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Assessing Student Engagement in Tasks

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Abstract

Research on student engagement in learning and how to boost such engagement has been of interest to both teachers and researchers for many years. Students who are engaged in their classwork not only undertake the work, but also invest a lot of effort, persist with their work, self-regulate their own behavior towards achieving goals, challenge themselves to improve, and enjoy task challenges and learning (Klem & Connell, 2004). However, knowing exactly what it means for students to be *engaged* in classroom tasks and how to measure this complex variable is a challenge in any learning environment. One logical approach which can be taken to defining it is to consider the behavioral, emotional and cognitive engagement of students during tasks (Fredericks, Blumenfeld, & Paris, 2004). A teacher can analyze the actions of students during task-time, their feelings towards the task and the people they undertake it with, as well as the investment of effort they put into completing the task. A big question which follows this is what sources of data can be used to grade and measure these variables. Past research has shown clear preferences for measuring student engagement with observations schemes (Guilloteaux & Dörnyei, 2008; Stroud, 2013b; Volpe, DiPerna, Hintze & Shapiro, 2005), self-reported student surveys and interviews (Fredericks, Blumenfeld, Friedel & Paris, 2005; Skinner, Kidderman & Furrer, 2009) and with experience sampling (Shernoff & Schmidt, 2008; Yair, 2000). Each of these approaches can offer clear advantages and disadvantages for a teacher and careful consideration of the combination and amount of each to be used is a complex matter. Such issues are discussed within this paper and a recommended guideline for teachers and researchers to follow to best measure task engagement for students is offered in conclusion.

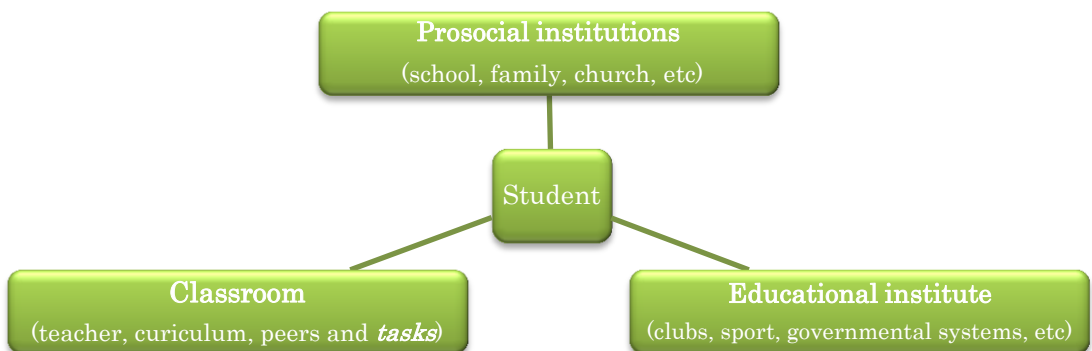
I. Common assumptions about engagement

When teachers consider the *engagement* of their students in both the short and long-term, interpretations of what exactly this word can mean are often varied. An obvious first assumption which can be made in the classroom is *what you see is the truth*. Judgments with regards to student behavior during classwork, based on observations of students during class, are often used in combination with teacher intuition to measure how motivated and engaged students are. However, levels of engagement go much deeper than this. The emotions and cognitive processes taking place within students cannot always be so easily viewed and may even be purposefully hidden from the teacher (Fredericks, Blumenfeld, & Paris, 2004). Much more data collection from different sources is required for teachers to be confident that they are truly assessing student engagement at moments in time and in general across periods of time. Another common assumption is that once a teacher is satisfied that they have found good data sources for collecting information on student engagement, is *engagement is a simple quantifiable measure*. On the contrary, human engagement with their surroundings is an extremely complex issue and one which cannot be made as easily measurable as teachers would sometimes like (Appleton, Christenson & Furlong, 2008). The exact processes taking place in the brain, and the implications these processes have on student learning in the short and long-term can never be completely revealed. All a teacher can do is gather data from as many sources which they judge to be valid for the kind of engagement they are attempting to measure and use methods of measurement which they deem to be valid and reliable. A final assumption made by many teachers is that *students with low engagement will never become engaged in learning*. With this mindset, some teachers may feel that examining when students, who are perhaps not usually very engaged in their work, are most engaged (with regards to the task work given to them, contextual factors at that time and outside influences which may be affecting their engagement) is not very useful information. However, by measuring engagement from class-to-class, a teacher can investigate their own approaches to educating students and provide themselves with feedback which may well help unlock the potential for highly engaged classroom learning environments (Csikszentmihalyi, 1997; Guilloteaux & Dörnyei, 2008; Stroud, 2013a, 2013b). For this to happen, we first need to define what the term *engagement* actually refers to.

