

Constructivism and Differentiation: Research and Practical Strategies for Assessment

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"Oh, I'd love that Mrs. Grunberger. Can I partner with Gila?"

"Gila, is that okay with you?"

"Sure, when we interview my grandmother about her experiences during the Shoah, Chaya can help takes notes and ask questions."

Mrs. Shayna Grunberger, an eighth grade teacher at, a co-ed modern Orthodox day school in a major city in the US, has just completed a unit on rescue during the Shoah. The class read Johanna Reiss' award-winning novel, The Upstairs Room. Very authentic, the novel stirred Mrs. Grunberger's eighth graders, especially the girls. The novel tells of the trials and tribulations of a Dutch Jewish family which is hunted by the Nazis. Annie de Leeuw, the youngest of the three daughters, and her sister Sini must leave their life in the town of Winterwijk, Holland, and go into hiding. Eventually, they are hidden by a Gentile family, the Oostervelds, who live on a farm. The girls remain with the family for two years until Holland is liberated. During the time, the family becomes attached to the girls, and the girls come to think of the Oosterveld's house as home. Although protected, the girls must live in secrecy, unable to go

outside and lead a normal life.

Mrs. Grunberger can be heard during one session engage her students with a series of thought provoking questions:

"What does a hero mean to you?"

"What do you imagine life would be like if you had to hide, as did Annie, for over two years?"

"What qualities did the Oosterveld family have to possess in order to risk their lives to rescue the sisters?"

Mrs. Grunberger also encouraged her eighth graders with a variety of active learning engagements, including cooperative learning (e.g., forming groups wherein each group member conducted additional research on a particular aspects of the Shoah related to rescue, then later having the group come together to put the 'research puzzle' together as one big project), oral testimonies (e.g., like Gila and Chaya above, interviewing a survivor who had been rescued), and art projects (e.g., encouraging artistically minded students to create pieces of art, i.e., watercolors, oil paintings, pen and pencil drawings, charcoal drawings, sculptures, mobiles, etc., depicting life in hiding during the Shoah).

In an effort to further the authentic learning experiences of her students, Mrs. Grunberger took her class to the Museum of Jewish Heritage in Battery Park, New York City. She even inquired about the feasibility of taking some of her students on a summer excursion to Europe, sponsored by the Museum, to further explore aspects of rescue during the Shoah. Mrs. Grunberger culminates her unit by encouraging her students to come up with practical connections between lessons gleaned from study about rescue during the Shoah to their every day experiences. Students construct meaning in some of these varied ways: creating character education projects, exploring rescue efforts in other genocides, initiating a letter writing campaign to political leaders, etc.

Mrs. Grunberger clearly employed constructivist pedagogies while considering how she might differentiate various learning activities as she encouraged active student engagement with the material from her unit on rescue during the Holocaust. Employing such pedagogical approaches is commonplace in Mrs. Grunberger's classroom, as they are, we hope, in many similar classrooms in Jewish day schools everywhere. But why are these active learning engagements employed and what impact do they have on student learning and achievement? Do such learning experiences via the use of special hands-on projects produce higher achievements levels and deeper learning outcomes than do more traditional approaches (e.g., having students write compositions and essays, listen to lectures, or view a video on rescue)? How can the classroom teacher assess active learning?

This article examines rationales for the use of constructivist practices and differentiating instruction in the Jewish day school classroom as cutting edge pedagogies. A review of extant research on active learning is presented with some practical strategies classroom teachers can use to assess, formatively or summatively, the efficacy of such pedagogies. Four policy implications are mentioned for implementing active learning.

Constructivism as Pedagogy

How do people learn best? John Dewey (1899) said that people learn best "by doing". Hands-on instructional tasks encourage students to become actively involved in learning. Active learning increases students' interest in the material, makes the material covered more meaningful, allows students to refine their understanding of the material, and provides opportunities to relate the material to broad contexts. Constructivism also supports the social dimensions of learning; i.e., people learn best when actively working with others as partners (e.g., cooperative learning) (see e.g., Johnson, Johnson, & Johnson-Holubec, 1994). Thus, constructivist pedagogy is aligned with the moral commitment to provide all students with high quality developmentally appropriate instruction (Udvari-Solner & Kluth, 2007).

