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ACHIEVEMENT IN THE HIGH SCHOOL SOCIAL STUDIES CLASSROOM

The Effect of Small, Flexible Grouping on Academic Achievement in the High
School Social Studies Classroom

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Advisor _____

Date _____

Abstract

Teachers utilize formative assessment and differentiation as tools to meet diverse needs in the classroom, maximize engagement, and promote student learning. Teachers can effectively use formative assessment and differentiation through the ability to measure student understanding and use it to drive instructional decisions, implement multiple strategies to reach more students, and note the critical challenges in meeting the needs of students with multiple learning needs and skills. Using a mixed-methods study design, the researcher studied the ways in which the introduction of small flexible grouping, based on formative assessment, affected academic achievement and students' understanding of the essential learning outcomes and support in the learning process. Key instructional interventions including flexible grouping, formative assessment, and the role of student choice were identified and implemented in a high school social studies class. Findings indicate that many students saw a 50% or higher increase from the pretest to the posttest. Students also noted in feedback forms that the process helped them prepare for the post test and the strategy was helpful in the learning process.

Keywords: differentiation, formative assessment, small, flexible grouping

Students vary in background, interests, needs, and skills in classrooms around the world. In many cases, students are at different points in the learning process and teachers have to find ways of understanding and reaching all students in classrooms with diverse needs. Teachers can utilize formative assessment, a strategy of ongoing assessment to communicate progress towards goals and objectives (Hendrick, 2017). Teachers should ensure that students are continually aware of important learning objectives or goals and persistently use formative assessment to understand student learning and plan instruction (Tomlinson, 2015). This data provides insight for differentiation, a model of classroom practice intended to support teachers in creating curriculum and instruction to maximize the learning of diverse groups of learners (Tomlinson, 2015). These two tools (formative assessment and differentiation) assist in meeting students' varied needs to maximize engagement and student learning. The vision for including formative assessment as a regular classroom practice is to provide feedback based on clear and accurate information to support students' growth in comparison to learning objectives, and support teacher decision making in the classroom (Tomlinson, 2015).

Understanding students' progress is instrumental in making differentiation and instructional decisions in the classroom. Differentiation seeks to provide a variety of instructional methods to respond to the student differences (Tomlinson, 2015). Tomlinson (as cited in Wu, 2013) states, "Differentiation does not seek to label and segregate students, but rather to serve them [students] effectively in heterogeneous classrooms that are responsive to their varied needs" (p. 127). One way to meet the varied needs is to create small groups with flexibility as students' needs change. Flexible grouping provides opportunity for students to collaborate with others in many settings and many purposes.

Grouping students must involve purposeful connection to the curriculum, students focusing on targeted content and skills, and using assessments to help create groups (Lapp, Fisher, & Frey, 2012). Flexibility is critical for students to take ownership of their learning (Lou, Abrami, & Spence, 2000). Formative Assessment and differentiation will continue to be vital tools for creating small, flexible group learning strategies for educators as students continue to be more diverse in their backgrounds, interests, needs, and skills. Formative assessment, differentiation, and small, flexible instruction can provide a path to better meets the individual needs of all student in the learning process.

Review of Literature

Classrooms around the world have students of different backgrounds, interests, readiness, and levels of motivation. Students come to each classroom presenting different needs and skills. Teachers utilize formative assessment, a strategy of ongoing assessment, to communicate progress towards goals (Hendrick, 2017). This data provides insight for the use of differentiation, a model of classroom practice intended to support teachers in creating curriculum and instruction to maximize the learning of diverse groups of learners (Tomlinson, 2015). These two tools assist in meeting various students' needs to maximize engagement and student learning. The goal of incorporating formative assessment in the classroom is to provide feedback, clear and accurate information to support student growth in comparison to learning objectives, and aid teacher decision making in the classroom to meet the needs of all students in the classroom (Tomlinson, 2015).

Differentiating for students with multiple learning needs and styles can be an overwhelming challenge, but strategies like flexible grouping, (a teaching strategy that

utilizes assessment to create small group instruction using flexibility, creative thinking, and collaboration), can provide teachers with opportunities to meet the needs of these students (Tomlinson, 2015). Therefore, it is essential for teachers to understand this strategy as they execute these practices. The literature discussed will define this tool, discuss their value, discuss implementation of effective strategies, (including small, flexible grouping), and describe the critical challenges in meeting the needs of students with multiple learning needs and styles in the social studies classroom.

