions (Emotional Well-Being and Management of Everyday Life) while it reduced marginally on the four other dimensions. Hence, the data do not indicate any progression in well-being and inclusion at GEM16+.

Table 4. Well-being and social inclusion at Tradium in 2021 and 2022

	Year	*n*	Mean
Emotional Well-Being	2021	566	4.17
	2022	662	4.19 ↑
Management of Everyday Life	2021	561	3.56
	2022	658	3.52 ↓
Social Life	2021	560	3.86
	2022	655	3.85 ↓
School Burnout (reversed)	2021	551	3.09
	2022	651	3.08 ↓
Social Inclusion into the Learning Community	2021	536	3.60
	2022	637	3.66 ↑
Social Inclusion into the Social Community	2021	550	3.91
	2022	650	3.89 ↓

Note. Independent *t*-tests on each dimension showed that no differences were statistically significant, suggesting that the levels of well-being and inclusion were similar in 2021 and 2022.

In regard to Tradium, the sample size was much larger compared to the other schools, which is why statistical differences were anticipated. However, Table 4 shows that the mean scores on each dimension were similar between 2021 and 2022, almost identical on some dimensions, and the scores only changed marginally in an upward direction on two dimensions (Emotional Well-being and Social Inclusion into the Learning Community) while the remaining four dimensions decreased marginally. The largest difference between 2021 and 2022 was measured on the dimension of Social Inclusion into the Learning Community, which increased 6 points in total. The marginal difference between the two measurement points is the reason that no significant results emerged.

Table 5. Well-being and social inclusion at IAL FVG in 2021 and 2022

	Year	*n*	Mean
Emotional Well-Being	2021	107	3.33
	2022	71	3.28 ↓
Management of Everyday Life	2021	107	3.33
	2022	71	3.24 ↓
Social Life	2021	106	3.29
	2022	70	3.06 ↓
School Burnout (reversed)	2021	105	3.39
	2022	69	3.46 ↑
Social Inclusion into the Learning Community	2021	102	3.42
	2022	67	3.40 ↓
Social Inclusion into the Social Community	2021	104	3.42
	2022	69	3.25 ↓

Note. Independent *t*-tests on each dimension showed that no differences were statistically significant, suggesting that the levels of well-being and inclusion were similar in 2021 and 2022.

The negative change on the dimension for social life was nearly significant ($p = 0.08$).

Table 5 shows that there was no significant difference between the two measurement rounds at IAL FVG. The mean scores improved marginally on just one dimension (School Burnout), whereas the mean scores on the other five dimensions decreased. Although this seems to suggest that well-being and levels of social inclusion have become lower, the differences are small enough to be expected based on random fluctuation.

In summary, the changes on most dimensions for the three schools have been negative and insignificant, which is why there is little evidence to suggest that the implemented initiatives or interventions have proven effective or made a positive contribution to students' overall level of social inclusion and well-being. The statistical tests indicates that no significant change has occurred.

3.2. BACKGROUND FACTORS

In this second main section of the analysis, the influence of background factors is assessed in relation to students' sense of well-being and inclusion.

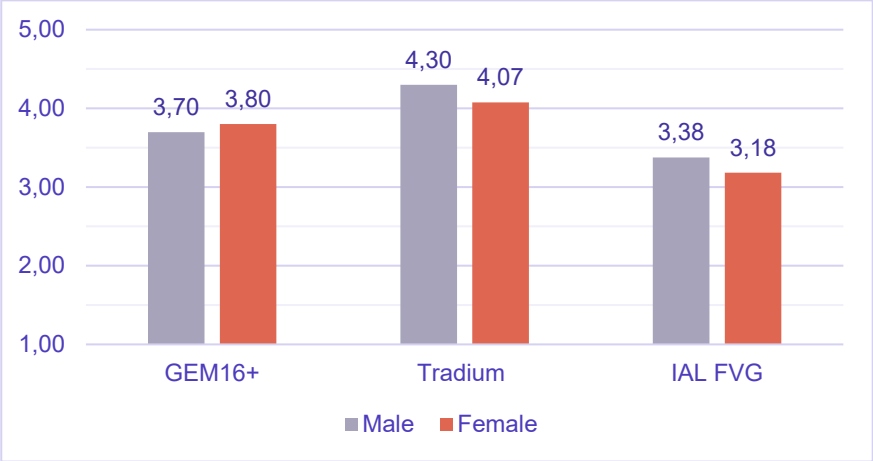
GENDER, AGE AND PARENTS' EDUCATIONAL LEVEL

To examine the influence of gender on the six dimensions of well-being and inclusion, a multivariate statistical model was formed.[16]

The following background variables were employed to test for possible confounders: gender, age, and the parents' educational level (ethnicity was excluded due to small group sizes). Specifically, the relationship between gender, school type, and the six dimensions of well-being and inclusion were examined while controlling for the influence of age and the parents' educational level.

The statistical model revealed that age, gender, and the parents' educational level did not significantly impact the six dimensions of inclusion and well-being. School type was the most crucial variable ($p < 0.001$).[17] The largest gender difference was observed on emotional well-being, which varied among the three schools.

Figure 5. Emotional Well-Being by gender



Note. MANCOVA was conducted with the age variable as a covariate.[18]

[16] A MANCOVA (multivariate analysis of covariance) was formed, which examines explanatory variables including a covariate in relation to several linearly combined outcomes assumed to be theoretically related (Field, 2018).
[17] This was assessed using Pillai's trace statistic, which is considered the most powerful in relation to a factorial MANCOVA (Field, 2018).
[18] Age was centered at $M = 17.37$. In addition, some outliers were removed by restricting the viable observations to ages 13–25.

