



# Measuring Student Engagement In A High School Context

Manoj Nair\*

Department of psychology, University of Tasmania, Churchill Ave, Hobart, TAS, Australia

\*Corresponding author: Manoj Nair, Department of psychology, University of Tasmania, Churchill Ave, Hobart, TAS, Australia

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## Abstract

The topic of student engagement is of considerable interest among researchers, practitioners and policymakers in education owing to its high correlation with academic achievement and school completion [1-5], mental health [6,8], and unproductive behaviour in schools [9-12]. Also, engagement as a multidimensional and interdisciplinary construct appears to offer a richer insight into how students think (cognition), act (behaviour), and feel (affect) at school than research on any other single dimension [13-17].

## Introduction

Furthermore, student engagement has important policy implications, especially in an Australian high school context where securing a high Year 12 attainment rate has been cited as an important objective [5,9,11], professed to be closely linked to developing national productivity and increasing human capital [19-21]. Notably, over 25% of young people across Australia (and over 40% in the state of Tasmania) do not complete Year 12 or its equivalent [22], with over one-third being stressed about high school [23], and over 40% disengaging from learning in high schools [24].

Thus, educators (teachers, senior school staff) continuously devising interventions to promote engagement in high schools [25-27]. However, addressing low student engagement appears to be a significant contributor to teacher stress and burnout since it occupies most of their planning and teaching time and hinders their ability to teach effectively [15,19,20]. Additionally, educators often struggle to understand why and how much their students are engaged, or otherwise, in school [28-31]. Consequently, they often rely, somewhat inaccurately, on their intuition or inferences (from observation and experiences) or readily available behavioural data or student demographics to inform and design interventions that promote student engagement in their schools [32-34]. As a result, wide variations are noticed in the practices followed and the outcomes achieved in different high schools [30]. Given that student engagement has the potential to address the significant issue of low educational attainment in high schools [35,36], it is imperative to find a systematic (replicable) way of measuring student engagement to better inform the interventions that promote it. The first and essential step in managing something well is to measure it accurately [37].

Thus, to promote students' engagement sustainably through relevant interventions, so they stay productive and longer in schools [38], we need to start by finding a systematic way to measure it. However, it is easier said than done, since the topic of engagement, in addition to being a relatively new one (first appearing in literature in the 1980s), appears to be a latent and complex metaconstruct [39-42]. Thus, there might be some pending clarifications regarding theoretical underpinnings, definition, attribution, factorisation, data collection and interpretation, and therefore measurement surrounding the topic of engagement. So, the purpose of this document is to provide such clarifications (when needed) by undertaking a literature review. Furthermore, this document concludes by offering a considered view on the inquiry question-is there a valid and reliable way for educators to measure latent psychological constructs such as student engagement in a high school context?

Beginning with the exploration of the influential theories that inform the definition of engagement, it would appear that there are three prominent ones: the participation- identification model, the self-system motivational model, and the person-environment perspective [43]. The participation-identification model explains the interdependent and cyclical relation of a student's participation in school activities (behavioural engagement) with the value attached to the school (emotional engagement) [44,45]. The self-system motivational model illustrates how the classroom context (i.e., structure, autonomy, support, and involvement) influences the students' action (cognitive, behavioural, and emotional engagement) through the mediation of students' self-system processes (competence, autonomy, and relatedness) [46-50]. The person-environment perspective connects students' engagement to the fit between their needs and goals and the opportunities

provided by their environment to meet them [25,26]. Together, the theories help to build a conceptual framework on engagement that integrates the personal (self), family (or home), social (peers), and other environmental (teachers, school) factors that might influence it [51-54].

Now, there have been as many as nineteen different definitions of engagement due to the variations in the scholarly interpretations of the concept between 1985 and 2008 [55]. Subsequently, there have been attempts to arrive at a standard [55-58].

An acceptable and comprehensive definition of student engagement appears to include three essential aspects:

- 1) engagement as a relationship that students have with education (teachers, classrooms, learning resources, schools, etc.) [59-61];
- 2) engagement as multidimensional-comprising of the three interrelated dimensions of cognition, affect or emotion, and behaviour [62-65] and
- 3) engagement as a process in constant flux (malleable-strengthening and weakening depending on the quality of interactions that the student has with education over time) [65,66] as outlined in Figure 1.