II. Defining engagement

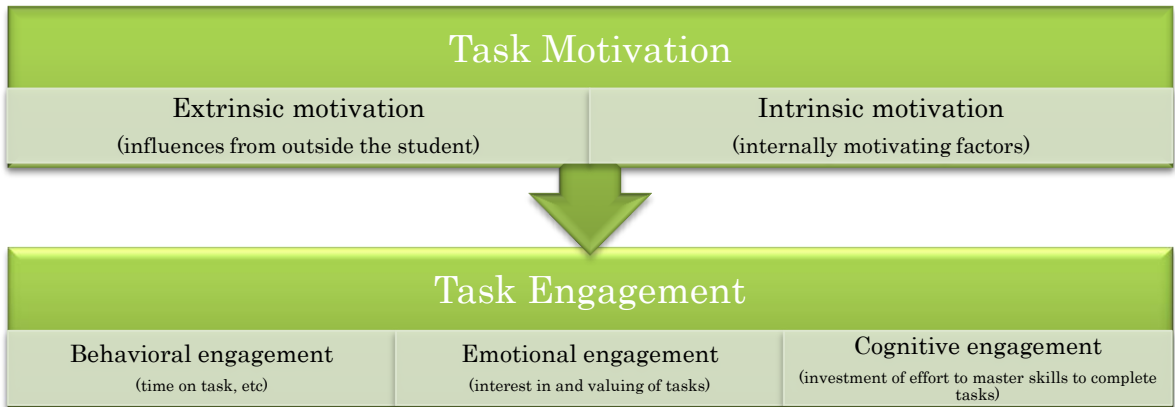
A common misunderstanding in education is that motivation and engagement are one and the same thing. This is not the case. Motivation can be defined as the reasons which exist for someone's actions in terms of the focus, strength, quality and persistence of those actions (Maehr & Meyer, 1997). Engagement on the other hand can be defined as the outward manifestation of that motivation (Skinner, Kindermann, Connell & Wellborn, 2009). Putting it a different way, motivation can be viewed as the resultant psychological state and readiness for action a person finds themselves in due to many internal and external influential sources, whilst engagement is the resulting actions which take place because of this state.

Diagram 1. Dimensions of student engagement



Students exhibit varying levels of engagement at different times with different things in their lives. Skinner and Pitzer (2012) show the multi-level perspective on engagement starting with how students are engaged with prosocial institutions (such as their school, family, and church), different sections of their school itself (clubs, sports and the governmental system), in their classroom (with the teacher, the curriculum and their peers), and down to classroom tasks themselves (see diagram 1 above). Each of these engagements have importance for a student and can strongly influence how they behave, feel and think about things around them.

Diagram 2. Connection between task motivation and task engagement



With regard to student engagement in classroom tasks, there are clear connections which can exist between motivation and engagement, but they cannot be quantified with the same measures. Diagram 2 above can help clarify this complex set-up. For classroom tasks, motivation acts as a *primer* for engagement which can come from many different internal (intrinsic) and external (extrinsic) sources (Vallerand, 1997). Task engagement of students can manifest itself in three different forms. These are *behavioral* (such as the amount of time students spend doing tasks), *emotional* (factors including how interested students are in the task and how much they value it) and *cognitive* (how much investment students put into doing the task in terms of using different learning strategies to complete it for example) engagement (Fredericks, Blumenfeld, & Paris, 2004). Thus, students who become highly engaged in task work (due to a high level of motivation) can express it in a combination of these three ways. Not all of these (and sometimes none of them) can be visible to a teacher and thus using simple observational tactics to determine levels of student engagement in class are clearly inadequate. For example, if a student is sat quietly in a group discussion it is unfair to measure the engagement of that student as zero, just because there is no observable participation taking place. The student may in fact be listening attentively and investing a lot of emotion and effort into understanding the conversation and actually be highly emotionally and cognitively engaged (unknown to the observer). In a very different situation, a student may well be quite visibly speaking a lot during a discussion task, but in fact may not be enjoying it or making any real effort to use any learning strategies to actually complete the task. In this case, the teacher may feel satisfied that the student is highly engaged, but in fact their engagement is just behavioral and arguably not representative of a highly engaged student. Teachers should be aware of these

common misjudgments and remember that students should be engaged as much as possible on all three of the levels mentioned (behaviorally, emotionally and cognitively) for many important reasons which will now be discussed.