Definitions and Characteristics

Formative assessment seeks to provide students and teachers with information about student understanding based on learning objectives or goals (Tomlinson, 2015). Assessment is diagnostic and provides teachers with data on students' readiness for ideas, skills, interests, and their approach to learning (Tomlinson, 2014). Teachers should ensure that students are continually aware of important learning objectives and persistently use formative assessment to understand the trajectory of student learning and plan instruction (Tomlinson, 2015). The data from formative assessment provides insights into students' learning for students and teachers including judgments about the next steps that should occur in the learning process (Lapp, Fisher, & Frey, 2013). These assessments can also provide data to inform decisions before, during, and following instruction (Lapp et al., 2013). Teachers can design learning experiences for students based formative assessment data and knowledge of their students and curriculum (Wormeli, 1999).

Differentiation seeks to provide a variety of instructional methods to respond to student differences in understanding or preparedness (Tomlinson, 2015). Tomlinson (as

cited in Wu, 2013) says, “Differentiation does not seek to label and segregate students, but rather to serve them [students] effectively in heterogeneous classrooms that are responsive to their varied needs” (p. 127). This distinction is important because it provides a definite purpose to the practice of differentiation. Students do not come to classrooms with the same levels of motivation, skills, engagement, or ability, which demonstrates the need for a variety of instruction and evidence of student learning to meet these various needs (Wu, 2013). It is also vital to understand that differentiation should be present in the curriculum, instruction, and student outcomes in the classroom to meet the various needs of students and provide an opportunity for all students to learn at a high level (Tomlinson, 2015).

Envisioning the Goal

Formative assessment provides data to inform students of their progress, while also providing information to teachers about making critical instructional decisions in the classroom (Tomlinson, 2015). Tomlinson (2015) expresses the importance of using formative assessment to make critical differentiation decisions. Using quick formative assessment strategies can help teachers gain a measure on the progress of students individually and as a group and is critical for making students partners in the classroom (Wu, 2013). A quick formative assessment can be an excellent tool for developing activities such as flexible group activities and other strategies (Wu, 2013). Differentiated classrooms do not separate assessment from instruction because assessment informs every decision (Wormeli, 1999). Data can be used to evaluate each student’s progress towards well-articulated goals that correlate with standards (Lapp et al., 2013). This collection of performance data can provide insights that support differentiated instruction

through grouping configurations (Lapp et al., 2013). Lynch and Warner (2008) also point out that ongoing assessment can be a useful tool for making decisions about differentiation.

The ultimate goal of differentiation is to meet the needs of a mixed-ability classroom and improve student learning for all students. Differentiation can improve many facets of student learning and teacher effectiveness (Tomlinson, 2015). Lynch and Warner (2008) remind us that research shows differentiation can improve test scores, student engagement, and the willingness of educators to attempt new instructional approaches. Teachers can begin by understanding where to differentiate in their classrooms to achieve these results.

These goals of differentiation establish the need for educators to vary their practice in the areas of planning and process of learning, while also being present in the instructional methods and products that students use to demonstrate learning in the classroom. Both Delinda and Whittaker (2006) and Lynch and Warner (2008) state that teachers can execute differentiation in the areas of instruction, curriculum, or grading. Delinda and Whittaker (2006) emphasize that educators can show differentiation in the content, product, and effect of teaching and practice, while Lynch and Warner (2008) suggest that an educator's flexibility in instruction and curriculum should include a different teaching pace of education and implementation of strategies. The research of Crim, Kennedy, and Thornton (2013) adds that students should receive a variety of different methods to show evidence of their learning to match the skills, interests, and ability they bring to the classroom.

Delinda and Whittaker (2006) also suggest that learning environment, classroom function, and classroom feeling should also be a consideration in differentiation. The learning environment can play a significant role in differentiating in the classroom and teachers might consider making physical changes such as furniture arrangement and spacing to help improve student learning (Delinda & Whittaker, 2006). The researchers also posit that even the availability of supplies and materials, including technology, could be varied based on student needs and procedures for working at various places in the room for various tasks and can be adjusted based on student need in the process (Delinda & Whittaker, 2006).