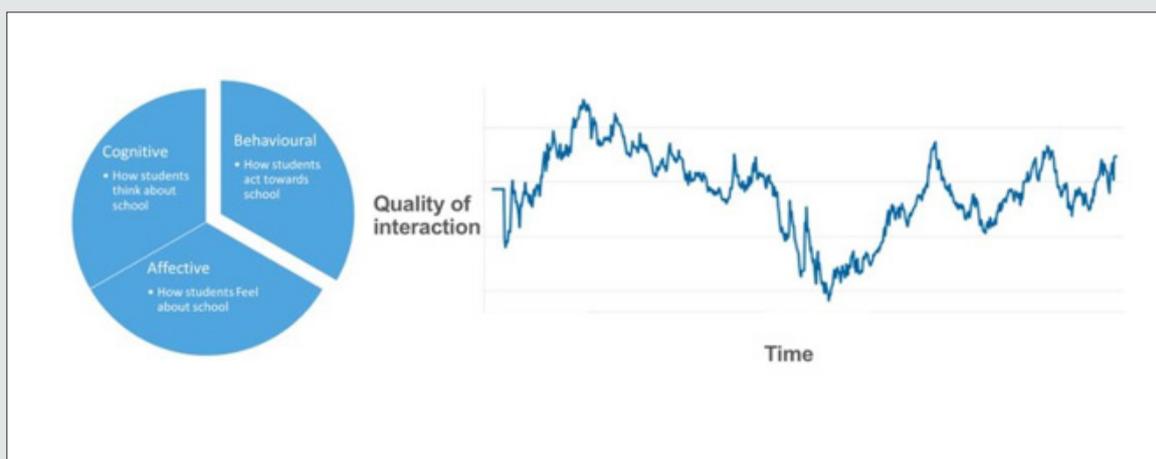


Figure 1: Engagement as a students relationship with education over time [67].

Furthermore explain engagement as both a psychological state and a behaviour, and ever since the seminal work of Finn and the causal link between affective and cognitive engagement with behavioural engagement has been made clear – put simply, if a student feels safe and emotionally connected to a school, and is able and interested in the work, he or she is more likely to participate effectively in the learning program [67-69], as outline in Figure 2. However, to accurately attribute the impact of engagement, it is essential to distinguish between its dimensions, influencers, and

manifestations [70]. Influencers are what cause student engagement to fluctuate in the school context—they could be student-related [51,47,55], or school and teacher-related [28] or family and peer support related [35]. On the other hand, manifestations such as academic performance and educational attainment result from students engaging in schools [71]. Often, schools include easily observable behavioural engagement dimensions such as attendance or truancy (unexplained absences) as manifestations for conceiving the interventions to improve them.

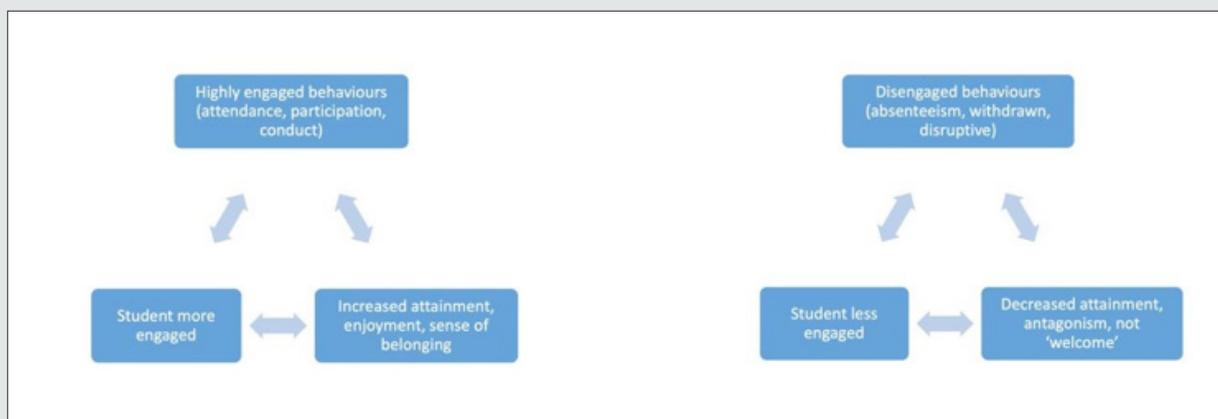


Figure 2: Engagement is a process that is reciprocal and compounding [67].

