

Creation and content validation of an instrument for assessing children's engagement in school physical education classes

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Abstract - Objective: Construction of an instrument for assessing children's engagement in School Physical Education (SPE) classes and the testing of the content validity of this instrument. **Method:** An evaluative instrument, using direct observation, was constructed in the following stages: construction of the first version of the instrument, a pilot study, relevance analysis, and instrument restructuring. Content validation was performed by five expert judges who assessed each item according to three criteria - Language Clarity (LC), Practical Pertinence (PP), and Theoretical Relevance (TR) - using a Likert scale. The Content Validity Coefficient (CVC) was calculated across five analytical steps, generating item-level (CVC_i), final (CVC_f), and total (CVC_t). CVC_t > 0.80 were considered acceptable. The judges' critical comments were qualitatively analyzed and used to refine the final version of the instrument, which then underwent a new round of content evaluation by the same judges.

Results: The pilot study was applied, evaluating 15 students of both sexes, from two private schools in Fortaleza/CE. Ten students achieved adequate active participation, while 5 students had an average score between 2.2 and 2.4, being susceptible to improvements. The criterion LC generated the most divergence of opinion among the judges, in the behavioral dimension. Based on the judges' opinions, improvements were made to the instrument, and a new round of content evaluation showed that all criteria achieved acceptable CVC_t values.

Conclusion: The newly developed instrument shows satisfactory content validity and offers a reliable way for health and education professionals to assess children's engagement in SPE classes across different social contexts.

Keywords: engagement, school physical education, assessment, functioning.

Introduction

In School Physical Education (SPE) classes, the importance of organized and structured motor activity is observed, as it is through interactions with the environment, given directed tasks, that students can acquire a broader range of practical actions and experiences, in order to enhance their development¹. Therefore, SPE classes should provide a wide range of motor opportunities for students to explore their movement capacity, bodily expressions, and experience different motor actions in varied environments and challenges².

Thus, engagement in SPE classes is conceptualized as the active participation and effort of students³⁻⁵ and can be analyzed from three dimen-

sions: behavioral, cognitive, and emotional⁶. In the behavioral dimension, students' active involvement in activities is observed, along with their attempts. In the cognitive aspect, conversely, the attention a student is dedicating during explanations before practice, as well as during activities, can be identified. Finally, within the emotional dimension, student motivation is the determining factor⁶.

Perceiving the connection between these aspects of the individual, both in the area of development and in engagement, the need for studying and assessing student engagement in SPE classes is observed, so that the experiences proposed and presented can actively involve student participation. This active participation, or engagement in the SPE context, will directly rever-

berate in different areas of development, as well as in the observation and monitoring of that individual.

The concept of Functioning, according to the World Health Organization⁷, integrates body functions and an individual's capacity to perform fundamental daily tasks and activities, in addition to participation related to social aspects. Thus, a direct connection brought by the context of functioning, as well as by the stimuli from SPE classes, is inferred, given that they work on an individual's development in different and holistic aspects.

An integrative review on instruments for assessing engagement in SPE classes⁸ showed that most of the studies comprising it used questionnaires to be answered by the students themselves according to their perception and/or interest. However, this generated a discussion regarding the possibilities that the questionnaires applied may be limited for assessing the engagement of younger children and those with developmental disorders or other health conditions, making an observational instrument of interest.

Given this, understanding the limited number of observational engagement assessment instruments in the SPE context, as well as their importance in impacting individuals' motor, emotional, and social development, being directly linked to the concept of functioning, the present study aims to construct an instrument for assessing the engagement of early elementary school students in SPE classes and to test the content validity of this instrument. Furthermore, the possibility of applying this instrument without restrictions is sought, encompassing the entire target audience, regardless of health conditions or disorders, aiming for a sensitive assessment instrument for all children. Thus, the instrument could be used by different professionals, such as psychologists, physical therapists, physical education professionals, among others, in order to observe and understand how a child behaves in an uncontrolled and clinical context, perceiving the

impacts of their intervention and assisting in the planning of future interventions.

Methods

Search type

This is a methodological study on the construction of an evaluative instrument. The present study was approved by the Ethics Committee of the Federal University of Ceará (n. 86256624.7.0000.5054).