Lynch and Warner (2008) suggest teachers should teach to multiple levels of ability and consider the learning level of all students, pace, formats, and tolerance of errors can be contributing factors to differentiation for students with a variety of abilities and readiness to learn. Students with significant disabilities cannot participate at the same academic level of other students and language, motor skills, and methods of demonstrating learning must be adjusted to meet the needs of these learners (Lynch & Warner, 2008). When teachers consider the learning of objectives of a unit, they must incorporate multiple methods to respond to assignments, teach to multiple levels, overlap curriculum, reteach, and promote ongoing assessment to help students grow (Lynch & Warner, 2008). Some students will not learn all the material of more advanced learners, but a teacher must ensure that the essential content is part of the instruction for everyone in the classroom (Lynch & Whittaker, 2008).

The demographics within a classroom present a wide variety of disabilities and understanding as a challenge to differentiation (Lynch and Warner, 2008). Students have

a broad range of needs and skills that are sometimes not addressed in a ‘one size fits all’ form (Crim et al., 2013). This strategy does not accurately encompass all students and teachers need to create a space to foster individual interest, skill, and ability (Crim et al., 2013).

Strategies

The creation of learning objectives provides students with clear expectations for their learning while guiding assessment and instruction for teachers (Tiesco, 2004). Teachers should use formative assessment to determine student understanding of learning objectives, strengths and areas of improvement, interests, and learning styles (Tiesco, 2004). This information serves as a communication tool to students about their progress while giving teachers valuable insight into how to help students achieve in the classroom (Tomlinson, 2015). Providing clear and accurate feedback can help students understand where they are in the learning process and the learning objectives (Tomlinson, 2015). Tomlinson (2015) argues as students begin to grasp the learning objectives, teachers should develop a meaningful practice for students at levels slightly beyond their current understanding and development and create an environment where students help one another learn and know how to learn (Tomlinson, 2015). Data from formative assessments can help teachers make informed decisions and improve the effectiveness of differentiation in the classroom (Wu, 2013).

There are many methods to differentiate in the classroom. Flexible grouping and student choice can be useful elements and strategies in this process (Wu, 2015). Tomlinson, as cited in Wu, 2013, says, “Flexible grouping means grouping and regrouping students frequently and mindfully so that they have opportunities to work

with many peers in a variety of settings and with a variety of purposes” (p.128).

Grouping students must involve purposeful connection to the curriculum, students focusing on targeted content and skills, and using assessments to help create groups (Lapp, Fisher, & Frey, 2012). Flexibility is critical for students to take ownership of their learning. Flexible grouping works best when activities are carefully designed to promote positive interdependence and individual accountability (Lou, Abrami, & Spence, 2000). In this model, all members receive the same recognition for the group’s accomplishments such as a group product or learning gains for all students (Lou et al., 2000). Individual accountability can be established by assigning clear tasks and roles for each member and the presence of some measure of individual performance (Lou et al., 2000).

The final element of differentiation strategies is student choice. Delinda and Whittaker (2006) discuss the need for a variety of activities based on student choice. Student choice helps improve engagement in the classroom by finding a process of learning that matches a student’s skills and interests (Lynch & Warner, 2008). Lynch and Warner (2008) propose the need for students to have a choice in the content, response, assignments, and even materials they use in class while showing learning through different projects or technology. Teachers strive to make this choice meaningful to allow students to gravitate towards their strengths and interests to promote motivation, while also recognizing that students sometimes struggle with the expectation of choice and too much freedom (Crim et al., 2013).

Student choice and support should reflect ability across the spectrum from gifted to students with special education services (Minarik & Lintner, 2011). Minarik and Lintner (2011) emphasize the need to consider students with individualized education

programs (IEPs) in the differentiation process and collaboration of social studies teachers and special education staff. Support, scaffolding, and various levels of challenge and complexity are essential elements in considering strategies for differentiation (Minarik & Lintner, 2011).