However, such an approach can be problematic since it makes it difficult to ascertain the effects of the engagement dimensions on its manifestations [72]. Also, engagement might need to be conceptualised and measured separately from disengagement or disaffection [34,38,41]. Additionally, it is essential to clarify the relationship between motivation and engagement in that the latter represents the action (behavioural) or interest (cognitive) component of the former [73,74]. Thus, with such clarifications on proper attribution, attempts have been made to measure student engagement [25].

There are several ways to collect data on student engagement—from student self-report surveys to the use of teacher ratings, interviews and focus groups, observational methods, administrative data, and even technology-aided real-time measures [75]. Student self-report surveys appear to help understand the latent cognitive and affective dimensions of engagement that are not readily observable in high school students [76]. Furthermore, the other

methods suffer from either observer or reporter bias [58-61], or issues of validity and reliability [77-79], or may be obtrusive, time-consuming and expensive [11,17,24]. Notably, student self-reported engagement predicts high school completion (or dropouts) significantly better than other easily observable and commonly used behavioural data such as attendance (unexplained absences) or academic achievement data [33,37,38].

An extensive review conducted by comparing and contrasting eleven student self-reported survey measures, appears to provide critical insights into the various attempts (methods and instruments) to attribute, factorise and measure student engagement. A closer look at the survey measures, as listed in Figure 3, indicate differences in purpose. Some surveys explicitly assessed engagement, while others related constructs such as identification with school, motivation, self-regulation, and strategy use as measures of engagement. Some surveys measured general engagement, whereas others, class or subject- specific engagement.

Instrument name	Availability
Attitudes Toward Mathematics Survey (ATM)	Miller, Greene, Montalvo, Ravindran, and Nichols (1996)
Engagement vs. Disaffection with Learning – Student Report (EvsD)	Skinner, Kindermann, and Furrer (2009b) or <a href="http://www.pdx.edu/psy/ellen-skinner-1">www.pdx.edu/psy/ellen-skinner-1</a>
High School Survey of Student Engagement (HSSSE)	<a href="http://www.indiana.edu/~ceep/hssse/">www.indiana.edu/~ceep/hssse/</a>
Identification with School Questionnaire (ISQ)	Voelkl (1996)
Motivated Strategies for Learning Questionnaire (MSLQ)	Pintrich and DeGroot (1990)
Motivation and Engagement Scale (MES)	<a href="http://www.lifelongachievement.com">www.lifelongachievement.com</a>
Research Assessment Package for Schools (RAPS)	<a href="http://irre.org/sites/default/files/publication_pdfs/RAPS_manual_entire_1998.pdf">irre.org/sites/default/files/publication_pdfs/RAPS_manual_entire_1998.pdf</a>
School Engagement Measure (SEM) – MacArthur	Fredricks, Blumenfeld, Friedel, and Paris (2005)
School Engagement Scale/Questionnaire (SEQ)	Available by contacting Dr. Steinberg at Temple University
School Success Profile (SSP)	<a href="http://www.schoolsuccessprofile.org">www.schoolsuccessprofile.org</a>
Student Engagement Instrument (SEI)	Appleton et al. (2006)

Figure 3: List of the eleven student self-surveys analysed [30].

The survey measures also varied on whether and how they have treated disengagement in relation to engagement. For example, while some have represented disengagement as the opposite of engagement [17], others have attributed the former to lack of the latter [28]. Also, the surveys differed on whether they addressed each of the three dimensions of engagement, as seen in

Figure 4. Each of the surveys measured factors of engagement by representing them as subscales. Eight surveys contained factors that seemed to reflect (either by the factor name or the sample items) aspects of behavioural engagement. At the same time, six of them addressed cognitive engagement and eight of them parts of emotional engagement, as outlined in Figure 5.

Instrument	Behavioral	Emotional	Cognitive
<b>Multidimensional self-report instruments</b>			
HSSSE	✓	✓	✓
MES	✓	✓	✓
SEM	✓	✓	✓
<b>Bidimensional student self-report instruments</b>			
ATM	✓	✓	✓
EvsD	✓	✓	
RAPS	✓	✓	
SSP	✓		
SEI		✓	✓
<b>Unidimensional student self-report instruments</b>			
ISQ	✓	✓	✓
MSLQ			
SEQ			

Figure 4: Dimensions of engagement assessed, by survey [30].