Figure 5 depicts the mean score of emotional well-being for the three partnering VET/SCL schools. The scores indicate that females have lower emotional well-being than males at Tradium and at IAL FVG while the opposite tendency was observed at GEM16+ where females had higher emotional well-being than males. More specifically, the statistical test showed that this gender difference was significant at Tradium. At Tradium, females (M = 4.07) scored a bit lower than males (M = 4.30), but still above the grand mean for the three schools combined (M = 4.02).

Notably, the results were almost identical in the baseline report for the 2021 data (cf. Krogstrup et al., 2022), suggesting that females experience lower emotional well-being than males at Tradium. The findings are also comparable to existing research. For instance, research in lower secondary education in Danish public schools has established that girls (Grades 4–10; ages 10–16) typically experience more social marginalisation and lower social well-being than boys (Andersen, 2021; Jensen et al., 2020). The Danish Student Well-Being Questionnaire, the most comprehensive survey on well-being in Danish public schools, has also consistently shown that girls score lower on social well-being compared to boys (MCE, 2022). Similarly, Parviainen et al. (2020) found that females in VET were prone to higher levels of depression than males, suggesting that gender differences in relation to well-being are also present in VET schools. This is problematic because lower well-being is also associated with higher dropout intensions (Krogstrup et al., 2021b).

THE PHYSICAL STUDY ENVIRONMENT

In this part of the analysis, the importance of the physical study environment is assessed since school-related factors are considered important for students' well-being and social inclusion (Krogstrup et al., 2021b). For this purpose, a correlational analysis was conducted to assess the association between the physical environment and each dimension of well-being and inclusion.

Table 6. Correlation analysis: the physical study environment (PSE)

VET/SCL: item	**Dim. 1**	**Dim. 2**	**Dim. 3**	**Dim. 4**	**Dim. 5**	**Dim. 6**
GEM16+: PSE	0.199	0.149	0.112	0.286*	0.186	0.342**
Tradium: PSE	0.298***	0.308***	0.202***	0.239***	0.317***	0.284***
IAL FVG: PSE	0.442***	0.293**	0.186	0.345**	0.425***	0.366**

Note. Spearman's rho (r_s) was applied to examine the bivariate (ordinal) correlations.

Dimensions: 1 = Emotional Well-Being; 2 = Management of Everyday Life; 3 = Social Life; 4 = School Burnout; 5 = Social Inclusion into the Learning Community; 6 = Social inclusion into the Social Community. PSE = Physical Study Environment (ordinal variable: scale 1–4).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6 shows the correlations for the physical study environment and the six dimensions of well-being and inclusion.[19] All associations were significant (marked with one or more asterisks [*]): seven were moderate to strong (r_s > 0.30); eleven were weak (r_s < 0.30); and three were almost moderate. These results confirm the overall pattern from the previous report (Krogstrup et al., 2022), emphasising the criticalness of the physical study environment in supporting students' well-being and inclusion in the partnering schools.

All correlations for social inclusion into the social community (Dim. 6) were moderate or close to moderate. The same applied to the other dimensions (but to a lesser extent), which suggests that students who experience a better physical study environment tend to simultaneously experience higher well-being and stronger inclusion. However, the direction of these associations cannot be fully determined from cross-sectional data. It's equally possible that students with stronger well-being and sense of inclusion rate the physical study environment higher partly due to emotional positivity (e.g. mood bias) or relatively stable personality traits.[20]

Figure 6. The physical study environment by school

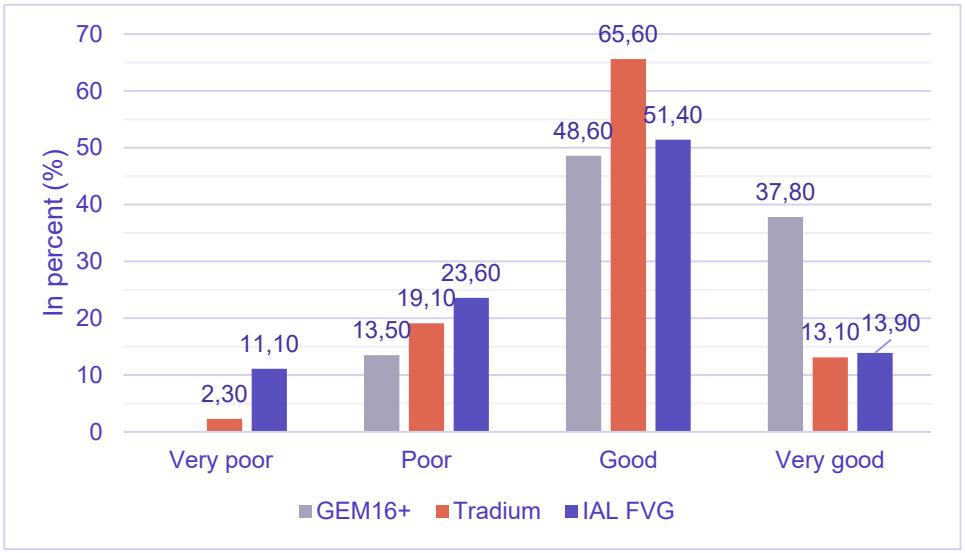


Figure 6 shows that students at GEM16+ tend to rate the physical study environment higher compared to students at Tradium and IAL FVG, which confirms the finding from the baseline report (Krogstrup et al., 2022).

[19] Bivariate correlations of r_s range between −1 and +1 and are interpreted as follows: ±0.1 = small; ±0.3 = medium; ±0.5 = large (Field, 2018).
[20] It's likely that common method variance, if present, accounts for at most 41 percent of the variance when working with attitude measures, or around 31 percent of the variance in the field of education (Cote & Buckley, 1987; Podsakoff et al., 2003).