Participants and materials

The study's sample was comprised of 15 randomly chosen early elementary school students, of both sexes, attending from the 1st to the 4th grade, participating in SPE classes, and duly enrolled in two private educational institutions in the city of Fortaleza. The inclusion criterion was having authorization to participate through the signing of the Free and Informed Consent Form (FICF) by parents or guardians. The exclusion criterion was not present on the day of the observer's observation. Furthermore, the waiver of the Minor Assent Form was requested, as the students were not aware they were being evaluated, so as not to influence their behavior during class.

Additionally, eight expert judges were invited via email for the instrument's content validation process. However, only five responded positively to participate in the present study, meeting the quantity suggested by Pasquali⁹, in which three is the minimum number. Table 1 presents data on the judges' education and experience. Finally, six evaluators - licensed professionals (five in Physical Education and one Pediatric Physical Therapist) - participated in the pilot study by assessing the children.

For the application of the instrument during the observation of students in SPE classes, the evaluation form developed in the present research (Instrument for

Table 1 - Data on sex, education, qualifications and experience of the expert judges in this study.

Judge (sex)	Academic background	Degree	Year of completion	Experience
Judge 1 (M)	Physical education	Master's degree - Physical education	2023	School physical education
Judge 2 (M)	Physical education	Doctor - Sports science	2018	Motor behavior and school physical education
Judge 3 (M)	Physical education	Doctor - Human movement sciences	2017	Motor Behavior and sports psychology
Judge 4 (M)	Physical education	Doctor - Special education	2014	Behavior analysis
Judge 5 (F)	Physical education	Doctor - Physical education and sports	2020	Sports pedagogy

F = Female; M = Male.

Assessing Engagement in School Physical Education Classes), the instrument explanation form, the list of students in the class, a stopwatch, a clipboard, and a ballpoint pen were required for the evaluator's use.

Procedures

The development stages of the present study consist of: (1) construction of the first version of the assessment instrument, (2) a pilot study, so that this instrument can be applied in its first version, (3) analysis of the relevance and restructuring of the instrument based on the pilot study, (4) evaluation by an expert committee for instrument analysis, (5) content and construct validation of the instrument, (6) data analysis, for verification of reliability and trustworthiness, (7) production of the final version of the instrument. The procedures presented were based on the study by Chomem and collaborators¹⁰.

The construction of the engagement assessment instrument was based on existing instruments, identified by Marques, Sousa, and Ferracioli⁸, such as the Course Engagement and Disaffection Scale in Physical Education (CEDS-PE) used in the study by Rodrigues-Medellín and collaborators¹¹. Thus, the items of the created instrument were based on questions from students' self-reported questionnaires, as well as on engagement variables reported by studies within the context of SPE classes, such as participation in the central activity of the class, the execution of motor responses, and waiting during the teacher's explanation¹².

The created instrument consists of a header for identifying the evaluator and the child, as well as the name of their educational institution, grade, number of students in the class, observation time, evaluation date, among other information. The content is composed of 12 items in total, divided into three domains - cognitive, emotional, and behavioral, with four items in each domain. The evaluator responsible for applying the instrument has 45 s for student observation and then 45 s for notation in response to the items.

Thus, the instrument was applied in a pilot study with 15 students of both sexes, some with specific health condition. After the application of the first version of the instrument in two SPE classes, small adjustments were made for better comprehension, according to the doubts of the volunteer evaluators. Following the application of the engagement assessment instrument's pilot study, the students' engagement level was evaluated through the resulting score, which was obtained from a Likert scale, being (1) negative, (2) partially, and (3) totally - complete agreement. Therefore, the higher the score, the greater the engagement, and the lower the score, the lower the student's engagement.

Next, the analysis of the instrument's relevance and restructuring were performed based on the pilot study's evaluation by a committee of expert judges. Using a five (5)-point Likert scale, the instrument was evaluated to investigate the clarity and relevance of each item, thereby enabling individual content analysis by the expert judges. After being invited to participate virtually and individually, each expert judge received an electronic form containing the FICF, the instrument's evaluation sheet along with a brief explanation about the topic and the evaluation process, and the instrument itself to be evaluated. Therefore, to enable the demonstration of the instrument's validity, content validation was used¹³.