	Behavioral	Emotional	Cognitive
Instrument subscales/ subscale name	Behavioral disaffection	Anxiety	Cognitive engagement <sup>f</sup>
	Behavioral engagement <sup>c</sup>	Belonging	Cognitive/intellectual/ academic
	Disengagement	Emotional engagement <sup>f</sup>	Cognitive strategy use
	Persistence <sup>b,c</sup>	Emotional disaffection	Deep cognitive strategy use
	Social/behavioral/ participatory engagement	Failure avoidance	Learning focus
	School Engagement Questionnaire	Affective engagement – family support for learning	Control and relevance of schoolwork
	Trouble avoidance	Affective engagement – peer support for learning	Future aspirations and goals
		Affective engagement – teacher-student relationships	Planning
		Reaction to challenge	Self-regulation <sup>f</sup>
		School engagement	Shallow cognitive strategy use
		Self-belief	Study management
		Valuing <sup>c</sup>	
		Uncertain control	

<sup>b</sup>Disengagement could also be listed under the Emotional engagement column, as they contain items reflecting both  
<sup>c</sup>Persistence is also considered an aspect of Cognitive engagement  
<sup>f</sup>These subscale/scale names were used by more than one instrument

Figure 5: Factors and sub factors by engagement dimension [30].

Additionally, the survey instruments themselves varied; from the Engagement versus Disaffection scale that tested the students' self-system model of engagement [15,18] to the Student Engagement Measure (SEM) that assessed the relationship between context and engagement [34]. Of specific interest in this document are two surveys that had the explicit purpose of improving educational attainment rates (by reducing school dropouts or ensuring school completion) -the Identification with School (ISQ) questionnaire and the Student Engagement Instrument (SEI).

While the ISQ (rooted in the participation-identification model) assessed the extent to which students identified with school and used it as a measure of engagement [22], the SEI measured the latent cognitive and affective dimensions of engagement and used them to expand on the more observable behavioural and

academic indicators that were collected and reported by schools routinely [24]. Significantly, the SEI integrated the leading influencers of engagement (espoused by the three prominent theories underpinning it), such as motivation, autonomy, school, and environment within the scales measuring engagement, thereby treating engagement appropriately as a mediator between its influencers and its outcomes [32]. Also, being a quantitative measure that could be deployed as a measurement tool from time to time, the SEI (just like the other ten measures) recognises the inherent malleability of the engagement construct [44]. Furthermore, each instrument was evaluated for its reliability (its ability to produce similar results across contexts) and validity (the extent to which it measures what it claims to measure), and the SEI instrument scored the highest in reliability scores [55], as seen in Figure 6.

Instrument name	Internal consistency	Test-retest interrater
Attitudes Toward Mathematics Survey (ATM)	.63-.81	-
Engagement vs. Disaffection with Learning (EvsD)	.61-.85	.53 -.68
High School Survey of Student Engagement (HSSSE)	-	-
Identification with School Questionnaire (ISQ)	.54-.84	-
Motivated Strategies for Learning Questionnaire (MSLQ)	.63-.88	-
Motivation and Engagement Scale (MES)	.70-.87	.61-.81
Research Assessment package for Schools (RAPS)	.68-.77	-
School Engagement Measure (SEM)-MacArthur	.55-.86	-
School Engagement Scale/ Questionnaire (SEQ)	.74-.86	-
School Success Profile (SSP)	.66-.82	-
Student Engagement Instrument (SEI)	.72-.92	.60-.62

*Note:* Ranges within cells indicate either differing results for individual subscales, differing results based on age groups, or differing results from various researchers

**Figure 6:** Reliability scores per Survey instrument [30].

The validities of the survey instruments were assessed using different approaches such as construct validity and criterion-related validity [46]. However, the validity results were not compared due to the significant variations in the type and number of factors and items considered in the eleven surveys. The SEI instrument scale used exploratory factor analysis for assessing construct validity on fifty-six items using a socially and culturally diverse sample of 1931 ninth graders and was found to be valid, with the emergence of six subscales (teacher-student relationships, peer support, family support, control and relevance of schoolwork, future aspirations, and extrinsic motivation) [11-14]. Further attempts at refining the SEI instrument using confirmatory factor analysis resulted in five

subscales, dropping extrinsic motivation as a subscale [36]. Over time, the SEI instrument has been refined to improve its validity and reliability further, concurrently with behavioural engagement measures [58], across some teaching and learning contexts [44], and across some geographies [17]. In its current form, the SEI comprises 35 student self-reported items mapped to the cognitive and affective dimensions of engagement [29], as outlined in Figure 7. The latest updates on the SEI instrument's validity are available for reference at <http://checkandconnect.umn.edu/research/engagement.html> [66]. In addition, more details on the SEI are provided as per Appendix (1,2).