Challenges

Formative assessment and differentiation present a broad range of challenges for educators in all subject areas, including social studies. Students come from many different cultural and ethnic backgrounds, which means cultural understanding is an essential skill for educators to possess in creating assessments and instruction (Wu, 2013). Tomlinson (as cited in Wu, 2013) says, “Cultures may emphasize individualism or collectivism, reflection or action, collaboration or competition, strict attention to time or looser attention to time” (p. 131). This understanding becomes essential as class sizes continue to grow and become more diverse (Delinda & Whittaker, 2013). Not only is it critical that teachers have cultural understanding, but also the representation of ethnic diversity in social studies curriculum as a form of differentiating to engage students (Delinda & Whittaker, 2013).

Time also presents a significant challenge to the practice of formative assessment and differentiation in the classroom (Wu, 2013). Teachers can collaborate with colleagues outside their content area for ideas, but they should also work with colleagues within their content area for ideas more explicit to their curriculum (Wu, 2013). It is vital that teachers take differentiating in the classroom one step at a time and not try too much all at once and to start with strategies that do not thoroughly change their methods of teaching (Wu, 2013). In this journey, teachers will build a little at a time to better meet

the needs of their students and help them improve their learning outcomes (Wu, 2013).

Additionally, teachers need regular training with strategies for managing and creating groups continually in this process (Tiesco, 2005).

Gaps

Formative assessment and differentiation continue to be growing topics of research learning (Wu, 2013). Tomlinson (2015), Delinda and Whittaker (2013), and Wu (2013) indicate more research involving cultural subgroups is needed and Minarik & Lintner (2011) add that more research related to formative assessment and differentiation could help students in special education service. More research on the connection between universal design learning and multicultural education with differentiation is needed. A more precise understanding of addressing the cultural needs and differences requires additional research. Additionally, more strategies for useful differentiation for students with special education services in the social studies classroom are also necessary to support this important subgroup of students.

Conclusions and Current Study

It is evident that teachers should ensure that students are continually aware of essential learning objectives and persistently use formative assessment to understand student learning and plan instruction (Tomlinson, 2015). Additionally, teachers should provide clear and accurate feedback and help students understand this information, develop a meaningful practice, and create an environment where students help one another learn and know how to learn (Tomlinson, 2015). Data can be used to evaluate each student's progress towards well-articulated goals that correlate with standards (Lapp et al., 2013). This collection of performance data can provide insights that support

differentiated instruction through small, flexible grouping configurations (Lapp et al., 2013).

Effective differentiation envisions the purpose of differentiating as meeting the needs of students with diverse needs, while not labeling or segregating students (Wu, 2013). Both Delinda and Whittaker (2006) and Lynch and Warner (2008) show the importance of implementing strategies that promote student choice, while Wu (2013) demonstrated the importance of flexible grouping. Wu (2013) and Delinda and Whittaker (2006) also demonstrated the importance of cultural understanding, while Crim et al., (2013) discussed the importance of creating opportunities for multiple learning needs. Minarik and Lintner (2011) demonstrated the need for collaboration to support and differentiate for students in special education services as challenges to meeting these diverse needs. Formative Assessment and differentiation will continue to be vital tools for creating small, flexible group learning strategies for educators as students continue to be more diverse in their needs, cultural backgrounds, and skills.

Formative assessment plays an essential role in measuring student learning and providing data to make instructional decisions. Clear objectives and formative assessments can provide students with better understanding of the learning process and information needed to improve learning. Additionally, using formative assessment to gather data to create small, flexible groups of students to assist in differentiation and improve student understandings has the potential to help to meet the variety of student needs in the classroom. Therefore, the goal of this action research is to determine whether small, flexible grouping, based upon formative assessment, affects academic achievement, student understanding of essential learning objectives, and support of the

learning process in a ninth-grade social studies classroom. To address this goal, this study was designed to address the following questions: 1) In what ways will small, flexible grouping, based upon formative assessment, affect academic achievement in a secondary social studies classroom? and 2) In what ways will formative assessment and small, flexible grouping affect individual students' perceptions of their understanding of essential learning objectives and support of the learning process in a secondary social studies classroom?

Methodology

To answer these questions, a mixed-methods design was employed. The population of this action research study was conducted with 9th grade student participants enrolled in a World history course at a parochial school in a Midwestern medium-size city (N=18). Seventy-five percent of students at the school receive some form of financial aid in the payment of tuition. This sample included 18 9th grade students enrolled in World history classes during the first and second quarter of the first semester. Additionally, the sample consisted of seven female students and eleven male students. World history is a required class, and the sample was representative of the forty-one total students taught in two sections of 9th grade World history.