In content validation, each judge evaluated each of the instrument's items concerning Language Clarity (LC), Practical Pertinence (PP), and Theoretical Relevance (TR), assigning a score from one to five, where 1- Very Little; 2- Little; 3- Average; 4- Much; 5- Very Much. The guiding questions were: LC - "Is the language of each item sufficiently clear and understandable for future evaluators?"; PP - "Are the proposed items pertinent according to each dimension of engagement?"; and TR - "Is each item representative of the construct intended to be measured or aspects thereof, considering the theory?". Finally, the judges had the opportunity to record their opinions and suggestions for changes or additions to the instrument. Based on this evaluation, the instrument was restructured and a new round of evaluation by the judges was conducted. Based on this evaluation, the instrument was restructured and a new round of evaluation by the judges was conducted.

Data analysis

For content validation, the Content Validity Coefficient (CVC) was calculated to assess whether the items align with their objective, based on analysis and the judges' consensus according to each criterion (LC, PP, TR).

Based on the judges' responses in the first and second rounds of instrument evaluation, the CVC calculation occurs through five stages. Firstly, the means of each item's scores (M_x) are calculated, being the sum of the obtained scores divided by the number of judges. In the second stage, the initial CVC of each item (CVC_i) is calculated by dividing M_x by the maximum value ($V_{m\acute{a}x}$) the item could receive, in the case of the Likert scale. In the third stage, the error (Pei) is calculated, given by dividing one (1) by the number of judges (N), raised to the power of the number of judges, thus, $Pei = (1/N)^N$. In the fourth stage, the final CVC of each item (CVC_f) is calculated by subtracting CVC_i by Pei . In the last stage, the total CVC (CVC_t) of the instrument is calculated for each criterion (LC, PP,

and TR), performed by subtracting the mean of CVCi (MCVCi) by the mean of Pei (MPei). Given this, items with CVCt > 0.80 are considered acceptable¹⁴. The distribution of item scores (CVC: equal to or below 0.60; between 0.61 and 0.80; and above 0.80) was presented through relative frequency (%). Finally, the critical comments and suggestions from the expert judges regarding the instrument are qualitatively analyzed. The level of student engagement with the proposed instrument was analyzed using descriptive statistics.

Results and discussion

Construction and content validation of an engagement assessment instrument

The first version of the instrument consisted of a header with the necessary data for recording the child, the school, and the evaluator, and 12 questions for the evaluator's response, with four questions for each dimension of engagement - behavioral, cognitive, and emotional. These questions were analyzed using three criteria: Language Clarity (LC), Practical Pertinence (PP), and Theoretical Relevance (TR). The following tables (Tables 2, 3, and 4) respectively present the criteria and represent the initial version of the instrument along with the Content Validity Coefficient (CVC).

Given the CVC calculation, it was observed that the LC criterion was what most generated divergences of opinion among the expert judges. In all three

dimensions of engagement, the LC criterion was below the values considered acceptable, between 77% and 80%, especially in the behavioral dimension, where it obtained the lowest total CVCt score of 77%, suggesting improvements. The PP and TR criteria had a CVCt between 81% and 85%, across all dimensions of engagement, being evaluated within acceptable values, i.e., a value greater than 80%¹⁴.

Additionally, the comments from the Expert Judges were qualitatively analyzed and taken into consideration during the instrument's restructuring. Thus, the instrument was re-evaluated, particularly concerning the Language Clarity criterion in the behavioral dimension, and the "Not Applicable" (NA) response option was added to the proposed instrument.

By qualitatively analyzing the expert judges' comments and suggestions, the necessary adjustments were made to improve the interpretation and response to the items. Chart 1 presents the judges' comments when evaluating the instrument and the resulting changes made to the instrument's items for the final version.

Thus, analysis of the expert judges' comments indicated the need to improve the clarity and comprehension of certain instrument items. Based on these contributions, more detailed information was added to the supplementary explanatory material, and adaptations were made to the instrument, including item restructuring and the removal of the item "did the student need more information compared to other students?".