Item #	SEI factors and item text
<b>TEACHER-STUDENT RELATIONSHIPS (AFFECTIVE ENGAGEMENT)</b>	
3	My teachers are there for me when I need them.
5	Adults at my school listen to the students.
10	The school rules are fair.
13	Most teachers at my school are interested in me as a person, not just as a student.
16	Overall, my teachers are open and honest with me.
21	Overall, adults at my school treat students fairly.
22	I enjoy talking to the teachers here.
27	I feel safe at school.
31	At my school, teachers care about students.
<b>CONTROL AND RELEVANCE OF SCHOOL WORK (COGNITIVE ENGAGEMENT)</b>	
2	After finishing my schoolwork, I check it over to see if it's correct.
9	Most of what is important to know you learn in school.
15	When I do schoolwork, I check to see whether I understand what I'm doing.
25	When I do well in school, it's because I work hard.
26	The tests in my classes do a good job of measuring what I'm able to do.
28	I feel like I have a say about what happens to me at school.
<b>PEER SUPPORT AT SCHOOL (AFFECTIVE ENGAGEMENT)</b>	
4	Other students here like me the way I am.
6	Other students here care about me.
7	Students at my school are there for me when I need them.
14	Students here respect what I have to say.
23	I enjoy talking to the students here.
24	I have some friends at school.
<b>FUTURE ASPIRATIONS AND GOALS (COGNITIVE ENGAGEMENT)</b>	
8	My education will create many future opportunities for me.
11	Going to school after high school is important.
17	I plan to continue my education following high school.
19	School is important for achieving my future goals.
30	I am hopeful about my future.
<b>FAMILY SUPPORT FOR LEARNING (AFFECTIVE ENGAGEMENT)</b>	
1	My family/guardian(s) are there for me when I need them.
12	When something good happens at school, my family/guardian(s) want to know about it.
20	When I have problems at school, my family/guardian(s) are willing to help me.
29	My family/guardian(s) want me to keep trying when things are tough at school.
<b>INTRINSIC MOTIVATION (COGNITIVE ENGAGEMENT)</b>	
18	I'll learn, but only if the teacher gives me a reward. (Reversed)
32	I'll learn, but only if my family/guardian(s) give me a reward. (Reversed)

Figure 7: Reliability scores per Servey instrument [30].

# Student Engagement Instrument

**MARKING INSTRUCTIONS**

- Use a No. 2 pencil or a blue or black ink pen only.
- Do not use pens with ink that soaks through the paper.
- Make solid marks that fill the response completely.
- Make no stray marks on this form.

CORRECT: ●      INCORRECT: ✗ ⊗ ⊙ ⊖

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Strongly Agree</i>
1. My family/guardian(s) are there for me when I need them.	○	○	○
2. After finishing my schoolwork I check it over to see if it's correct.	○	○	○
3. My teachers are there for me when I need them.	○	○	○
4. Other students here like me the way I am.	○	○	○
5. Adults at my school listen to the students.	○	○	○
6. Other students at school care about me.	○	○	○
7. Students at my school are there for me when I need them.	○	○	○
8. My education will create many future opportunities for me.	○	○	○
9. Most of what is important to know you learn in school.	○	○	○
10. The school rules are fair.	○	○	○
11. Going to school after high school is important.	○	○	○
12. When something good happens at school, my family/guardian(s) want to know about it.	○	○	○
13. Most teachers at my school are interested in me as a person, not just as a student.	○	○	○
14. Students here respect what I have to say.	○	○	○
15. When I do schoolwork I check to see whether I understand what I'm doing.	○	○	○
16. Overall, my teachers are open and honest with me.	○	○	○
17. I plan to continue my education following high school.	○	○	○
18. I'll learn, but only if the teacher gives me a reward.	○	○	○
19. School is important for achieving my future goals.	○	○	○
20. When I have problems at school my family/guardian(s) are willing to help me.	○	○	○

**Please Turn Over**

Appendix 1: SEI Instrument - Scale, Data Tabulation and Analysis (Appleton & Reschly, 2019).