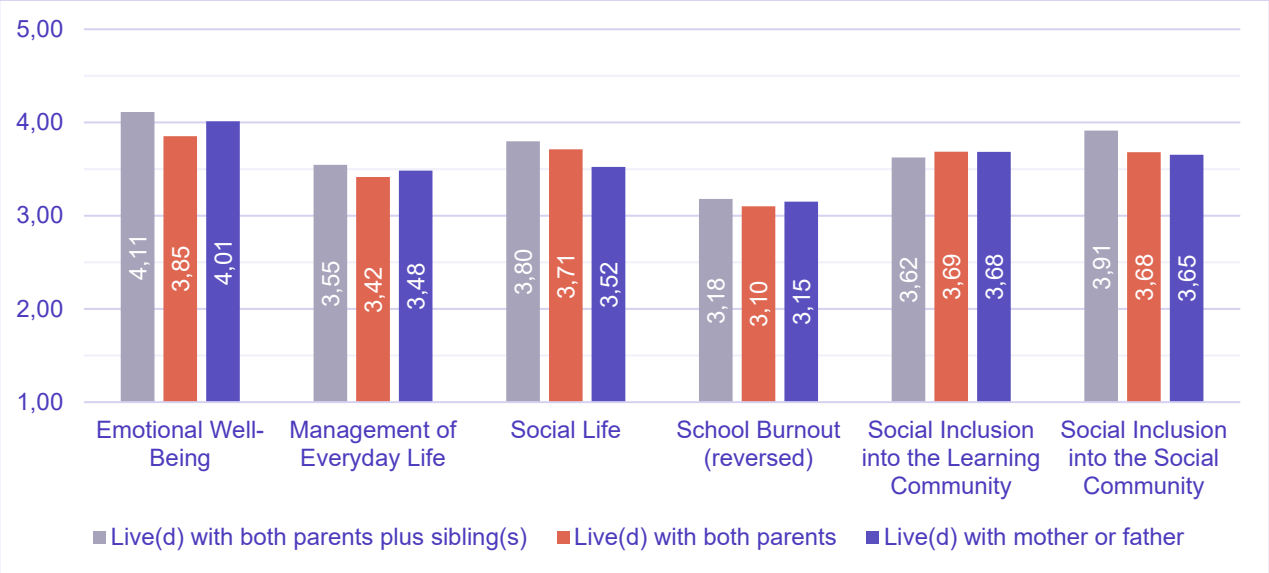
In summary, it's concluded that (1) the physical study environment is weakly to moderately correlated with all or most dimensions of inclusion and well-being at the partnering schools; (2) that students at GEM16+ rate the physical study environment slightly higher than students at IAL FVG; and (3) that male students rate the physical study environment higher than female students at Tradium (see Appendix C for the full analysis on the physical study environment).

FAMILY SITUATION

On the multiple-choice question "Please answer this question for the home where you have lived all or most of your life and tick the people you live(d) with", the most selected categories were 'Mother' (92.7%), 'Father' (83.3%), and 'Sibling(s)' (75.3%). The remaining categories, such as 'Foster/children's home' or 'Family relatives/guardians', were rarely chosen by respondents, which made these categories infeasible to analyse in relation to family situation (see Appendix D).[21]

The following analysis (a MANOVA[22]) investigates whether students who live with their mother, father, both of their parents, or both of their parents along plus sibling(s), have greater well-being compared to other groups.

Figure 7. Family constellation: six dimensions of inclusion and well-being



Note. No significant overall effect was found using MANOVA ($p > 0.05$).

[21] Only 8 respondents across the three VET/SCL schools reported that they had lived on a foster/children's home most of their lives.
[22] MANOVA: Multivariate analysis of variance is an inferential method that contains several outcomes combined into a linear composite variable (Field, 2018).

Sample size per group: Lived(d) with both parents plus sibling(s): *n* = 528. Live(d) with both parents: *n* = 591. Live(d) with mother or father: *n* = 113. Since most students either live with one or both parents plus siblings, other groups (*n* = 14) were excluded from the figure.

Figure 7 displays relatively similar results within most dimensions of inclusion and well-being. For the most part, students who live(d) with both parents plus sibling(s) experienced slightly higher emotional well-being, better management of everyday life, a stronger social life, slightly less burnout, and stronger inclusion into the social community, but no apparent differences were present for social inclusion into the learning community.

The statistical test did not reveal any significant differences (p = 0.276–0.904).[23] This suggests that family background does not have a significant impact on well-being and inclusion combined. Moreover, the between-group effects did not reveal any significant differences on individual dimensions (cf. Krogstrup et al., 2022).

To summarise, there is only weak evidence that certain family constellations affect inclusion and well-being in this study, which indicates that family situation is not a confounder of general concern in this study.

3.3. SCHOOL-SPECIFIC VARIABLES

In this third part of the analysis, the school-specific questions (apprenticeship agreement, year of attendance, and subject choice) are analysed in relation to the six dimensions of well-being and inclusion using the newest data from 2022.

APPRENTICESHIP AGREEMENT

Based on the literature review (Krogstrup et al., 2021a), it was expected that students with an apprenticeship agreement would experience higher well-being and sense of inclusion in general, which is why this was examined further.