Table 2 - Content Validity Coefficient regarding Language Clarity (LC) of the child engagement assessment instrument.

Dimension	Question	M _x	CVC _i	Pe _i	CVC _f	mean CVC _i	mean Pe _i	CVC _t
Behavioral	Does the student show attention to the class proposal?	3.8	0.7600	0.0003	0.7597	0.7800	0.0003	0.7797
	Does the student try to perform the proposed class activities?	4.0	0.8000	0.0003	0.7997			
	Does the student perform appropriate motor responses?	3.6	0.7200	0.0003	0.7197			
	Does the student perform activities contextualized with the class?	4.2	0.8400	0.0003	0.8397			
Cognitive	Does the student ask contextualized questions in class?	3.4	0.6800	0.0003	0.6797	0.8100	0.0003	0.8097
	Does the student wait for the teacher's explanation?	4.4	0.8800	0.0003	0.8797			
	Does the student understand what was requested by the teacher?	4.0	0.8000	0.0003	0.7997			
	Did the student need more information compared to other students?	4.4	0.8800	0.0003	0.8797			
Emotional	Is the student motivated or does the student motivate other students?	4.4	0.8800	0.0003	0.8797	0.8100	0.0003	0.8097
	Does the student show interest in class activities?	3.6	0.7200	0.0003	0.7197			
	Does the student seem to enjoy the class?	4.4	0.8800	0.0003	0.8797			
	Does the student demonstrate emotions with success and/or failure?	3.8	0.7600	0.0003	0.7597			

M_x: Mean of scores for each item; CVC_i: Initial content validity coefficient for each item; Pe_i: Error; CVC_f: Final content validity coefficient for each item; CVC_t: Total content validity coefficient.

Table 3 - Content Validation Coefficient regarding Practical Pertinence (PP) of the child engagement assessment instrument.

Dimension	Question	M _x	CVC _i	Pe _i	CVC _f	mean CVC _i	mean Pe _i	CVC _t
Behavioral	Does the student show attention to the class proposal?	4.2	0.8400	0.0003	0.8397	0.8600	0.0003	0.8597
	Does the student try to perform the proposed class activities?	4.2	0.8400	0.0003	0.8397			
	Does the student perform appropriate motor responses?	4.4	0.8800	0.0003	0.8797			
	Does the student perform activities contextualized with the class?	4.4	0.8800	0.0003	0.8797			
Cognitive	Does the student ask contextualized questions in class?	4.4	0.8800	0.0003	0.8797	0.8400	0.0003	0.8397
	Does the student wait for the teacher's explanation?	4.2	0.8400	0.0003	0.8397			
	Does the student understand what was requested by the teacher?	4.0	0.8000	0.0003	0.7997			
	Did the student need more information compared to other students?	4.2	0.8400	0.0003	0.8397			
Emotional	Is the student motivated or does the student motivate other students?	4.4	0.8800	0.0003	0.8797	0.8500	0.0003	0.8497
	Does the student show interest in class activities?	4.2	0.8400	0.0003	0.8397			
	Does the student seem to enjoy the class?	4.2	0.8400	0.0003	0.8397			
	Does the student demonstrate emotions with success and/or failure?	4.2	0.8400	0.0003	0.8397			

M_x: Mean of scores for each item; CVC_i: Initial content validity coefficient for each item; Pe_i: Error; CVC_f: Final content validity coefficient for each item; CVC_t: Total content validity coefficient.

Table 4 - Content Validation Coefficient regarding Theoretical Relevance (TR) of the child engagement assessment instrument.