Constructivism is aligned with progressive thinking. Constructivism is not a

theory about teaching and learning per se; rather, it is a theory about the nature of knowledge itself. Knowledge is seen as developmental, socially constructed, and culturally mediated. Learning, then, becomes a self-regulated process wherein the individual resolves cognitive conflicts while engaged in concrete experiences, intellectual discourse, and critical reflection (Foote, Vermette, & Battaglia, 2001; Rodgers, 2002). The principles of constructivist paradigms support the view of educators as informed decision-makers.

Accordingly, learning is a socially mediated process in which learners construct knowledge in developmentally appropriate ways and that real learning requires that learners use new knowledge and apply what they have learned (Vygotsky, 1934/1986; Bransford, Brown, & Cocking, 1999). These beliefs emphasize “minds-on” learning. This endorses the belief that all learners must be intellectually engaged in the learning process by building on their previous knowledge and experiences, and applying their new learning in meaningful contexts.

More specifically, students who are encouraged to “gather, assemble, observe, construct, compose, manipulate, draw, perform, examine, interview, and collect” are likely to be engaged in meaningful learning opportunities (Davis, 1998, p. 119). Students may, for example, gather facts about Shoah history by exploring primary and secondary sources, even exploring the Internet, and then compose essays about key historical figures. Students of diverse learning styles may become involved in cooperative group projects in topics they deem interesting. Students may record their observations about reading selections and react to video segments in personal reaction journals. Students may construct posters demonstrating artifacts, while teams of students may interview survivors and others.

A strong argument made that early Jewish education systems clearly saw the value in constructivism. The gemara (Brakhot 63b), explains that we learn *beavruta* because the different styles of the two participants (note that they are, ideally, actively engaging in learning, as opposed to listening to a lecture; see Brown & Malkus, 2007 for a recent study on this point).

A Rationale for Differentiating Instruction

Fundamental to differentiation of instruction is a belief that a heterogeneous class is a most viable method for grouping students. The debate between ability and heterogeneous grouping can be traced back directly to Talmudic times. The Talmud in Tractate *Brakhot* 27b tells the story of a dispute that took place between Rabban Gamliel, who at the time was the head of the academy in *Yavneh*, and Rabbi Yehoshua. As a result of this dispute Rabban Gamliel was relieved of his duties as the Nasi, and was replaced by Rabbi Elazar ben Azarya. The Talmud dictates that a heterogeneous educational environment affected the quality of learning that took place in the yeshiva. An argument can therefore be made, based on this *gemara* that *Hazal* did, in fact, favor a more heterogeneous academic setting.

Differentiation of instruction has recently gained greater attention in Jewish education literature (see, e.g., Focus on: Differentiated instruction, 2006, in the *Jewish Educational Leadership*, entire theme). Calls for differentiating instruction have gained strength in secular education literature too over the past decade. Conceptually and theoretically grounded in the work of progressive education (Dewey, 1900), child development (Erikson, 1995), social and intellectual development (Vygotsky, 1934/1986; Piaget, 1936), learning styles (Dunn, 1995), and multicultural education (Banks, 2004), differentiated instruction has been most recently articulated and promulgated through the work Carol Tomlinson (2001; 2003).

Teaching for a diverse student population is certainly challenging. Then again, teaching well is itself a challenging enterprise requiring knowledge expertise, talents in communication, pedagogical savvy, appreciation of varied student learning styles, etc. (Parkay & Stanford, 2006). Teaching, historically, has been plagued by a one-size-fits-all mentality (Berman, 2006). As Tomlinson (2005) simply yet accurately posits, “[W]e teach as we were taught” (p. 183).

Classrooms have always been heterogeneous. Yet, when students, to teachers, appear alike ethnically, linguistically, or culturally educators have made the erroneous assumption that all students learn the same way, hence teaching

becomes uni-faceted.

