Learner Classroom Engagement: Definition, Measurement and Data Usage

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Abstract
Ensuring that learners are engaged is of high priority in any learning environment. Signs of such *engagement* include learners who are investing a lot of effort, remaining highly focused, persisting and enjoying challenges. Despite this, learners put into autonomous learning situations (undertaking work away from an instructor) may exhibit signs of *disengagement*, such as not doing the work, becoming distracted, or even distracting others. Identifying when and with who such issues may be occurring during learning can be crucial for instructors if they are to make relevant changes in order to promote higher levels of classroom engagement. Feedback from observation schemes, as well as learner surveys and interviews are the most commonly used approaches to identifying engagement problems. An experiment involving a mixed-method approach to analysing the engagement of 10 Japanese university students in English classroom discussions was undertaken and results discussed. Results generally showed that combining weekly observational recordings with student surveys and interviews revealed a satisfactory overall picture of the engagement of the students during discussions (in terms of behavior, feelings towards work undertaken and cognitive processes) and uncovered some potential reasons for low engagement. However, each of the three data collection methods came with clear issues themselves (such as reliability, validity and consumption of time) and require adaptation to better suit the situational needs of different teachers and students.

Keywords: Engagement, Motivation, Classroom Learning, Discussion Tasks

Defining learner engagement

A good starting point is to explain what 'engagement' actually refers to for learners. As Klem and Connell (2004) state, learners who are engaged will invest a lot of effort in work, enjoy the challenges put before them and persist rather than giving up quickly or easily. This makes it clear that engaged students will not only exhibit actions which demonstrate involvement in tasks (visible behaviors such as discussing and completing classroom tasks for example), but will also enjoy the work put before them, as well as apply varying cognitive processes in an effort to complete and master that work. These three elements of engagement are defined by Fredericks, Blumenfeld and Paris (2004) as *behavioral* (positive actions towards completing work), *emotional* (positive feelings towards the work) and *cognitive* (making efforts to complete and master the work) engagement. All three are clearly important for learners to be said to be truly engaged and need to be assessed during learning for classes. It can be confidently stated that learners who become highly engaged in these ways will be more likely to reach a state of 'flow', during which they will have intense focus, enjoyment, engagement with a task, and a lack of self-consciousness (Csikszentmihalyi, 1997). This is believed to lead to better performance from learners due to repetition, motivation, exploration, satisfaction, more time on task and more willingness to take risks. (Egbert, 2003).

Several common issues exist for learners which may prevent them from becoming engaged in such a manner. Problems with confidence and low interest in the work at hand, for example, can lead to low levels of willingness to communicate amongst learners during class and undesirable behaviors (MacIntyre, Clément, Dörnyei & Noels, 1998). These may include learners becoming bored, distracted, or even disruptive to the engagement of others (Carless, 2007) and decrease the chances of learners reaching a state of flow. Identifying when situations such as these may be occurring is of high importance for ensuring that learners are progressing as they should be in class. However, accurately and reliably measuring how engaged students are is a complex and questionable issue, which will now be discussed.

Classroom engagement measurement challenges

Due to the benefits of high levels of learner classroom engagement mentioned above, exploring how to combine different available measures to appropriately assess how engaged learners are has become a large area of educational research in recent years (Darr, 2012; Fredericks & McColskey, 2012; Stroud, 2015). The main approaches presently discussed consist mainly of:

• *Teacher intuition* - a simple and fast approach to gathering data which should not be overlooked as a reliable way of gaining an overall sense of how engaged learners are. Any experienced teacher will know that first impressions about how learners are reacting to the work put before them (through watching them work) can often by quite accurate. However, data gathered through this method alone is rather limited in terms of exact actions, feelings and though processes which learners might undertake.

• *Observation schemes* - one quick and simple approach to measuring engagement is for teachers to watch students and score their engagement levels in

real-time based upon pre-determined observable markers, such as when they are deemed to be focused on their work or not (Guilloteaux & Dörnyei, 2008; Stroud, 2013; Volpe, DiPerna, Hintze & Shapiro, 2005). However, this is not a very detailed method for collecting data and may not tell us much about students' non-observable behavior, emotions or cognitive processes during work (important parts of engagement discussed earlier). If more detail about what students did, felt or thought during work is required than this then recordings of student spoken or written work can be analyzed in more depth. However, this requires more of a work and time commitment from teachers, as well as other experiment related considerations (such as ethical guidelines and possible atypical behavior of students due to recording them).