This study drew on data collected from classroom observations, student feedback, and analysis of student work in the interest of triangulation. Pre- and post-assessments were conducted in the form of teacher-made tests consisting of multiple choice and open-ended questions designed to measure student understanding of the impact of religion on specific events in World history. Additionally, multiple-choice questions aimed at the understanding of religious concepts including nirvana, the Middle-Path, Brahman, and

reincarnation. Open-ended questions from the pretest included concepts such as explaining the reasons for tension between the Palestinians and Israelis, motivations of the Conquistadors, motivations of Christians and Muslims during the Crusades, and analyzing the origins of the tensions between India and Pakistan. Finally, data from teacher-made quizzes of multiple choice questions was used to create small flexible groupings of students for teacher-made lessons.

The data from these assessments helped guide the process of small, flexible grouping to create groups of same-ability students. Each group was monitored using teacher observation checklists that measured student participation and behavior. Lastly, student feedback was gathered using a Google Forms. This student feedback collection tool helped determine student perceptions of small, flexible grouping and the helpfulness of these groups in the learning process.

First, the teacher administered a pre-assessment in the form of a teacher-made test using multiple choice and open-ended questions to help determine the prior knowledge of students in the class. Data from the pre-assessment was used to record students' academic achievement at the beginning of the study and will also be compared with post-assessment data later. With the aid of Google Slides and Peardeck, the teacher provided direct instruction in the form of lecture and small group discussion to introduce the objectives and key concepts of Hinduism and Buddhism. Next, the teacher provided a quiz in the form a teacher-made test with multiple choice questions to determine student understanding of and knowledge related to Hinduism and Buddhism following direct instruction. Students were placed into small, flexible groups with peers that demonstrated a similar understanding and ability of the quizzes. For example, students that scored

below 80% accuracy were placed in groups together, while students below 80% worked together and had additional teacher support. The data from the formative assessments was used to help guide the process of small, flexible grouping to create groups of same ability students.

During the teacher-generated small, flexible group lesson plan, the teacher conducted an observation of student behavior and participation using an observational checklist. This observation data included time spent actively participating with group members, which included: a) working only on the assigned task (i.e. not working on other assignments) and working together to complete the assignment, b) observations of respectful behavior within groups, including positive interactions and resolving disagreements without yelling or putting people down, c) group attempts at completing work before asking the teacher questions, such as discussion among the group and/or searching before asking the teacher for help, d) group on-task behavior, including not playing games or being distracted by group chat, and e) group completion of the assignment, which included turning in the assignment on Google Classroom.

Direct instruction, teacher-generated quizzes, small flexible grouping, and teacher observations were repeated three more times to determine student knowledge and behaviors in the areas of Judaism and Daoism, the Crusades, and the Israeli-Palestinian Conflict and India-Pakistan Conflict. After all these steps, a post-assessment in the form of a teacher-made test with open-ended questions was used to compare student results with pre-assessment and quiz data on an individual student and whole-class basis to help determine academic success and growth in the unit. Finally, with the aid of Google Forms, students provided their feelings on small, flexible grouping and its helpfulness in

the learning process. The teacher used this feedback to help determine the success of small, flexible grouping in the World history classroom.

Analysis of Data

Data for this study included a teacher-made pretest, a teacher-made posttest, teacher observations during small, flexible grouping activities, and responses to a student feedback form. Calculations of the mean, median, mode, and standard deviation for pretest and posttest data were compared using Microsoft Excel. Following these calculations, data from the pretest and posttest was entered into the statistical analysis program, StatKey, to conduct a difference in mean t-test to verify if the hypothesis that small, flexible grouping using formative assessment data does make a difference in student academic achievement. The null hypothesis in this test was that there is not a difference between the pretest and posttest scores. Using StatKey, a right-tail test was conducted as part of this process to compare the means of the pretests and posttests. Findings from StatKey were used to display data and to compared with findings from teacher observations and student feedback.