In a classroom wherein the teacher appreciates differences in learning styles and understands the importance in allowing students to demonstrate content knowledge in alternate ways, active learning is more likely encouraged. George (2005) explains, "Heterogeneous classrooms help ensure that all students are exposed to a complex, enriched curriculum, and to spirited instruction" (p. 188). Mrs. Grunberger, in the scenario above, clearly valued differentiation because she encouraged shared learning experiences and offered students opportunities to demonstrate content knowledge in varied ways.

Research on Active Learning

Active learning is fostered when knowledge is viewed as a process of constructing meaning through exploration and when students are provided opportunities to demonstrate their knowledge in different ways. But what does research say about the efficacy of active learning?

Curriculum reforms efforts in the US during the 1960s and 1970s promulgated research findings that supported the use of "inquiry learning" as an effective means to encourage pupil motivational levels in learning tasks as well to raise student achievement (Darling-Hammomd, 1997). The Effective Schools Research movement heralded by Ronald Edmonds (1979) and colleagues in the 1980s brought attention to various "correlates" to student achievement, including, among others, high expectations for student learning, monitoring of student progress, and high student engagement in learning. Rosenshine (1971) and others highlighted principles of effective instruction and student engagement that served to promote student learning and achievement. Among the most relevant, research findings include:

Abstract ideas need to be first made concrete through the use of objects, illustrations, manipulatives, and examples (through hands-on learning) (Mayer, 2008)

Graphic organizers and visual frameworks should be used when introducing new content and when designing student worksheets. (Mayer, 2008)

Inductive [indirect] instruction is often preferable to deductive [direct] instruction because the content becomes more meaningful if the learner is guided to discover rules, definitions, & attributes. (Bruner, 1966; Good & Brophy, 2007)

Students need to be allowed to interact verbally in order to process new learning for increased understanding and retention (Slavin, 2008).

Opportunities for practice must follow instruction. (Rosenshine, 1971; Good & Brophy, 2007)

Other studies revealed benefits of active learning in specific subject areas. Newmann, Marks, and Gamoran (1995) found increased levels of achievement for student who were taught with active learning pedagogies in mathematics and social studies. These researchers identified what they called “authentic pedagogies” in which instruction focused on real-world contexts that called for higher order thinking and interaction with the world outside the classroom, among others. Lee, Smith, and Croninger (1995) found that students in high schools that emphasized “authentic instruction” experienced greater gains on achievement tests than students who were taught with more traditional pedagogies (e.g., lectures or frontal teaching). More specifically, the researchers noted that “an average student who attended a school with a high level of authentic instruction would learn about 78 percent more math between eighth and tenth grade than a comparable student in a school with a low level of authentic instruction” (Lee, Smith, & Croninger, 1995, p. 9 as cited in Darling-Hammond, 1997). Bonwell and Eison (1991), both of whom popularized the term active learning, found that active learning was equally as effective as traditional pedagogies for content mastery, but far exceeded traditional methods in regards to developing critical thinking.

Finally, in one of the most comprehensive and methodologically research studies undertaken, Prince (2004) in an article entitled “Does Active Learning Work? A Review of the Research,” concludes that:

Although the results vary in strength, this study has found support for all forms of active learning examined... The best evidence suggests that

faculty should structure their courses to promote collaborative and cooperative environments... Teaching cannot be reduced to formulaic methods and active learning is not the cure for all educational problems. However, there is broad support for the elements of active learning most commonly discussed in the educational literature and analyzed here. (p. 7)

Strategies for Assessing Active Learning: Some Concrete Examples

Student achievement levels on standardized tests ultimately determine the efficacy of active learning instructional approaches. Some of the research cited in the previous section indicates gains made by students exposed to active learning. Classroom teachers and supervisors may want some in-class assessment instruments, however, to allow them to either evaluate student learning from time to time or collect data on learning so that instructional adjustments can be made along the way (i.e., through use of formative assessment practices). Although a complete discussion of such assessment practices goes beyond the purposes of this brief article, below you will find three practical strategies or tools that you can use to gather data on student activities during active learning engagements.

First Assessment Instrument: Group Performance: Assessment of Individual Participation

Cooperative learning (Johnson, Johnson, & Johnson-Holubec, 1994) activities are a popular way to actively engage students in learning. Mrs. Grunberger's eighth graders in the opening scenario above employed such approaches. The assessment instrument below can be used to monitor group performances and assess individual participation, always a concern whenever grouping is employed.