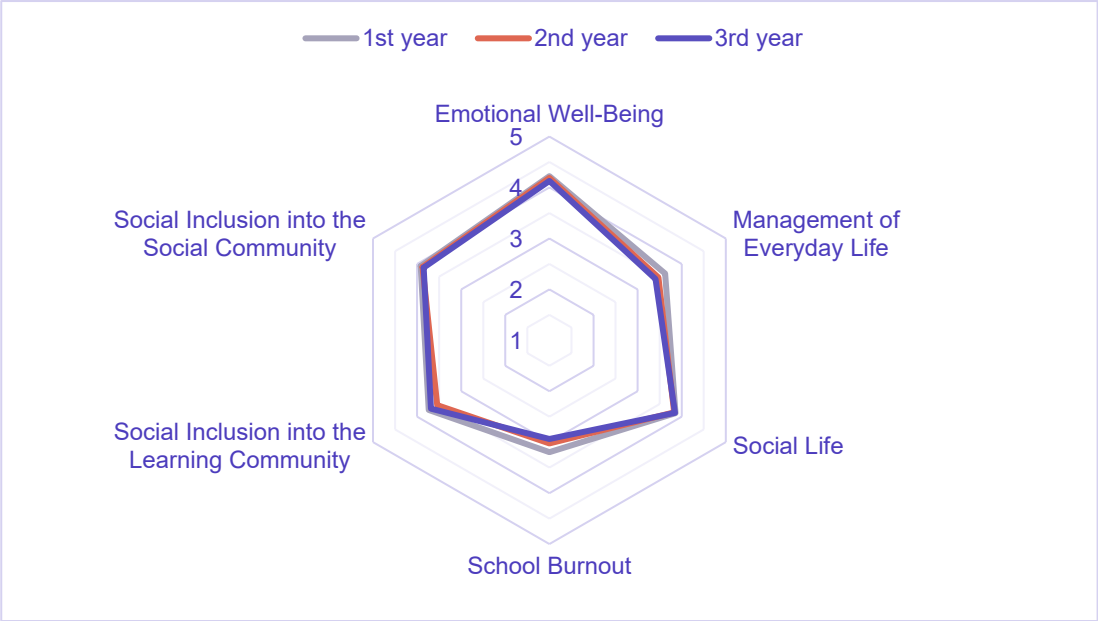
Although students' at GEM16+ and IAL FVG with an apprenticeship agreement experienced greater well-being and inclusion compared to those without, the results were not valid since only a few respondents had no apprenticeship agreement. [24] Hence, additional data is needed to draw more accurate conclusions.

[23] Pillai's trace statistic was used for the overall MANOVA, which is generally considered the most valid approach (Field, 2018).
[24] At GEM16+ only 3 students answered that they had an apprenticeship agreement, and the same applied to 7 at IAL FVG, which is why these results were ignored.

YEAR OF ATTENDANCE

In the following, radar charts are used to depict the levels of well-being and inclusion among students on different years of attendance at Tradium and IAL FVG.

Figure 8. Which year are you attending? (Tradium)

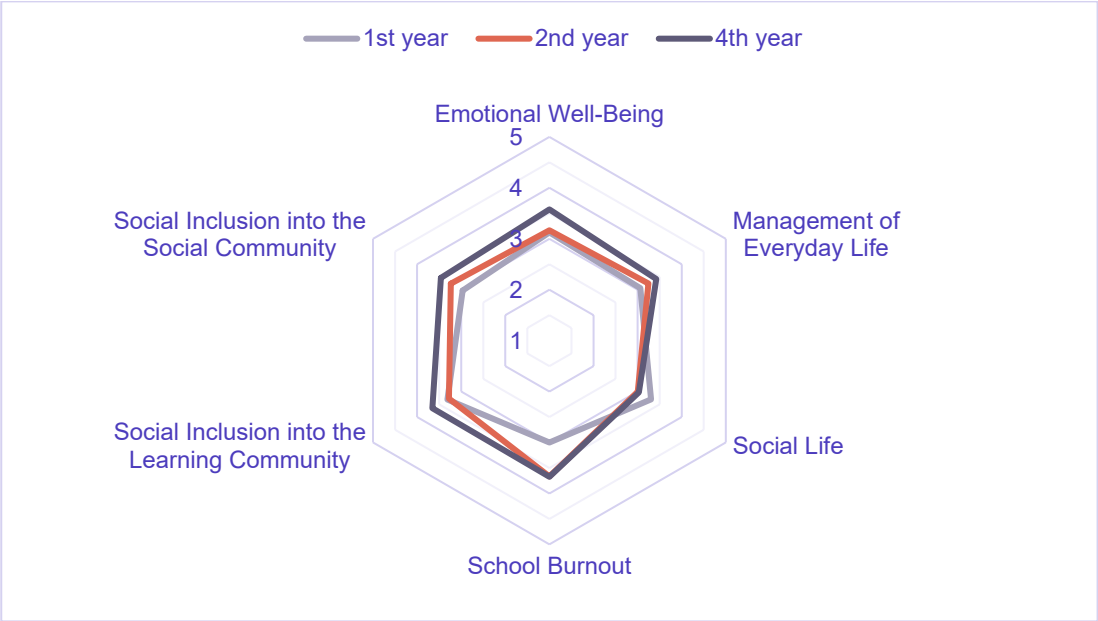


Note. A higher score on School Burnout indicates a lower degree of burnout. n = 702.

Figure 8 shows that students at Tradium between the first and third year of attendance experienced similar levels of inclusion and well-being on all dimensions
A slight difference was present for school burnout, which indicates that school burnout increases after the first year of attendance. The 2022 measurement indicates that burnout drops to a small extent (d = 0.20, p = 0.011) between the first and second year at Tradium, less than found in the baseline report (d = 0.74, p < 0.001; cf. Krogstrup et al., 2022). This is problematic since burnout and educational stress is known to lead to higher dropout intensions (Eicher et al., 2014; Krogstrup et al., 2021b). Hence, it's an ongoing challenge to sustain lower levels of burnout during the second and third year of attendance at Tradium.

In summary, school burnout tends to increase at Tradium after the first year of attendance, which was also found in the baseline report. The burnout levels increased less after the first year of attendance in 2022, but the average burnout level was unchanged (see Table 4).