• *Learner surveys* - these can act as an extremely fast approach to collecting and analyzing large amounts of data on engagement from learners (especially if they are administered, completed, gathered and processed electronically). Examples of recently used surveys in an educational setting include the *School Engagement Measure (SEM) survey* (Fredericks, Blumenfeld, Friedel & Paris, 2005) and *High School Survey of Student Engagement* (HSSSE) (available at http://ceep.indiana.edu/hssse/index.html). Asking learners directly about their actions and feelings during classwork has the potential to uncover data which observation schemes cannot always tell a teacher. However, surveys in any research field can be questioned in terms of validity and reliability, and questions students are asked within such a survey must be carefully worded, ordered and administered in an appropriate manner, as to ensure students will give honest answers which do in fact indicate levels of engagement as they are intended to be examined.

• *Learner interviews* - asking learners directly about classwork can be a fruitful way of gathering data about how engaged or not they may be in their learning. Interviews may work particularly well to examine questions which may arise from observation or survey data. For instance, if a teacher was to discover that students did not become very engaged in certain tasks or during certain parts of a class, then interviews could attempt to find out why this may have been by directly asking learners exhibiting such behavior about it. Issues with using interviewing to gather data on engagement include the skills required to interview students in order to gather valid data and the skills needed to interpret answers given (determining what questions to ask, how to ask them and what answers actually mean in terms of engagement). Additionally, interviews may be time-consuming and certainly will not be as quick as surveys for example in terms of gathering large numbers of responses.

• *Experiential sampling* - an alternative method to examining engagement for learners at certain times during class involves asking them to answer questions about their actions, emotions and cognitive processes at different times (Yair, 2000). At set time intervals, or when an alarm goes off in the classroom, learners can explain exactly what it is they were doing, thinking, or feeling at that exact time. This is an effective way to catch learners in the moment, so that their engagement at that time can be recorded, rather than asking them at a later time (when they may not be able to recall such data). However, collecting data in such a way may well be time consuming and potentially counter-productive for learning by distracting students from their actual work.

Using an appropriate combination of the above methods to collecting reliable and valid data on student classroom engagement is a great challenge in educational settings. Deciding which approaches to use would depend on several factors such as how engagement has been defined, how detailed the data required is, and the amount of time available to the teacher and learners for gathering data. If learners are simply required to talk to one another and the content of such speech is not seen as crucial to making a judgement on the level of engagement achieved, then a simply observation scheme (such as awarding points for when students are and are not judged to be engaged across time increments for task work) supported by a survey may be enough to satisfy a teacher as to whether a class is adequately engaged in work or not. However, if the precise content of work on an individual basis is required for example, then a more detailed examination (most likely involving recordings and one-to-one interviews) may be required.

Utilizing learner engagement data

Once a teacher is satisfied that enough data has been collected, it is then important to decide how to interpret and use that data to better the learning undertaken by the same learners in the future. Several ways in which such data might be used are discussed below:

• *Assessing and helping individual learners* - understanding when particular learners in a class may need assistance can be revealed by measuring classroom engagement. If possible reasons as to why such learners are exhibiting low levels of engagement are understood by a teacher, adaptations to better suit the personal needs of individuals can be made in terms of differing learning styles, ability levels, or mode of output for work for example.

• *Assessing and altering syllabi* - if general engagement issues are discovered from data collected for an entire class of learners (such as low levels of engagement during certain types of tasks for example), then changes to the design of coursework and syllabi which may improve engagement levels can be made. Furthermore, if common reasons amongst the learners for engagement issues can be identified, then the effects of alterations in the design of work undertaken can be examined by a teacher in order to further increase learner engagement in the future.

• *Continual feedback for a teacher* - Once changes have been made for individuals or whole classes of learners, a teacher can keep a record of engagement figures using the same scales they have adopted for measuring it across time. Positive (or negative) changes recorded in engagement (as the teacher is measuring it) due to alterations made can be learnt from and used to better design coursework to nurture classroom engagement in the future.

Experiment

An experiment was devised to examine the reliability of using a combination of the recently documented and researched data collection methods discussed above for assessing learner classroom engagement. Second language pair discussion tasks were selected as the classwork to examine, with a combination of an observation scheme, learner surveys and learner interviews to assess engagement.

Experiential sampling was not used, as it was seen as impractical in terms of time taken to do it during a discussion and the distraction it may cause for learners. The exact research question addressed in the experiment was:

Can learner classroom engagement issues for pair discussion tasks be confidently identified and explained using the triangulation of data between a) an observation scheme, b) learner surveys and c) learner interviews?