Dimension	Question	M _x	CVC _i	Pe _i	CVC _f	mean CVC _i	mean Pe _i	CVC _t
Behavioral	Does the student show attention to the class proposal?	4.0	0.8000	0.0003	0.7997	0.8200	0.0003	0.8197
	Does the student try to perform the proposed class activities?	4.0	0.8000	0.0003	0.7997			
	Does the student perform appropriate motor responses?	4.2	0.8400	0.0003	0.8397			
	Does the student perform activities contextualized with the class?	4.2	0.8400	0.0003	0.8397			
Cognitive	Does the student ask contextualized questions in class?	4.2	0.8400	0.0003	0.8397	0.8300	0.0003	0.8297
	Does the student wait for the teacher's explanation?	4.2	0.8400	0.0003	0.8397			
	Does the student understand what was requested by the teacher?	4.0	0.8000	0.0003	0.7997			
	Did the student need more information compared to other students?	4.2	0.8400	0.0003	0.8397			
Emotional	Is the student motivated or does the student motivate other students?	4.2	0.8400	0.0003	0.8397	0.8400	0.0003	0.8397
	Does the student show interest in class activities?	4.2	0.8400	0.0003	0.8397			
	Does the student seem to enjoy the class?	4.2	0.8400	0.0003	0.8397			
	Does the student demonstrate emotions with success and/or failure?	4.2	0.8400	0.0003	0.8397			

M_x: Mean of scores for each item; CVC_i: Initial content validity coefficient for each item; Pe_i: Error; CVC_f: Final content validity coefficient for each item; CVC_t: Total content validity coefficient.

In addition to the comments presented in Chart 1, other relevant observations emerged. Judge 2 highlighted the difficulty in dividing Engagement into domains, stating: "Perhaps the greatest limitation lies in trying to define the dimensions of engagement observation, as they are not always clearly defined in the questions". Judge 4 suggested changing the title of

a domain: "The term 'behavioral' dimension does not facilitate understanding of the meaning... my suggestion would be 'attentional', or something related to learning readiness". Although these comments were not incorporated into the final version of the instrument - given that the adopted literature considers three dimensions (behavioral, cognitive, and emotional) of

Chart 1 - Expert judges' comments and restructuring of instrument items.

Dimension and original Question	Comments and suggestions from the Expert Judge	Changes to the instrument Item
Behavioral Dimension: "Does the student show attention to the class proposal?"	J3: "The question "Does the student show attention to the class proposal?" Wouldn't it be better like this? "Does the student demonstrate attention to the class proposal?"	"Does the student demonstrate attention to the class proposal?"
Behavioral Dimension: "Does the student seek to perform the activities proposed in class?"	J4: "The expression "seeks to perform" is not operationalized, as is: "student understands what was requested"	"Does the student perform the activities proposed in class?"
Cognitive Dimension: "Does the student ask contextualized questions in class?"	J3: "Does the student ask contextualized questions in class? Does this mean the student is paying attention and can follow (i.e., they are involved in the class) what is being taught in class, or is the idea that the student can express their doubt by formulating a situation or context that aligns with what is being discussed in class? If option 1 is true, I thought of a suggestion: Does the student ask questions that show they are attentive and can follow the class?"	"Does the student ask questions that show they are attentive and can follow the class?"
Emotional Dimension: "Does the student demonstrate emotions with success and/or failure?"	J2: "Item 12, "Does the student demonstrate emotions with success and/or failure?" I suggest defining the emotions, for example, frustration in failure and/or euphoria in success"	"Does the student demonstrate frustration in failure and/or euphoria in success during class activities?"

J: Expert Judge.

Engagement⁶ - they highlight an important tension between established theoretical models and their application in practical educational contexts. Acknowledging this tension is essential, as it may guide future refinements of the instrument, including the possible redefinition of dimensions to enhance ecological validity.

After the instrument was restructured, the judges were asked to complete a new round of evaluation, now of the final version of the instrument. The CVCT results from the second evaluation round are presented in [Table 5](#).

As observed, the new evaluation by the judges showed that all criteria assessed in the content validation were acceptable (CVCT > 0.80), indicating that the improvements proposed after the initial methodological stages were appropriate.

Application of the engagement assessment instrument

Following alignment with the evaluators, consisting of an explanation of the study and the instrument, a test observation round was conducted to ensure no doubts regarding the application of the assessment instrument. During the practical application, in a meeting with the evaluators, it was decided to exclude the fourth item of the cognitive dimension, "did the student need more information compared to other students?". This was due to its redundancy, as it was similar to the previous item, "does the student understand what was requested?", and because of the question's ambiguity,

as it raises the question of whether the student needed more information pertinent to that moment and class activity or if it was more information due to a lack of attention during the teacher's explanation. Therefore, the exclusion of the item was decided upon.