Table 1 illustrates the participation of one particular student, Chaim, during a cooperative learning activity. You can as easily observe a whole group or a number of individual students for any specified period of time. The observer checks off the level of participation of the individual students and adds

comments to situate the involvement of the student and clarify the quality of the interaction. The tool can easily be modified to suit any classroom situation. Readers are encouraged to do so.

Table 1 Group Performance: Assessment of Individual Participation*

Student: Chaim

A. Contribution to group goals **Regularly** **Sometimes** **Rarely** **Comments**

1. Participates in the group's activities	X			
2. Does his or her share of work		X		Sometimes allows the more assertive students to control work

B. Staying on the topic

3. Pays attention; listens	X			
4. Makes comments to help group get back on topic			X	Again, lets the more dominant students control
5. Stays on topic	X			

C. Offering useful ideas or information

6. Gives helpful ideas & suggestions		X		
7. Offers helpful feedback & plans		X		Reticent to Criticize
8. Influences group decisions & plans		X		

D. Consideration of others

- | | | | |
|--|---|---|-----------------------|
| 9. Makes positive, encouraging remarks about group members & their ideas | | X | Reserved |
| 10. Shows & expresses sensitivity to the feelings of others | X | | Considerate of others |

E. Involving, working, & sharing with others

- | | | | |
|---|--|---|----------------------------|
| 11. Tries to get the group working together to reach group agreements | | X | Lets others lead the group |
| 12. Considers the ideas of others: exchanges, rethinks, defends ideas | | X | Participates at times |

F. Communicating

- | | | | |
|---|---|---|--|
| 13. Speaks clearly; easy to hear & understand | X | | When he participates, he speaks clearly, though softly |
| 14. Expresses ideas clearly & effectively | | X | Tries hard; seems to think before speaking |

Class: 5-1

Date:4-9

Time: 9:20-10:15

*Modified from the Connecticut of Education- Sponsored by the National Science Foundation; appearing in Sullivan and Glanz (2009)

Although this instrument is not aimed at quantitatively assessing Chaim's learning of the content material, it does provide the observer (teacher or supervisor) with information about Chaim's activities during an active learning

engagement that might otherwise be missed or without specific data on his behavior. The teacher, in this case, can then take steps to work with Chaim to better improve his interactions when working in cooperative learning groups.

Second Assessment Instrument: Accountable Talk: Teacher Behaviors that Promote Active Learning

A learning concept that has recently emerged from the accountability movement and cooperative learning is accountable-talk. It is based on the principle that classroom talk that promotes active learning is essential to student achievement. The following observation tool, Table 2, is based on the three ways that student talk should be accountable: to pedagogical strategies that promote student active thinking (first box below), to pupil interactions during the lesson (second box), and during havruta learning (third box). For further information on accountable-talk, contact the Institute for Learning at the Learning Research and Development Center at the University of Pittsburgh or click on the following link:

<http://www.teachersnetwork.org/tnli/research/achieve/Watson%20%20072601.pdf>

Table 2 Teacher Indicators of Accountable Talk

Table 2 Teacher Indicators of Accountable Talk

Teacher Indicators	Response	Observations
Engages students in talk by: <ul style="list-style-type: none"> • Providing opportunities for students to speak about content knowledge, concepts, and issues • Using wait time/allowing silence to occur • Listening carefully • Providing opportunities for reflection on classroom talk 	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Rebbe consistently waited for students to answer. You could see his thinking about the response. Encouraged student active participation. At the end of the class, group reflectors reported on the process in their groups.</i>
Assists students to listen carefully to each other by: <ul style="list-style-type: none"> • Creating seating arrangements that promote discussion • Providing clear expectations for how talk should occur 	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>The class reviewed the guidelines for discussion before going into circles of small groups where a reflector and facilitator were chosen. No time remained at the end of class to review group work.</i>
<ul style="list-style-type: none"> • Monitoring havruta work ensuring each pupil is actively participating 	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Most students actively engaged in on-task behavior during sugya review; Ephraim, however, is too passive and needed encouragement to share his views; Moshe was too talk domineering.</i>

Class: 9th grade

Date: 4-17

Subject: Gemorah Block

Third Assessment Instrument: The Differentiated Classroom

Differentiated instruction is advocated and supported in the literature. Active learning is enhanced within a differentiated learning environment.