	Strongly Disagree	Disagree	Agree	Strongly Agree
21. Overall, adults at my school treat students fairly.	1	2	3	4
22. I enjoy talking to the teachers here.	1	2	3	4
23. I enjoy talking to the students here.	1	2	3	4
24. I have some friends at school.	1	2	3	4
25. When I do well in school it's because I work hard.	1	2	3	4
26. The tests in my classes do a good job of measuring what I'm able to do.	1	2	3	4
27. I feel safe at school.	1	2	3	4
28. I feel like I have a say about what happens to me at school.	1	2	3	4
29. My family/guardian(s) want me to keep trying when things are tough at school.	1	2	3	4
30. I am hopeful about my future.	1	2	3	4
31. At my school, teachers care about students.	1	2	3	4
32. I'll learn, but only if my family/guardian(s) give me a reward.	1	2	3	4
33. Learning is fun because I get better at something.	1	2	3	4
34. What I'm learning in my classes will be important in my future.	1	2	3	4
35. The grades in my classes do a good job of measuring what I'm able to do.	1	2	3	4

Appendix 2: SEI Instrument - Scale, Data Tabulation and Analysis (Appleton & Reschly, 2019).

Thus, educators could potentially deploy the SEI to quantitatively measure the engagement of their students at the beginning of every school term, use the results to inform and design their interventions, and then measure the efficacy of their interventions by viewing their impact on the engagement scores in the following term [27]. In addition, other qualitative methods such as interviews and focus groups might be deployed to investigate further the individual cases associated with low cognitive and affective engagement scores. Such a cyclical and systematic way of measuring student engagement might aid educators to improve the educational outcomes in their schools.

## Conclusion

In conclusion, there appears to be credible attempts to measure latent psychological constructs such as engagement in a reliable and valid manner through self-report methods. In particular, the SEI integrates the prominent theoretical influences of engagement within its survey instrument, addresses the multidimensional

nature of the engagement construct, and reconciles the overlaps between its influencers, dimensions, and outcomes amicably. Also, the regular use of the SEI can assess students' fluctuating and malleable relationship with education over time. Given its proven track record of reliability and validity across several teaching and learning contexts over time, it promises to be a valuable instrument to measure engagement in a high school context. Moreover, given that the SEI treats engagement as a mediator between its influencers and its outcomes, it aids in understanding the impact of important contexts (influencers) such as self, peers, school, and family on outcomes such as student achievement and attainment [47]. Consequently, the cyclical and systematic use of SEI to measure the malleable concept of engagement over time might facilitate and inform several interventions in high schools to promote it [22,33,48]. After all, "effective classrooms do not just happen. They are led by teachers who deeply understand their craft and the essential nature of the interaction between student, teacher, and context" [59].

**Scoring Procedures**  
 Within each clear box, write the number that corresponds with the rating identified by the student.  
 Use either five or four options depending on the version of the SEI Scale you are using.

5-point scale: Strongly Disagree (1), Disagree (2), Neither Agree Nor Disagree (3), Agree (4), Strongly Agree (5)  
4-point scale: Strongly Disagree (1), Disagree (2), Agree (3), Strongly Agree (4)

Item	TSR	PSS	FSL	CRSW	FG	IM*
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
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19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
<b>Total</b>						

Affective
Cognitive

**SEI Total =**

(Sum all items if at least 15 Affective and 12 Cognitive Items Completed)

\*Intrinsic Motivation (IM) is the only domain where the item responses are reversed.

**Student responses should be re-coded as follows before entering the value in the clear box**

5-point scale:  
 Strongly Agree (5) = 1  
 Agree (4) = 2  
 Disagree (2) = 4  
 Strongly Disagree (1) = 5

4-point scale:  
 Strongly Agree (4) = 1  
 Agree (3) = 2  
 Disagree (2) = 3  
 Strongly Disagree (1) = 4

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Write each column total in the box next to the column title.  
Then divide by the **number of items answered**<sup>1</sup> to calculate a column average.