In dialogue with the evaluators and observing the needs for instrument explanation, the header was restructured, increasing information such as grade/class and observed class time, in addition to adding the scoring legend, where (1) negative response, (2) partially, (3) positive response, and (NA) not applicable - in cases of water breaks or practical moments where a certain behavior is not observed.

A total of 15 children were observed for the purpose of evaluating the applicability of the present instrument in SPE classes. [Table 6](#) is presented below, regarding the evaluation of children according to their engagement in classes.

From this table, it is observed that values closer to 3 or those reaching a certain value indicate students who are more engaged in SPE classes. This is because, based on the item questions, negative responses (1) suggest less engagement, while positive responses (3) suggest greater engagement. Given this, out of the 15 students observed in Physical Education classes, 10 students obtained an average score between 2.5 and 2.9, which could indicate adequate engagement. However, 5 students obtained scores between 2.2 and 2.4, which could indicate lower engagement during the class.

Table 5 - Content Validation Coefficient of the final version of child engagement assessment instrument.

Dimension	Question	Language clarity (LC)			Practical pertinence (PP)			Theoretical relevance (TR)		
		mean CVC _i	mean Pe _i	CVC _t	mean CVC _i	mean Pe _i	CVC _t	mean CVC _i	mean Pe _i	CVC _t
Behavioral	Does the student demonstrate attention to the class proposal?	0.9375	0.0039	0.9336	1.0000	0.0039	0.9961	0.9750	0.0039	0.9711
	Does the student perform the activities proposed in class?									
	Does the student perform appropriate motor responses?									
	Does the student perform activities contextualized with the class?									
Cognitive	Does the student ask questions that show they are attentive and can follow the class?	0.9500	0.0039	0.9461	0.9333	0.0039	0.9294	0.9000	0.0039	0.8961
	Does the student wait for the teacher's explanation?									
	Does the student understand what was requested by the teacher?									
Emotional	Does the student demonstrate motivation or motivate other students?	0.9625	0.0039	0.9586	0.9750	0.0039	0.9711	0.9875	0.0039	0.9836
	Does the student show interest in class activities?									
	Does the student seem to enjoy the class?									
	Does the student demonstrate frustration in failure and/or euphoria in success during class activities?									

CVC_i: Initial content validity coefficient for each item; Pe_i: Error; CVC_t: Total content validity coefficient.

Table 6 - Average score and relative frequency (%) of Not Applicable (NA) of the engagement of children participating in the physical education class, assessed through this instrument.

Participant	Sex	Series*	Dimension			Total
			Behavioral	Cognitive	Emotional	
S1	F	2°	2.5 (30.0% NA)	2.0 (22.2% NA)	2.2 (11.7% NA)	2.2
S2	F	3°	2.3 (0.0% NA)	1.8 (33.3% NA)	2.5 (14.0% NA)	2.3
S3	F	1°	2.7 (0.0% NA)	2.5 (30.7% NA)	2.5 (0.0% NA)	2.6
S4	M	3°	2.6 (0.0% NA)	2.9 (31.2% NA)	2.7 (0.0% NA)	2.7
S5	M	1°	2.5 (0.0% NA)	2.3 (30.7% NA)	2.0 (9.6% NA)	2.3
S6	M	4°	2.7 (36.2% NA)	2.4 (35.0% NA)	2.5 (30.0% NA)	2.5
S7	M	4°	2.6 (17.5% NA)	2.4 (45.0% NA)	2.5 (25.0% NA)	2.5
S8	F	4°	2.9 (1.2% NA)	2.9 (30.0% NA)	3 (1.2% NA)	2.9
S9	M	3°	2.8 (6.6% NA)	2.8 (28.0% NA)	2.9 (6.6% NA)	2.8
S10	F	3°	2.9 (13.3% NA)	2.9 (42.2% NA)	2.8 (16.6% NA)	2.9
S11	M	3°	2.7 (15.0% NA)	2.4 (14.4% NA)	2.3 (8.3% NA)	2.5
S12	F	3°	2.9 (30.0% NA)	2.2 (55.5% NA)	2.5 (30.0% NA)	2.6
S13	M	2°	2.8 (0.0% NA)	2.7 (24.4% NA)	3 (1.6% NA)	2.8
S14	F	2°	2.7 (30.0% NA)	2.2 (31.1% NA)	2.3 (6.6% NA)	2.4
S15	F	4°	2.5 (30.0% NA)	2.0 (22.2% NA)	2.2 (11.7% NA)	2.3