Participants

10 low-level Japanese university students with an average TOIEC score of 441 (standard deviation of 109) undertook weekly classroom-based pair discussions during an English communication course, which were recorded and analyzed for levels of engagement. Students met every week for 90 minutes for eight weeks, during which they undertook their discussions at the beginning of each class.

Data collection

Data regarding classroom engagement for the ten students was collected and triangulated using the following three methods:

1.   Observation scheme

Audio recordings of student pair discussions were collected each week using microphones placed upon students' desks. Students were desensitized to the recording equipment several weeks prior to the experiment, so as to avoid any atypical behavior due to direct observation and recording. The recordings were transcribed and analysed after collection and the levels of engagement of students within the experimental discussions measured using the measurements below (higher values for each were judged by the researcher to represent higher levels of behavioral, emotional and cognitive engagement within a discussion):

•   Total speaking turns taken (at least one clause in length)
•   Total words spoken
•   Mean words per speaking turn
•   Total opinions given (including agreements and disagreements)
•   Total supporting reasons given
•   Total 'requesting' turns taken (including questions asked, clarification check, and requests for help)
•   Total 'helping' turns taken (including paraphrases attempted and help given for a partner's speech)

2.   Learner surveys

A survey was distributed in Japanese to the students after all eight of the discussions had been completed, in order to gather self-reported data for classroom engagement. Eighteen items were used to analyse student *general engagement* (feelings towards practicing and using English with people at the university), *discussion engagement* (using English to undertake the classroom discussion with their partner) and *out-of-discussion engagement* (feelings towards becoming engaged in actions outside of the

discussions themselves to improve at doing them). Items were written in a mixed order, reversed in polarity in places, and scored between zero and three points. Details of the survey can be seen in the appendices.

3. Learner interviews

Following the observation scheme and survey results, four specific students were selected for interviewing (based on pair discussion engagement issues identified by the researcher) to further explore potential reasons for such issues. Interviews lasted approximately five minutes and the interviewees were simply asked *"what would make it easier for you to speak a lot in the discussions?"*.

Results and discussion

a. Observation scheme

Following the recording, transcription and analysis of the eight weekly discussions for each of the five pairs of students (totalling 40 eight-minute pair discussions), the final observation results were calculated and are shown in Table 1.

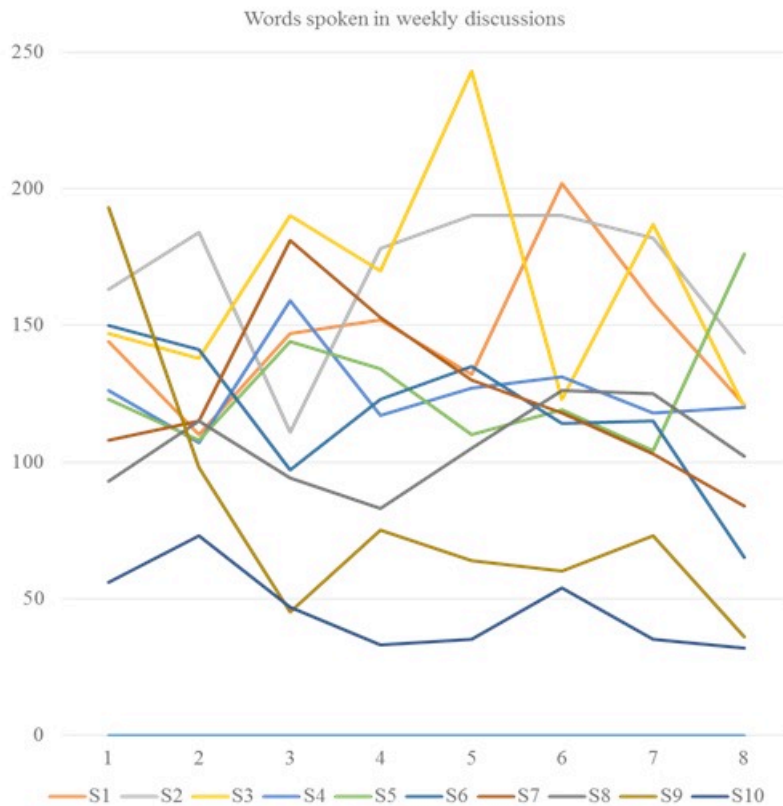| Student	Word count	Number of turns	Words per turn	Opinion / Agree / Disagree	Supporting reason	Request act (ask question / clarify / request help)	Help act (paraphrase / give help)
S1	145.8	14.3	10.2	5.9	3.6	5.1	0.3
S2	167.3	13.7	12.2	5.1	3.7	6.1	0.5
S3	164.8	7.7	21.4	3.3	7.3	4.4	0.5
S4	125.6	6.6	19.0	4.2	5.7	**0.6**	0.4
S5	127.3	12.5	10.2	5.4	3.5	4.6	0.3
S6	117.5	11.5	10.2	4.8	4.5	**2.4**	0.8
S7	124.0	11.1	11.2	3.2	2.9	5.7	1.2
S8	105.4	9.7	10.9	2.6	3.8	3.7	1.7
S9	**80.5**	**5.6**	14.4	**1.7**	**2.0**	**2.3**	0.3
S10	**45.6**	**5.7**	8.0	**1.1**	**2.3**	**2.4**	**0.0**
AVERAGE:	**120.4**	9.8	12.8	3.7	**3.9**	**3.7**	**0.6**