Figure 9. Which year are you attending? (IAL FVG)



Note. One third-year student responded to the survey. Hence, this category was omitted, n = 79.

Figure 9 shows that the levels of inclusion and well-being for different years of attendance were also similar on most dimensions at IAL FVG. The students had somewhat larger levels of well-being during the second and fourth year, which was also found in the baseline report (cf. Krogstrup et al., 2022). However, this result could be random due to a low number of responses.

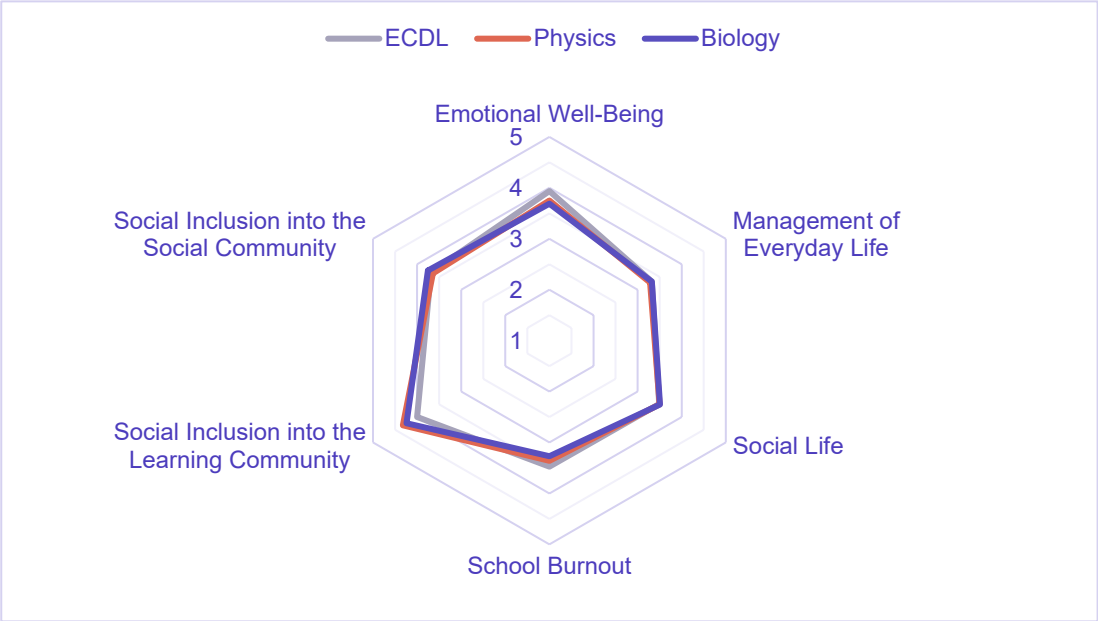
In summary, the results from the baseline report were replicated for IAL FVG, which could indicate a pattern. However, due to a low number of responses this result should be interpreted with caution.

FIELD OF STUDY AND SUBJECTS

Most students at GEM16+ (82.4%) reported studying four subjects or more. Although the students at GEM16+ can study multiple subjects, they can basically choose between ECDL (European Certificate of Digital Literacy), physics, and biology as their core subject (Government of Malta, 2022).

Since these subjects are primary at GEM16+, it is examined whether any variation is present based on the chosen subject matter (see Appendix E).

Figure 10. Well-being and inclusion by subject field (GEM16+)

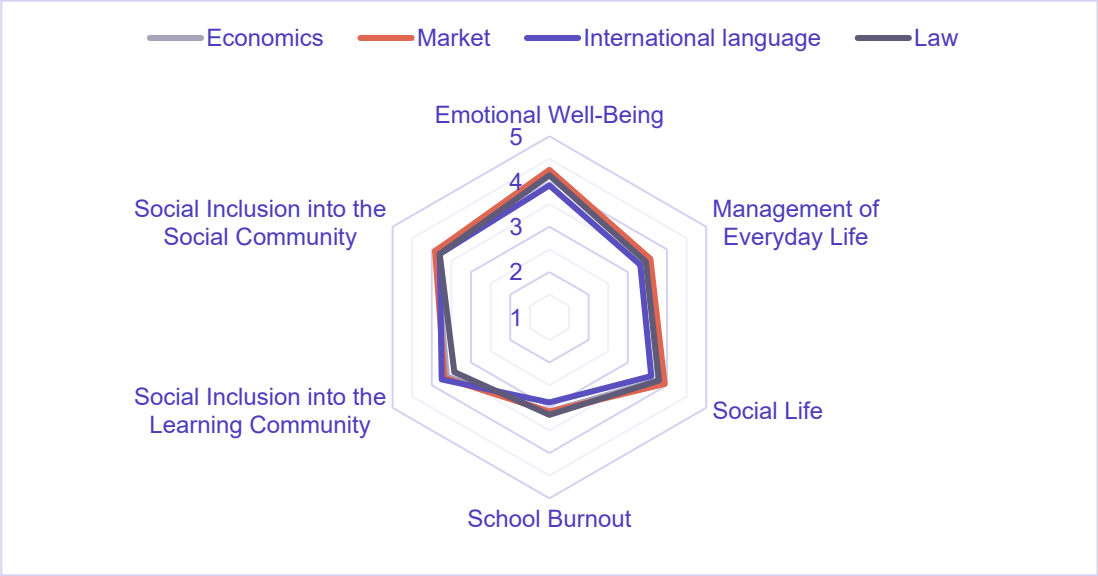


Note. n = 90

Figure 10 shows that no apparent difference was present at GEM16+ based on core subject field. The students had almost identical scores on all dimensions of well-being and inclusion. It is therefore concluded that levels of inclusion and well-being are not subject-specific at GEM16+.