III. The importance of engagement

Simply taking part in tasks does not guarantee that students will benefit from the task as much as a teacher might hope. Behavioral engagement involves students actively participating in classwork (as already discussed) and the more a student participates, the more work they can finish within a given time period. However, the *quality* of the engagement the students experience within that time period cannot be confidently measured by a teacher based on the visible actions of the students alone. If a student not only undertakes works given to them (becomes behaviorally engaged), but also experiences positive emotions about the work they undertake and the people they do the work with (becomes emotionally engaged), then other benefits are sure to be present. If the same students were not only undertaking work, enjoying the experience, but also investing in trying as many approaches as necessary to understand and master classwork (becoming cognitively engaged), a teacher can confidently state that the students have become truly *engaged* in tasks. In such a condition, teachers can expect students to not just complete work put before them, but also invest a lot of effort in that work, persist, self-regulate their own behavior towards goals, challenge themselves to exceed, and enjoy the challenges of the work and the learning in general (Klem & Connell, 2004). It is clear how the addition of these elements for students are needed and why engagement, as opposed to simple participation, is essential for learning. The issue with this is how to know when students are or are not responding to classwork in such an engaged manner. Several options for the measurement of students' engagement during tasks will now be discussed.

IV. Measuring behavioral engagement

The first, and perhaps most obvious, element of student engagement for teachers to measure is how behaviorally engaged students are in the tasks given to them. That is to say, how much students actively participate (or not) in their work across time. One clear approach to collecting this data is through the use of observational data. A teacher can watch their students during task-time and assess what they deem as on and off-task behavior (Volpe, DiPerna, Hintze & Shapiro, 2005). This might include things such as students visibly undertaking the task before them and not being distracted or doing other things during the

task-time such as turning around and talking to students outside of their task pair or group (Guilloteaux & Dörnyei, 2008; Stroud, 2013b). By a teacher observing students and making a note at set time intervals about whether those students are judged to be engaged or not (based on whatever criteria is being used to represent behaviorally engaged or disengaged students) it may be possible to quantify the behavioral engagement of a group of students across time for a task (Salvia & Ysseldyke, 2004). This type of approach to measuring behavioral engagement has the advantage of being quite simple in design (simply watching students and checking boxes for exhibited behavior across time) and can provide feedback on the success of a task actively engaging a class or not for a teacher. A teacher for example can sometimes know if a task is being accepted (undertaken with enthusiasm and active participation) or rejected (where students prefer to do nothing, or something other than the task) by students based on the visible actions of students alone (Stroud, 2013a).

However, one big issue with using only observational data for measuring behavioral engagement is that *not all behavioral engagement is visible*. If we consider a student undertaking a missing gap task with a partner (where two students verbally exchange information unavailable to their partner), there are clearly times when the student is behaviorally engaged, but which cannot be observed directly by a teacher. For instance, when they are asked a question by their partner with regards to information on their own worksheet, they may take some time to search for that information with their head down, looking at their sheet. This behavior could be misinterpreted as resting rather than searching. Similarly, they may turn to another student from a different pair and clarify pronunciation of a word. This may be viewed as disengaged behavior by a teacher (not doing the task in front of them), when in actual fact the student was behaviorally engaged.

An additional method of measuring the behavioral engaged for such issues is with post-task surveys for students. Asking students directly about what they were doing during the task-time (especially with regards to unobservable actions or those which an observer would have trouble analyzing) can reveal data unavailable to someone only watching students do tasks. Additionally, a greater volume of data can be collected with surveys, as entire classes of students can be asked to complete one after undertaking tasks. With an observation scheme however, unless classes are recorded and the teacher watches the data again at a later date (which can also be very time consuming) the number of students a teacher is capable of observing in detail is limited. Additionally, observation schemes can be viewed as quite inferential, as they really do rely on a well-trained observer (who can confidently classify actions by students to represent true

behavioral engagement or disengagement).

Surveys however, can only scratch the surface of what students did during tasks. For a more in-depth analysis of actions, interviews are needed. By sitting with and asking students directly about their actions post-task, a teacher can reveal more about the actions taken by a student, as well as the possible reasons for those actions. Of course, by investing such time to sit with students, the number of students who can be interviewed will be limited (compared to surveys). Additionally, a teacher must consider how many student interviews would be adequate for them to feel satisfied for those interviews to closely represent the behavioral engagement of an entire class.