Table 1. Observation scheme figures for each student across eight discussions.

Several figures for engagement in Table 1 were considered to be potential issues by the teacher (set in bold in the table). In terms of overall averages, the teacher felt that although the students took adequate speaking turns (an average of almost ten each) and gave a sufficient number of different opinions each (averaging 3.73), there were not enough words spoken on average by each student in the eight minutes assigned (only 120.36 words on average per student). This low number of spoken words was felt by the teacher to be possibly due to the shortage of questions students asked their partner (averaging only 3.73 each), the low number of supporting reasons given to make turns longer (3.93 average), and the low amount of 'helping' between students to sustain speaking (averaging 0.6 paraphrases or helping turns per student).

These may need addressing in teaching for the students, so as to boost the number of words they will say in discussions in the future.

In terms of individual data, the engagement values of most concern to the teacher were for students 9 and 10, with both students exhibiting what were considered by the teacher to be low average figures for almost every engagement measure used. These students may need particular attention from the teacher in order to identify and tackle any issues which may be resulting in such low engagement compared to classmates.
Weekly values for the total words spoken in discussions were also examined to attempt to see any patterns in engagement issues across the eight weeks for the individual students (see Graph 1). Several of the students appeared to speak less often as time progressed across the eight weeks (especially students 6, 7, 9 and 10) and this decrease in engagement in discussions over time would need addressing from the teacher. However, reasons for such issues for the students would need further examination and results for the individual surveys and interviews performed will now be used to do so.

Graph 1. Words spoken each week by students across eight weeks of discussions.

b.   Learner surveys

Total student scores calculated for each of the three engagement types measured with the survey (general, discussion and out of discussion) are shown in Table 2. In terms of the average scores for the class, the data was viewed as quite uninformative by the teacher. Each engagement measure averaged around about fifty-percent of the maximum, not giving any clear indication of high or low self-reported engagement for the students. However, individual scores revealed more useful data.

	General engagement	Discussion engagement	Out-of-discussion engagement	Total score
S1	8	10	10	28
S2	11	7	7	25
S3	7	7	8	22
S4	9	8	11	28
S5	10	8	8	26
S6	8	6	9	23
S7	5	4	3	12
S8	11	9	10	30
S9	10	5	11	26
S10	6	9	9	24
AVER	8.5	7.3	8.6	24.4

Table 2. Learner engagement survey results.

Scores of six or less for each student (one-third of the maximum available) were considered to be of concern by the teacher and are set in bold in the table. Matching the observational data above, the same four students were found to show issues for engagement (students 6, 7, 9 and 10 again). Student 6 and 9 reported having low engagement for the actual discussions themselves (discussion engagement), student 7 reported having low engagement for all three measures, and student 10 reported having low general engagement at the university (general engagement). This data takes us a little closer to understanding why each student might have not spoken so much in discussions (and spoke less across time during each week's discussion), but interviews were also required to further examine reasons for such issues.

c.   Learner interviews

Following on from the findings of the observation scheme and surveys above, four students were interviewed. All four of the students were deemed by the teacher to have shown significantly low levels of classroom engagement and an undesirable decrease in engagement (in the form of words spoken per discussion) across time. In order to examine why this may have happened, each student was interviewed for approximately five minutes using an opening question of *"What would make it easier for you to speak a lot in the discussions?"*. The main points expressed by each of the students are summarized in Table 3.

Student	Preference to improve personal engagement in future classroom discussion tasks
6	Some kind of scoring for participation or English used; Competition between the partners for performing in the discussion
7	Having more time to plan for the discussion; Being able to choose more interesting topics
9	Being able to choose topics which the student is more familiar with and has more interest in
10	Having more time to plan what to say in the discussion

Table 3. Summary of learner interview responses.