At Tradium, the students could select 'Economics', 'Market', or 'International language'. In addition, they had the option to manually type another field of study. Of the students who answered 'Other', 33 students typed 'Law' as their main subject (see Appendix E). The categories contained sufficient responses (n > 30 is typically recommended; see Field, 2018), resulting in more generalisable findings.

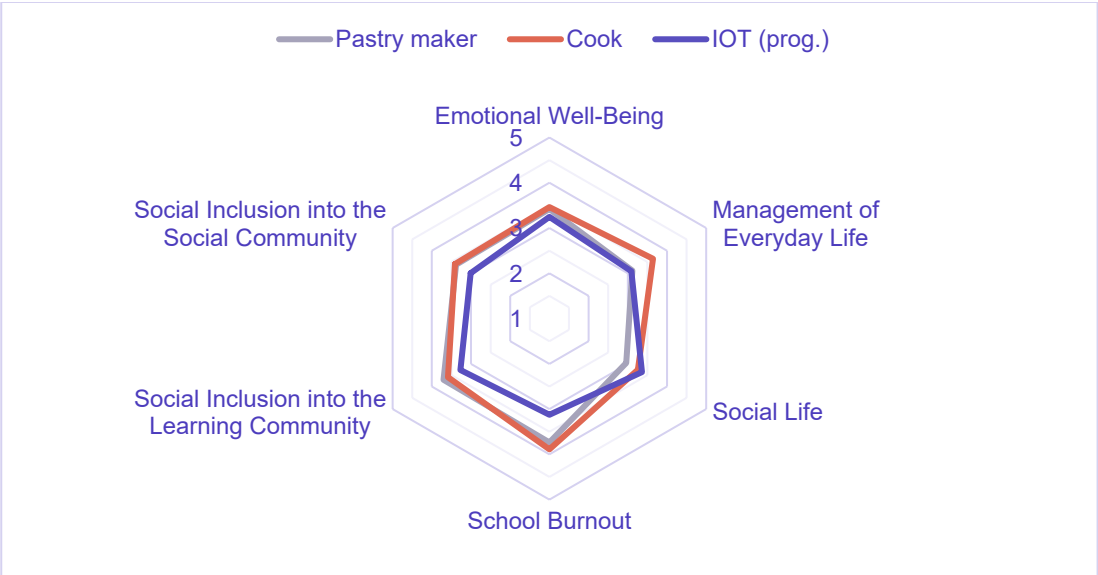
Figure 11. Well-being and inclusion by overall study field of study (Tradium)



Note. Of the 68 students who selected the category 'Other' 45 studied Law. *n* = 647.

Figure 11 shows that no apparent differences emerged on well-being and inclusion for overall study fields at Tradium. On all dimensions, the scores were above or close to the midpoint (*M* = 3). School burnout was the dimension on which the students scored the lowest. This suggest that school burnout is not a subject-specific problem at Tradium. Furthermore, students who studied market scored a bit higher on most dimensions, which was also found in the baseline report (cf. Krogstrup et al., 2022), but these differences should not be overinterpreted.

Figure 12. Well-being and inclusion by overall field of study (IAL FVG)



Note. *n* = 56.

Students at IAL FVG could write their response manually in the survey (see Appendix E for more information on these responses).

Figure 12 shows that students studying Internet of Things (programming) experienced less well-being and less inclusion on average compared to those who studied to become cooks or pastry makers. However, these results should be interpreted with caution since a few negative responses can easily affect the mean. For this reason, these results are uncertain (cf. Krogstrup et al., 2022).

4. CONCLUSION

Based on the main radar chart (Figure 3) and comparative analysis of the six dimensions of well-being and inclusion (Figure 4), the following is concluded:

- Students at Tradium experienced significantly higher emotional well-being than students at IAL FVG and GEM16+ (medium to large differences).
- Students at Tradium scored significantly higher on management of everyday life than students at GEM16+ and IAL FVG (small to medium differences).
- Students at Tradium experienced significantly more school burnout compared to students at IAL FVG (a moderate difference).
- Students at Tradium reported a significantly higher score on social life than students at IAL FVG and GEM16+ (moderate to large differences).
- Students at GEM16+ had a very high score on social inclusion into the learning community (M_{ed} = 5; M = 4.14), significantly higher than both IAL FVG and Tradium (moderate to large differences).
- Students at Tradium experienced significantly more social inclusion into the social community than students at IAL FVG (a large difference).

In summary, the findings suggest that all schools had positive well-being and inclusion scores (above each scale's midpoint). Still, the results also highlight specific dimensions on which attention could be focused to improve students' well-being and social inclusion. Tradium scored highest on four out of six dimensions, but this was surprisingly contrasted by their weak score on school burnout; GEM16+ had the second highest scores, including a strong score on social inclusion into the learning community; IAL FVG had the lowest scores overall, but they also had the least degree of school burnout.

Based on the analysis of the progression in well-being and social inclusion overall (2021–2022), the following is concluded (see Figure 3 and Tables 3–5).

- No statistically significant differences were confirmed between the first and second measurement round, which indicates that the students' sense of well-being and inclusion has remained unchanged/stable.
- Although no progression was observed between the measurement points, all mean scores (*M*) on the six dimensions were positive (*M* > 3 on scales from 1 to 5), indicating that the average level of well-being and social inclusion is positive overall in the three partnering VET/SCL schools.