S = Identification of the participating child; F = Female; M = Male. *Elementary school - initial years.

The results for the average score are determined individually, considering the number of “NA” marked in that evaluation, thus utilizing only relevant observation moments, excluding water breaks or times when the questions are not applicable.

Thus, the importance of the instrument within the context of an individual's functioning is understood. In this context, the domain of activities and participation is determined by individual abilities to perform a task, by the action of daily routine, and by the individual's interaction in society in various situations, such as cultural and behavioral ones¹⁵. Therefore, understanding that an individual is not detached from the environment in which they live, but that it is necessary to stimulate social skills, as well as execute motor tasks that will impact their daily life, the value of active student participation in SPE classes is perceived, given that this environment provides various stimuli.

The benefits of recognizing student engagement in SPE classes occur for the purpose of improving students' social and physical activity practices, along with their integration into a distinct and plural context, different from clinical intervention, for example, made possible in an environment with diverse and uncontrolled stimuli.

The pilot study sample comprised only 15 students from two private schools, which represents a significant limitation to the generalization of the findings. Additionally, the content addressed in a given class may generate greater or lesser student engagement, impacting their score, however, in the current instrument, the content of the classes is not specified, suggesting that it could be added in a future update of the instrument. Furthermore, the difficulties in creating an instrument with few references are highlighted, considering that most existing instruments are self-reported or in a different context than SPE classes.

Nevertheless, we believe that the instrument developed represents a methodological advance in the assessment of engagement in SPE classes, particularly for younger children and those with developmental disorders or other health conditions. Unlike self-report questionnaires, which rely on cognitive and linguistic abilities often limited in these populations, the proposed observational instrument captures engagement directly through behavior in the natural class context. This approach is consistent with the International Classification of Functioning, Disability and Health⁷ framework, as it assesses functioning through the interaction of body functions, activities, and participation while considering contextual factors. Accordingly, the instrument broadens applicability across different functional profiles and offers a more sensitive and inclusive alternative for understanding children's engagement in SPE classes.

Finally, it is suggested that in a future study, the next stages of instrument validation be carried out so that it may thus become a tool with stronger theoretical and scientific grounding in assessing engagement within the proposed context.

Conclusion

The present study achieved its main objective, which consisted of the construction of an instrument for assessing children's engagement in SPE classes, as well as the content validation carried out through the evaluation of expert judges. After the content validation process and meetings with the evaluators, who applied the study in practice, the instrument was restructured to reach its final version.

Given the context of individual functioning, it is concluded that the engagement assessment instrument in SPE classes, resulting from the present study, is significant. The contribution of such an instrument is made through the observation of the child in an uncontrolled context with multiple stimuli and aspects, contributing to a more precise intervention or one with appropriate adaptations for each child and their specificities.

The instrument aims to be usable by education and health professionals, which appears to have been achieved. Thus, it is expected that the use of this instrument can assist children in achieving holistic development within their possibilities and interventions, from a social, emotional, and motor context, striving for adequate functioning in its entirety.

AI use statement

No AI was used in this research.

Author contributions (CRediT)

Lara Almeida Marques: conceptualisation, investigation: methodology, data curation, writing - original draft. **Carla Thais de Sousa Oliveira:** data curation, writing - original draft, visualisation, writing - review and editing. **Marcela de Castro Ferracioli Gama:** conceptualisation, investigation: methodology, data curation, writing - original draft, writing - review and editing, visualisation.

Data availability statement

We declare, for all due purposes, that the research data is available in the body of the document.

Conflict of interest statement

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the

contents of the manuscript and there is no financial interest to report.

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