Findings from the paired sample t-test were compared with student participation and behavior data from all eighteen students collected during teacher observation including time spent actively participating, group staying on task, and group completing and turning in small, flexible group work assignments. Data from the teacher observations were ranked on a scale of one to five: One represented none of the time, two represented a quarter of the time, three represented about half the time, four represented most of the time, and five represented all of the time. The mean, median, and mode

scores for the class were determined using Microsoft Excel to help demonstrate student engagement behaviors and participation in the small, flexible group activities.

Finally, responses from the student feedback form were collected using Google Forms. Student responses to the questions about preferred style of learning, helpfulnesses of formative assessment on posttest, and use of formative assessment in helpfulness in the learning process were tallied from the student feedback Google Form. Graphs and charts from Google Forms were used to highlight student response. This feedback was used to help determine if small, flexible grouping using formative assessment data made a difference in academic achievement and to triangulate the data. Student feedback was used to make adjustments to small, flexible grouping using formative assessment data practices and activities in the future.

Findings

The research design sought to determine in what ways small, flexible grouping, based upon formative assessment, would affect academic achievement. Student feedback, in addition to observational and assessment data, was collected and analyzed to help determine how small, flexible grouping affected individual students' perceptions of essential learning objectives and support of the learning process. *Impact on Academic Achievement*

The first research question in this study asks: in what ways will small flexible grouping, based on formative assessment, affect academic achievement in a secondary social studies classroom? To answer this question, the researcher assessed students starting understanding and knowledge of world religions and religious clashes in World history with a teacher-made pretest consisting of multiple-choice and short open-ended

questions. The 9th-grade teacher collected the data from this pretest and calculated the mean, median, mode, and standard deviation of the 18 students' scores. Table 1 displays the results of the pretest by percent accurate. Of the 18 students, all but three students demonstrated 20% accuracy or higher on the pretest. However, the mode in this study demonstrated a 33.33% accuracy without any direct instruction, which implies some basic understanding of religions and religious conflict. This study continued to build off of this understanding with direct instruction and small, flexible grouping based on formative assessment data.

Table 1			
<i>Pretest Data</i>			
<u>Mean</u>	<u>Median</u>	<u>Mode</u>	<u>Standard Deviation</u>
28.67	26.67	33.33	14.40
<i>Notes: Numbers in the table represent percent accuracy on the pretest.</i>			

During the first flexible grouping instruction, six groups were observed by the 9th-grade teacher for active participation, respectfulness, completion of work before asking teacher questions, on-task behavior, and completion of the assignment. The scale of this observation was 1 to 5: 1 was none of the time, 2 was less than a quarter of the time, 3 was about half the time, 4 was most of the time, 5 was all the time. Table 2 will show the mean and mode of each of these categories from the first small, flexible grouping activity.

Table 2			
<i>Observations from First Small, Flexible Grouping Activity</i>			

	Active Participation	Respectfulness	Completion of work before asking teacher questions	On-task behavior	Completion of the Assignment
Mean	4.83	5	4.67	4.83	5
Mode	5	5	5	5	5

The first small, flexible grouping activity observations demonstrated high levels in all categories. All groups except for three were observed to be asking the teacher questions before completing the questions, but this higher rate could be attributed to the students' uncertainty of the expectations of the new assignment. Only one of the groups was observed not actively participating and demonstrating the on-task behavior. Overall, students were observed to be productive and completed the assignment.

Following direct instruction on the Daoism and Judaism, the Crusades, and the Israeli-Palestinian Conflict, two more teacher observations of small, flexible grouping based on multiple-choice formative assessments were conducted. Table 3 show the same areas of student behavior and the same ranking scales. The second observation showed lower rates of on-task behavior. Additionally, the second observation saw a slight decrease in the completion percentage, but this could be attributed to a shortened schedule in the school day because of a school assembly in the afternoon. Overall, the data helps to show that students were mostly engaged in the small, flexible grouping activities.

<p>Table 3</p> <p><i>Observations from Second Small, Flexible Grouping Activity</i></p>

	Active Participation	Respectfulness	Completion of work before asking teacher questions	On-task behavior	Completion of the Assignment
Mean	5	5	5	4.67	4.83
Mode	5	5	5	5	5

Table 4 below shows data from the third observation of small, flexible grouping. The third observation saw that the mean was very similar to the first observation. Students saw a decrease in the completion of work before asking questions compared to the second observation, but saw an increase in on-task behavior and completion of assignment. Overall, the data helps to show that students were mostly engaged in the small, flexible grouping activities.