For the measured background variables (x) and their influence on the six dimensions of well-being and inclusion (y), the following is concluded:

- At Tradium, females had slightly lower emotional well-being than males, which was expected (cf. Andersen, 2021; Lyyra et al., 2021).
- No significant gender difference in terms of well-being or inclusion was observed at IAL FVG or GEM16+.
- The physical study environment correlated significantly (often moderately) with all factors of well-being and inclusion. This suggests that students who experience the physical study environment as positive are more likely to experience higher well-being and social inclusion.
- In all partnering schools, the physical study environment was especially associated with social inclusion into the learning community (see Table 6).
- A chi-square (χ^2) test revealed that students at GEM16+ and Tradium rated the physical study environment higher than students at IAL FVG to a small extent ($\Phi_c = 0.11$; see Appendix C)
- Female and male students at IAL FVG and GEM16+ rated the physical study environment equally high, but at Tradium males rated the physical study environment a slightly higher than females on average.
- Family constellation did not have a significant impact on the six dimensions of well-being and inclusion, suggesting that this background factor is not a confounder of concern in this study (see Figure 7 and Appendix D).

In summary, females experienced lower emotional well-being at Tradium. Moreover, the quality of the physical study environment could be an important cause of well-being and social inclusion as these variables were often moderately correlated. Thus, enhancing the physical study environment could provide additional benefits in terms of increased well-being and perceived inclusion among students.

For the school-specific variables, the following is concluded:

- Although students at IAL FVG and GEM16+ with an apprenticeship agreement scored higher on well-being and inclusion compared to students without an apprenticeship agreement, there were too few respondents to generalise the results. Further information is needed to draw more accurate conclusions.

- No identifiable pattern was present for IAL FVG in relation to year of attendance because of too few respondents.
- Students at Tradium mostly experienced similar levels of inclusion and well-being across the three years of attendance. However, they experienced slightly higher burnout levels during the second and third year compared to the first ($p < 0.001$, $d = 0.20$). This difference was larger in the baseline report, but overall burnout levels have not improved.
- For the overall field of study or the specific subject fields, no important differences were evident at Tradium or GEM16+ in terms of students' well-being and inclusion. More information is needed to draw reliable conclusions.

In summary, no discernible pattern was present for students with/without an apprenticeship. The same applied to the overall field of study or specific subject fields since there were too few responses to draw any general conclusions. In relation to year of attendance, it was found that students at Tradium experienced higher levels of burnout after the first school year, which suggests that efforts should be made to reduce burnout among students after the first year of attendance.

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APPENDIX A

Table 7. Validity and reliability statistics of the six dimensions

Factor/index	No. items	Cronbach's alpha (α)	AVE
Emotional Well-Being (factor)	5	0.877	59.40%
Management of Everyday Life (index)	6	0.684	30.22%
Social Life (index)	7	0.786	39.29%
School Burnout (factor)	4	0.731	41.13%
Social Inclusion into the Learning Community (factor)	3	0.718	49.51%
Social Inclusion into the Social Community (factor)	4	0.695	40.08%

Note. AVE = Average variance extracted. Factors are assumed to reflect underlying constructs that are often regarded as psychological and/or social phenomena. Indices are (formative) theoretical constructions consisting of non-reflective items (Hair et al., 2019).

Methods applied: Principal axis factoring and reliability analysis.

Table 7 shows that the degree of internal validity was acceptable or high on all factors. AVE was very good on Emotional Well-Being and good on Social Inclusion into the Learning Community. This measure should ideally be above 50 percent for all reflective factors (Hair et al., 2019). However, many researchers argue that values below or close to this benchmark is acceptable if only reliability is established (Gaskin, 2022; Malhotra & Dash, 2011). Still, adaptions were made to the factors to optimise both validity and reliability (see Section 2.5).

Reliability was assessed using Cronbach's alpha (α), and it showed acceptable values on all factors: Emotional Well-Being was the most valid and reliable overall. For factors, Cronbach's alpha should preferably be above 0.7 in standard research or at least above 0.6 for exploratory analysis (Field, 2018; Nunnally, 1978).

For indices, the theoretical construction is primary, which is why Cronbach's alpha and AVE are not critical. In this sense, the indices were validated theoretically during the systematic review process and co-evaluated by students in a cooperative, co-creation process before data collection (cf. Krogstrup et al., 2021a).

APPENDIX B

Table 8. Multiple comparisons (univariate ANOVAs)

Hochberg's post hoc test [a]				95% CI	
Dependent variable			*p*-value	Lower Bound	Upper Bound
Emotional Well-Being	GEM16+	Tradium	< 0.001***	−0.66	−0.19
		IAL FVG	< 0.001***	0.17	0.82
	Tradium	GEM16+	< 0.001***	0.19	0.66
		IAL FVG	< 0.001***	0.67	1.16
	IAL FVG	GEM16+	< 0.001***	−0.82	−0.17
		Tradium	< 0.001***	−1.16	−0.67
Management of Everyday Life	GEM16+	Tradium	0.018*	−0.44	−0.03
		IAL FVG	0.974	−0.23	0.32
	Tradium	GEM16+	0.018*	0.03	0.44
		IAL FVG	0.004**	0.07	0.49
	IAL FVG	GEM16+	0.974	−0.32	0.23
		Tradium	0.004**	−0.49	−0.07
Social Life	GEM16+	Tradium	< 0.001***	−0.57	−0.14
		IAL FVG	0.001**	0.14	0.73
	Tradium	GEM16+	< 0.001***	0.14	0.57
		IAL FVG	< 0.001***	0.57	1.01
	IAL FVG	GEM16+	0.001**	−0.73	−0.14
		Tradium	< 0.001***	−1.01	−0.57
School Burnout	GEM16+	Tradium	0.095	−0.03	0.54
		IAL FVG	0.785	−0.52	0.25
	Tradium	GEM16+	0.095	−0.54	0.03
		IAL FVG	0.004**	−0.68	−0.10
	IAL FVG	GEM16+	0.785	−0.25	0.52
		Tradium	0.004**	0.10	0.68
Social Inclusion into the Learning Community	GEM16+	Tradium	< 0.001***	0.18	0.78
		IAL FVG	< 0.001***	0.34	1.15
	Tradium	GEM16+	< 0.001***	−0.78	−0.18
		IAL FVG	0.122	−0.05	0.57
	IAL FVG	GEM16+	< 0.001***	−1.15	−0.34
		Tradium	0.122	−0.57	0.05
Social Inclusion into the Social Community	GEM16+	Tradium	0.057	−0.44	0.01
		IAL FVG	0.002**	0.12	0.72
	Tradium	GEM16+	0.057	−0.01	0.44
		IAL FVG	< 0.001***	0.41	0.87
	IAL FVG	GEM16+	0.002**	−0.72	−0.12
		Tradium	< 0.001***	−0.87	−0.41