A final consideration with regards to self-reported data such as post-task surveys and interviews with students is the reliability of such data. A teacher needs to be aware that asking students directly about their actions during a task (when they perhaps know that the teacher was expecting them to stay on-task the entire time and not do other things) can be questioned as a reliable method for measuring engagement (Garcia & Pintrich, 1996). A student may be hesitant to admit that they were not undertaking the task given to them and perhaps not be honest in answering questions directly from their teacher about such actions. Also, depending on how long the tasks were, students may not recall all of their actions post-task. Therefore, what is needed for a clear view of behavioral engagement during task-time is a well thought-out combination of both observational and self-reported measures to represent student actions which take place.

V. Measuring emotional engagement

It is of high importance for a teacher to measure not only the actions of their students in classroom tasks (behavioral engagement), but also the feelings of those students towards doing the task, the people with whom they do it, and others nearby (emotional engagement). Although student emotions can sometimes be visible during tasks (in the form of laughter, or arguing with others for example), it is clear that a system of measurement for emotional engagement of students needs to go beyond simple observational data. Students can be very good at hiding their emotions from others, which makes the use of other measurements (such as self-reported data) essential for measuring emotional engagement more accurately (Skinner, Marchand, Furrer & Kindermann, 2008).

The most common approach to measuring emotional engagement for students is with surveys. Most surveys used in the past have been used to measure the more general, long-term emotional engagement of students with their education. Examples are responses to statements such as "I am interested in the work at

school" in the School Engagement Measure (SEM) survey (Fredericks, Blumenfeld, Friedel & Paris, 2005), and "when we work on something in class, I feel discouraged" in the Engagement vs. Disaffection with Learning (EvsD) Student Report (Skinner, Kidderman & Furrer, 2009). With regards to emotional engagement in specific tasks undertaken by students, survey questions should be directly more towards the work just performed by the students (asking more about things such as how much they enjoyed the work, how interesting it was for them, how much pride it gave them, or other positive or negative feelings it created). By asking such questions to students, a teacher can go beyond visible engagement and gather more information about how students feel connected or disconnected to their class work and the people they do it with.

Emotional engagement in tasks can be measured even further with the use of post-task interviews with students. As already mentioned with behavioral engagement, taking the time to sit with students and gather more detail about their engagement in work can be much more fruitful than just observing them, or collecting survey answers. With regards to the emotions of students doing classroom tasks, interview data could be an essential measure of looking into how students are feeling about task work. A teacher would need to invest this time to ask their students in detail about their feelings towards their work on a one-to-one basis, or perhaps never hear from a student about their true feelings with regards to classwork and others around them. However, one-to-one interviews done by a teacher with a handful of students will most likely be time consuming and a teacher must consider who to interview, as well as when and for how long to interview them. Interviews also require a teacher to be skilled at interviewing techniques (so as not to be biased or leading in answers for example), and well-trained at interpreting the responses they get from students (McCaslin & Good, 1996). If a teacher relies too heavily on a small set of badly designed, biased interviews for example, they may misinterpret the emotional engagement of their classes for tasks they are given. As with behavioral engagement, what is needed is an appropriate balance of observational, survey and interview data for students, depending on the students at hand and the interpretation of emotional engagement of the teacher.

VI. Measuring cognitive engagement

A third student engagement type for a teacher to consider for task work in class is cognitive engagement. This refers to the psychological decisions and processes undertaken by students during task work and is unsurprisingly very difficult to both define and measure. Some learning strategy usages which

represent cognitive engagement can be observed by a teacher, including self-monitoring, exchanging ideas with other students, giving directions, justifying responses, relating tasks to prior knowledge, and clarifying (Helme & Clarke, 2001; Lee and Brophy, 1996). However, this is a highly inferential way to collect data on what cognition is occurring inside a student's head and should not be trusted as a single data collection method for cognitive engagement during tasks (Appleton, Christenson, Kim & Reschly, 2006). As previously discussed for behavioral and emotional engagement, a careful combination of observational, survey and interview data is required to obtain the most reliable and valid measurement of the cognitive engagement of students in task work. By viewing student usages of learning strategies to undertake and master task work, and then asking in-depth post-task questions regarding the thinking and approaches undertaken during the task, a teacher can obtain a clearer view of cognitive engagement. Students who try varied approaches to completing a task *and go the extra mile* to master the skills required to complete the task can be said to be highly cognitively engaged.