Table 4					
<i>Observations from Third Small, Flexible Grouping Activity</i>					
	Active Participation	Respectfulness	Completion of work before asking teacher questions	On-task behavior	Completion of the Assignment
Mean	5	5	4.5	4.83	5
Mode	5	5	4	5	5

After all teacher observations and formative assessment were completed, the 9th-grade teacher assessed student learning with a teacher-made posttest consisting of open-ended questions. Open-ended questions were very similar to the pretest, but asked

students to explain concepts such nirvana, the Middle-Path, Brahman, and reincarnation with more detail. The 9th-grade teacher calculated the mean, median, mode, and standard deviation of the posttest scores in percent accuracy as shown in Table 5.

The posttest did reveal an increase in mean from 28.67% to 91.66% accuracy. In the posttest data, the median is higher than the mean, which was not true in the pretest. This finding does include two outliers at 75% accuracy which bringdown the mean slightly. Sixteen (88.89%) students showed a level of 80% accuracy or higher on the posttest. Thirteen (72.22%) demonstrated a level of 90% accuracy or higher on the posttest. These results demonstrate gains made in identifying the concepts such nirvana, the Middle-Path, Brahman, and reincarnation and explaining the reasons for tension between the Palestinians and Israelis, motivations of the Conquistadors, motivations of Christians and Muslims during the Crusades, and analyzing the origins of the tensions between India and Pakistan.

Table 5			
<i>Posttest 5</i>			
Mean	Median	Mode	Standard Deviation
91.66	94.40	97.20	8.02

Figure 1 demonstrates the percent increase from the pretest to the posttest. Eleven (61.11%) of the 18 students saw an increase of 60%-79% increase in percent accuracy between the pretest and posttest. The average increase for the 18 9th graders between the pretest and posttest was 62.99% increase with in median of 67.73 increase and a standard deviation of 13.65%. This data showed 14 (77.78%) of students saw 50% or higher increase from the pretest to the posttest.

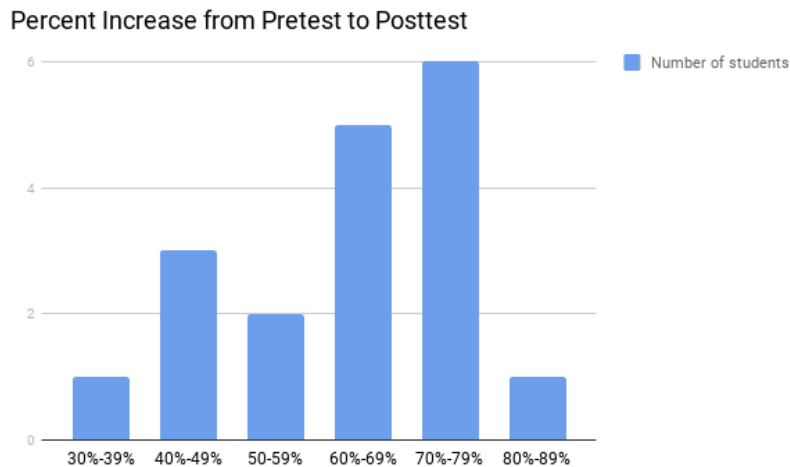


Figure 1. Percent Increase from Pretest to Posttest.

Figure 2 shows the difference in mean test equation that was used to help determine if the pretest and posttest means were statistically different. The equation showed a t-value of 16.23. This result was evaluated using StatKey to calculate the p-value and determine if the null hypothesis, the theory that the differences between the means of the pretest and posttest means is not statistically different, could be rejected. The p-value was calculated at less than .001 as shown in Figure 3. With this information the null hypothesis can be rejected, it also helps demonstrate that there is a statistical difference between the mean of the pretest and the posttest.

Difference in mean test

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Figure 2. Difference in Mean Test Equation.