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**AFFECTIVE (PSYCHOLOGICAL) ENGAGEMENT:**

Teacher-Student Relationships (TSR)  / 9 (or 8 or 7 if fewer answered)

Peer Support at School (PSS)  / 6 (or 5 if fewer answered)

Family Support for Learning (FSL)  / 4 (or 3 if fewer answered)

**COGNITIVE ENGAGEMENT:**

Control and Relevance of School Work (CRSW)  / 9 (or 8 or 7 if fewer answered)

Future Aspirations and Goals (FG)  / 5 (or 4 if fewer answered)

Intrinsic Motivation (IM)  / 2

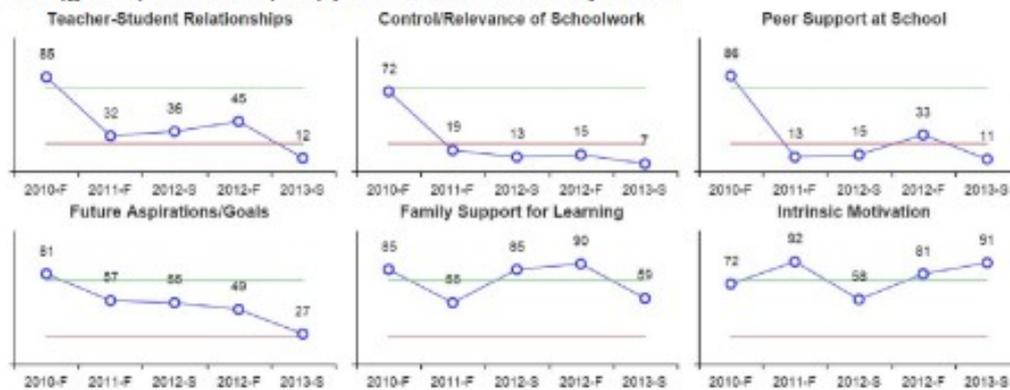
SEI Total (SEI\_Tot)  / 35 (use number answered)

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<sup>1</sup> Domain (and SEI) totals should only be calculated if students have answered at least 75% of the items.

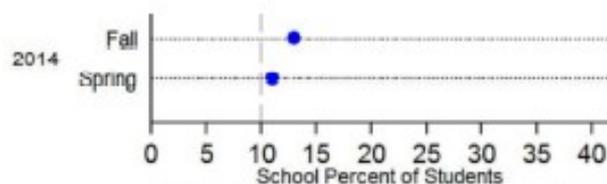
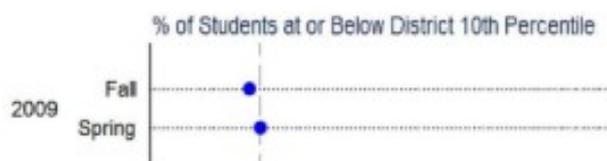
**UNDERSTANDING ENGAGEMENT SCORES:**

- Percentiles by education level (elementary, middle, and high) support practitioners in better understanding a student's engagement score relative to his/her education-level peers. See below a high school student's fall(F) and spring(S) SEI percentiles, across years, with district 75th (green) and 25th (red) percentiles marked by lines.



- Students with SEI scores at the 10th percentile or lower in an education level were found to be absent more frequently, have more disciplinary incidents and suspensions, and to have lower standardized achievement test performance (Appleton, 2012). Therefore, it can be useful to monitor students for SEI scores at the 10th percentile or lower and to examine proportions of 10th percentile or lower students in a school over time. See below for examples (Note: since the 10th percentile is established at the education level, in districts with more than one school at the examined education level, it is possible for more or less than 10% of students at a given school to be at the 10th percentile or lower for their SEI Total score).

	SEI Teacher - Student Relationships	SEI Control and Relevance of Schoolwork	SEI Peer Support at School	SEI Future Aspirations and Goals	SEI Family Support for Learning	SEI Intrinsic Motivation	SEI All Items Mean	SEI All Items Category (Relative to GCPS)
Student 1	4.44	3.44	4.50	4.00	4.50	4.00	4.23	Middle 80%
Student 2	3.44	4.33	4.00	4.20	5.00	2.00	4.11	Middle 80%
Student 3	3.90	4.11	2.20	5.00	4.25	4.00	3.82	Middle 80%
Student 4	1.79	4.00	1.00	4.40	4.50	5.00	3.09	Lowest 10%



Note: District 10th percentile is determined by level (ES, MS, HS), season (fall or spring), and year.

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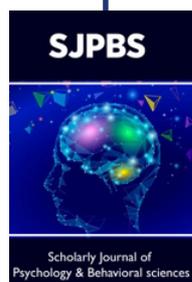
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