Differentiated instruction takes place when teachers are aware and able to consider and deal with different learning needs and abilities of their students.

But how can one assess specific classroom characteristics of differentiated instruction along with specific student behaviors that demonstrate varied active learning practices? The assessment instrument found in Table 3 allows the observer, teacher or supervisor, to describe elements present or absent in the lesson. Table 4 illustrates a qualitative version for observing the differentiated classroom. Please note that no classroom should or can exhibit all of the indicators in the tool that follows.

Table 3 The Differentiated Classroom, Quantitative

Table 3 The Differentiated Classroom, Quantitative

Classroom Characteristics	Presence of Element	Comments/Description
1. Range of activities a. whole-class instruction b. small-group activities (pairs, triads, quads) c. individualized activities e.g., learning centers independent study d. student-teacher conferences	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Mini-lesson</i> <i>Turn & talk at end of mini-lesson</i> <i>Independent reading while teacher conference with individual students</i>
2. Students express themselves in diverse ways artistically musically technologically scientifically athletically through drama/speeches traditional compositions building models other	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Class sang a song related to read-aloud</i> <i>Some at computers during independent reading</i> <i>Stretching to song before independent work</i>
3. Students construct meaning on their own/ take responsibility for their own learning/ plan activities on their own	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Children chose their independent activity</i>
4. Learning activities are provided for students who complete work before others	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Children could choose multiple independent activities</i>
5. Peer tutoring to reinforce more advanced learners & support less advanced	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Might be a suggestion for future independent work time</i>
6. Different types of assessment are ongoing & integrated	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<i>Teacher assesses during conferences; independent activities contain self-assessments</i>

Class: 3-11 Language Arts

Date: 5-14

Time: 1:30-2:15

Table 4 The Differentiated Classroom, Qualitative

This questionnaire can be adapted to include activities mentioned in Table 3

and vice versa.

What pre-assessments of student knowledge are included prior to instruction?

How does the teacher incorporate multiple intelligences into the lesson?

How are different learning styles addressed?

What assessment strategies are used and when?

What homework options are offered?

Are all students prompted and probed equitably during questioning?

How is wait time for different students addressed?

What kind of grouping procedures are used (whole class, dyads, triads, quads)?

Are out-of-the-classroom learning experiences provided? If so, how?

Policy Implications and Conclusion

Given this research base for active learning, scholars have pointed to several policy implications affecting instruction (see, e.g., Darling-Hammond, 1997). First, curriculum developers are encouraged to create units of instruction and learning activities that support in-depth inquiry rather than superficially covering a lot of material. One of the advantages of a UbD design (Wiggins & McTighe, 2005), for instance, is that it encourages focused attention to enduring understandings and essential questions that facilitate deep learning experiences wherein depth is not sacrificed for breadth. Second, assessment instruments should focus on understanding, not merely recall of facts and information. Third, authentic learning can be enhanced by extending blocks of time for learning away from the traditional 30-40 minute period. Fourth, teachers must be rewarded for incorporating “activity-based learning rather than . . . using only lecture and recitation models” of instruction (Darling-Hammond, 1997, p, 57).

There will always be those educators who rely on a more traditional paradigm of teaching (i.e., frontal whole-class instruction) who might harbor some suspicions that active learning doesn't really deepen learning, but rather just makes it “more fun.” Whether ignoring extant research or merely adhering to more traditional or conservative teaching practices, these educators, it seems

to me, fortunately comprise a minority of today's teaching force. As a result of cutting-edge technologies in schools of teacher preparation and increasingly sophisticated professional development opportunities for in-service teachers, active in-depth learning is acknowledged and encouraged, when appropriate. This article has reviewed the benefits of constructivist and differentiated teaching to promote active learning engagements. Relevant research has been indicated, policy implications highlighted, and some practical tools classroom teachers and supervisors might use to assess active learning.

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