Note. [a] Hochberg's post hoc test was used as it corrects for bias when group sizes vary (Field, 2018). Significant differences are flagged with an asterisk (*) in the column '*p*-value'.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

APPENDIX C

In the following bivariate analysis, the differences in students' rating of the physical study environment are displayed for each of the partnering VET/SCL schools.

Table 9. Crosstabulation of the physical study environment by school

Dependent variable			Partnering VET/SCL			Total
			GEM16+	Tradium	IAL FVG	
Physical Study Environment	Very poor/poor	Count	10_a	142_a	25_b	177
		% Partnering VET/SCL	13.5%	21.3%	34.7%	21.8%
	Good/very good	Count	64_a	524_a	47_b	635
		% Partnering VET/SCL	86.5%	78.7%	65.3%	78.2%
Total		Count	74	666	72	812
		% Partnering VET/SCL	100%	100%	100%	100%

Note. Each subscript letter denotes a subset of partnering VET/SCL school categories whose column proportions do not differ significantly from each other at the 0.05 level. Zero cells (0%) have an expected count less than 5. The minimum expected count is 15.7.

$\chi^2(df) = 10.123(2)$, $p < 0.001$ (two-sided). Effect: $\Phi_c = 0.11$; BCa 95% CI = [0.05–0.19].[25]

Table 9 shows that 86.5% of the students at GEM16+ rated the physical study environment as good or very good. Only 13.5% of their students rated the physical study environment as poor or very poor. In comparison, 65.3% of the students at IAL FVG rated the physical study environment as good or very good while 34.7% of their students rated the physical study environment as poor or very poor. At Tradium, 78.7% of the students rated the physical study environment positively while 21.3% of their students rated it negatively. Across the three partnering schools, 78.2% rated the physical study environment positively.

The chi-square test (χ^2) showed that students at GEM16+ rated the physical study environment higher than students at IAL FVG to a small extent ($\Phi_c = 0.11$). Students at GEM16+ also rated the physical study environment the highest in the first measurement round in 2021 (Krogstrup et al., 2022). However, the differences among the schools were smaller in 2022 and some were no longer significant.

In addition, it was examined whether gender plays a role in relation to the physical study environment. In 2021, males and females rated the physical study environment equally high. However, in 2022 males at Tradium rated the physical study environment slightly higher than females, but the difference was small ($\Phi_c = 0.10$).

[25] Bootstrapped (bias-corrected) confidence intervals were calculated (cf. Field, 2018).

APPENDIX D

Table 10. Whom the student lives with or have lived with most of life

	GEM16+	Tradium	IAL FVG
Mother	86.7% (65)	93.6% (634)	90.5% (67)
Father	70.7% (53)	85.7% (580)	74.3% (55)
Sibling(s)	60.0% (45)	78.0% (528)	66.2% (49)
Total	75	677	74

Note. The students were presented with seven different multiple-choice categories, three of which are included in this table. The individual student could select a category on each question, meaning that the percentages are calculated from the total counts for each school. Counts/frequencies are included in brackets in the table cells. *N* = 826.

Table 10 displays that most students either live or have lived with their mother most of their lives (approx. 87–94%). A large percentage of students, but fewer compared to the first category, either live or have lived with their father most of their lives (approx. 71–86%), and the same applied to sibling(s) (approx. 60–78%).

Therefore, these three categories were included in the analysis on family situation.

APPENDIX E

Table 11. Which options are you enrolled to? (GEM16+)

	ECDL	Physics	Biology	Other [a]	Total
Percent	25.7%	44.6%	36.5%	14.9%	123%
Count	19	33	27	11	90

Note. Each student could select multiple options. [a] Nearly all students in this category studied a combination of mathematics, English, and Maltese.

Table 11 shows that most students at GEM16+ attended classes in physics, ECDL, or Biology, of which physics (44.6%) was the most commonly reported option. Of the students, 14.9% were enrolled in additional options (see the table note).

Table 12. Which overall field of study are you submitted to? (Tradium)

	Economics	Market	International Language	Law	Total
Percent	29.8%	56.6%	6.6%	7.0%	100%
Count	193	366	43	45	647

Note. Each student could select a single field of study.

Table 12 shows that most students at Tradium who answered the questionnaire selected 'Market' (56.6%). 'Economics' (29.8%) was the second most frequent category followed by 'Law' (7.0%) and 'International Language' (6.6%).

Table 13. Which overall field of study are you submitted to? (IAL FVG)

	Pastry maker	Cook	IOT (prog.) [a]	Total
Percent	35.7%	33.9%	30.4%	100%
Count	20	19	17	56

Note. 'Maker' was relabelled 'Pastry maker'; 'Chef' was relabelled 'Cook'. [a] IOT: Internet of things, programmer.

Table 13 shows that most students at IAL FVG participated in courses related to the service or restaurant industry. However, students at IAL FVG also participated in courses on beauty (e.g. beautician) or business (e.g. shop assistant). Only the three most popular subjects are shown in the table.