One issue with asking students about their cognitive engagement post-task is the difficulty for students to recall exactly what they were thinking or trying to do across time after the task is finished (especially if the task-time was very long). One measurement system used to attempt to overcome this is Experience Sampling (ESM). In the past, students have been given an alarm for example, and every time the alarm sounds the students writes down their exact actions, emotions or cognitive processes at that time (Shernoff & Schmidt, 2008; Yair, 2000). In terms of collecting data on general engagement for students in the long-term this can be very useful data indeed. Catching students in the moment (rather than asking them about these elements of engagement long after the event in question) can obtain more reliable data which is easier for students to record at the time it is actually happening. With regards to momentary engagement in classroom tasks, asking students to record their cognitive processes as they are happening (perhaps writing them down every few minutes) would be a more suitable approach to measuring and collecting data on the cognitive processes of students across task-time. One concern with this of course is the consumption of actual time on task for students by doing this. A teacher who wishes to collect such data must consider how long students will spend recording it and be careful not to take the students too far away from doing the actual task work given to them. Carefully combining ESM with observation schemes, surveys and interviews is key for teachers to gather reliable and valid data on cognitive engagement, without creating too much work load for themselves or their students during tasks.

VII. The importance of engagement

Student engagement in classroom tasks is clearly a complex variable which can prove to be difficult to both define and measure for teachers. However, by teachers taking the time to define what will be perceived to be positive engagement and also how to judge whether or not such engagement is present during task-time can give teachers a greater chance of understanding when their students are (or are not) engaged in learning. By doing so, teachers will gain the ability to measure student reactions to factors such as varying task-design elements, different learning environments and set-ups, and teaching strategies employed.

Table 1. Defining, measuring and using student task engagement data.

| | | Starting questions | Recommendations |
|--------|------------------------|---|---|
| Step 1 | Define engagement | What variables do you consider to represent engaged and disengaged behavior for your students during tasks? What different types of engagement do you want to measure with your students? | Focus upon what actions, feelings and thinking patterns you want students to undertake during tasks and what outcome you wish to see afterwards. |
| Step 2 | Consider the resources | How much time do you want you and your students spending on measuring engagement before, during and after tasks? Which measures will be realistic for you considering your available classroom resources and time? | Consider how much valid and reliable data you can collect with time spent on measuring engagement. Think about the reality of your classroom set-up, time available and other resources for collecting data such as video equipment or other technology. |
| Step 3 | Create the measures | Which combination of approaches to data collection are most suitable for you to undertake? | Plan different combinations of observation schemes, surveys, interviews and experience sampling until you feel you have appropriately reliable and valid data with a realistic work load for yourself and your students. |
| Step 4 | Pilot the scheme | Which of your students are suitable for you to test your initial measurement scheme for engagement? | Choose a class or two or your own and run your measurement scheme with them for some different tasks you give them. |

| | | | |
|--------|---|---|--|
| Step 5 | Assess and make any necessary adjustments | <p>Do you feel that you measured engagement as you defined it in step 1?</p> <p>Was the workload and time used to measure engagement as you had hoped in step 2?</p> <p>Do you feel that the measures you used produced enough reliable and valid data for you?</p> | <p>Think about whether your original definition of engagement matches with what you now feel it should be.</p> <p>Note down any changes to your opinion. Also, consider any changes you wish to make to your measurements in terms of type (observational or self-reported) time spent on each (more, the same or less time for each) and how many students you collect data from for each (perhaps increase or decrease).</p> |
| Step 6 | Re-run and analyze the scheme | Do you feel your adjustments to the pilot improved your measurement scheme? | Repeat step 5 as necessary until you are comfortable with your overall measurement of engagement as you now define it. |
| Step 7 | Utilize the data | <p>Who do you wish to share your measurements with?</p> <p>How can your data be used to help improve student learning?</p> | Consider sharing your measurement scheme data with students, parents and the educational institute to help give an analysis of engagement and help improve it in the future. |

Having students who are highly engaged in learning will not only be actively participating during tasks, but have positive emotions towards classwork and their learning environment, as well as be investing themselves psychologically in mastering skills to complete tasks put before them. In order for teachers to measure this engagement guidance is required (in addition to teachers only relying on their intuition). Table 1 above offers a simple seven-step outline for teachers of any subject to define, measure and act upon engagement levels of students in classroom tasks. By taking such steps a teacher can move closer to understanding what engagement is, how to measure it, and perhaps which factors related to tasks are of most significance for engaging their students. This is an important step that teachers may currently be lacking and one which should be taken to help move towards more engaged learning environments for students in classrooms.

VIII. References

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