The interviews served well as a follow-up to the observation scheme and surveys, revealing more about some specific reasons for low engagement for the four students during their discussions. Having more time to plan and discussion topics which are more familiar or interesting were explained as factors which may improve engagement by two of the students. Additionally, using some kind of scoring or competition between partners was reported by student 6 as a way to help them speak more in discussions in the future. Interviewing the students directly was an effective way of finding relevant task design issues which may increase individual and overall classroom engagement in the future. The effects of student preferences to discussion task design stated by the students (see Table 3) are not examined in this paper, but would make very interesting areas of further research into examining how engagement data collected can actually be used to improve engagement or not.

Conclusions

This paper examined the usefulness and practicality of using a mixed-method approach to analysing the classroom engagement of learners undertaking discussion tasks with a partner. It was shown in the results that using a combination of an observation scheme, learner surveys and learner interviews can reveal some specific data about the actions, feelings and cognitive processes which learners may undertake during class.

The observation scheme used was successful in showing how much students participated orally in their discussions (how many words they said each week) and what kinds of cognitively challenging contributions they made during that time (asking questions or giving help to their partner for example). This was used to determine which of the students may be experiencing issues with engagement in their work. Although this is valuable data for a teacher who is assessing the engagement of students in classroom tasks, this approach to data collection was very time consuming and may not always be practical. If time is available to a teacher to record, transcript and analyse students in this way then such observations will be a very fruitful method for data collection. However, teachers short of time may need to simplify such a method, by using a less detailed 'checkbox' approach to observing students in real-time for example (by watching students and awarding points across time increments for pre-determined measures of behavior such as paying attention to their task).

The survey used in the experiment was rather more limited than the observational data for revealing engagement issues amongst learners, with students generally giving quite average scores for each scale. Teachers need to remain aware that self-reported data collection from students such as this will not always reveal useful data and that survey responses will need careful interpretation. However, the students in the experiment who scored much lower on the engagement scales used were identified using this very quick method of data collection and were then approached for interviews to discover what their issues leading to low-levels of engagement may be. The interviews of these students were a little more time consuming than the surveys (something for teachers to also consider when deciding how many students to interview), but were very useful in revealing some key task design factors to address in order to try an increase student engagement in the future.

On the whole, the mixed-method approach adopted was very useful for establishing which students and for what reasons engagement issues may be present. Such an approach should be adopted by teachers who wish to analyse the effectiveness of their own teaching to create highly engaged classroom learning environments, whilst considering resources available such as time and classroom equipment to do so.

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Appendices

Engagement survey

Variable	Item	Polarity	How true are the following for you? (0 = untrue, 1= not very true, 2= true, 3= very true)
GENERAL	TASK PARTNER	P	I enjoy talking in English with my discussion activity partner(s) in class.
DISCUSSION	DISCUSSIONS	P	I enjoy discussing things in English in class.
OUT OF DISCUSS.	ASK TEACHER 1	P	Before and after discussions, I often ask the teacher for help with difficult discussion points.
GENERAL	FOREIGN STUDENTS	P	If I see a foreigner on campus, I would like to speak in English with them.
DISCUSSION	ATTEND	N	I would rather avoid going to classes with discussions.
OUT OF DISCUSS.	THINKING 1	N	Trying to figure out how to get better at discussions from week-to-
GENERAL	CLASSMATES	N	I dislike speaking English with other class members.
DISCUSSION	STRENGTHS	P	I would like to understand my discussion strengths and weaknesses
OUT OF DISCUSS.	MORE DISCUSS. 1	N	It is very unlikely I will talk more about discussion content/skills
GENERAL	FOREIGN STAFF	P	I want to try to speak English with more foreigners in the English
DISCUSSION	OPINIONS	N	I would like to avoid explaining my personal opinions to others in
OUT OF DISCUSS.	THINKING 2	P	I will often think about how to improve my discussion skills next time after a discussion.
GENERAL	TEACHER	N	I avoid speaking to my English teacher in English.
DISCUSSION	OWN GOALS	P	I would like to be able to create and manage my own discussion skills targets.
OUT OF DISCUSS.	MORE DISCUSS. 2	P	After I finish a discussion with a partner, I always try to talk about how well we did with them.
GENERAL	FOREIGNERS	N	When I see a foreigner somewhere in Japan, I would like to avoid speaking English with them.
DISCUSSION	IMPROVING	N	I think improving my discussion skills is too much effort.
OUT OF DISCUSS.	ASK TEACHER 2	N	If something is difficult in a discussion, I will stay quiet rather than ask the teacher how to do it better next time.

(Note: the grey areas in the table were not shown to the students)