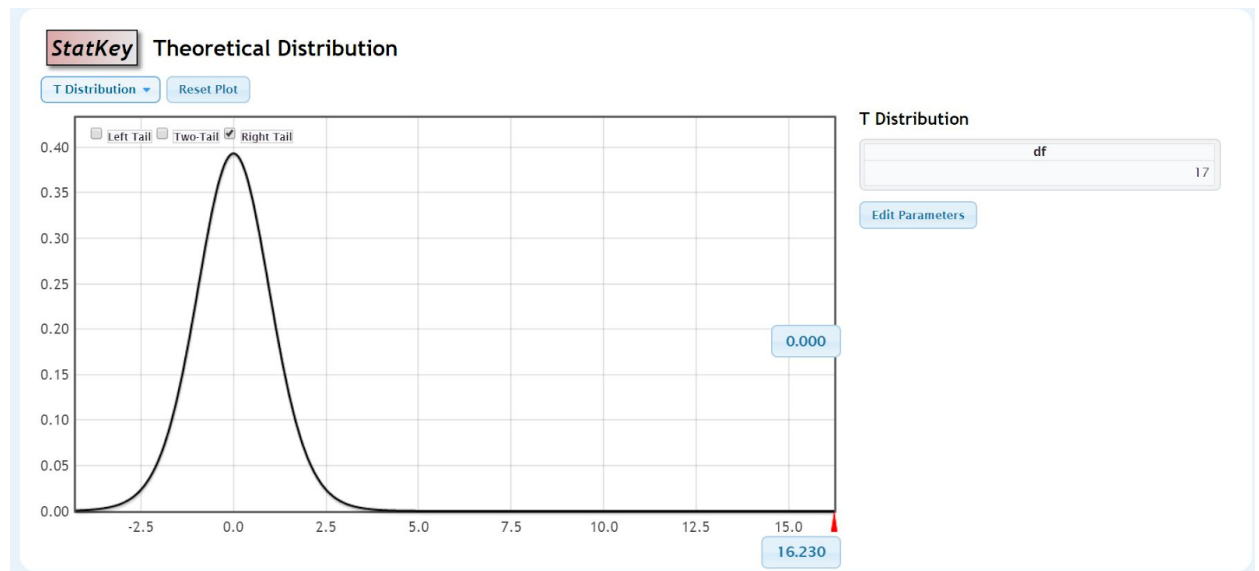


Figure 3. T-Test of Difference in Means.

Student Perceptions of Learning Objectives and Helpfulness

The second question asks students to provide feedback regarding the use of small, flexible groups, based on formative assessment, on individual students' perception of understanding the essential learning outcomes and helpfulness in the learning process. Following the posttest, students were asked to complete a student feedback form using Google forms. All 18 9th grade students from the World history class were asked multiple-choice questions regarding their preferred way to learn if formative assessment helped prepared them for the posttest, and if formative assessment and small, flexible grouping assignments helped them better understand the essential learning outcomes.

Figure 4 shows student responses to their preferred way of learning material in the World History classroom. Three (16.67%) students preferred direct instruction including lecture, three (16.67%) preferred videos including flipped classroom and other videos, and 12 (66.67%) preferred working in small, flexible groups. The student feedback shows

that 2 out of 3 students preferred the primary learning method as compared to other methods used in the unit.

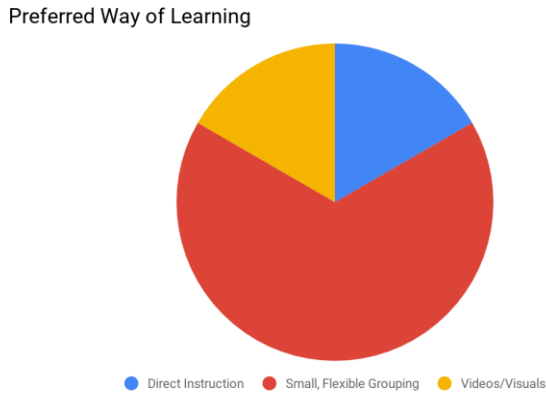


Figure 4. Student Responses to Preferred Way of Learning.

Figure 5 depicts the perceptions of World history students' beliefs related to formative assessments helping to prepare them for the post-assessment. Fifteen (83.33%) students indicated that the formative assessments helped prepare them for the posttest, while one (5.56%) felt formative assessments did not help prepare him/her for the posttest, and 2 (11.11%) felt that formative assessments only helped slightly in preparing them for the posttest. This data shows that 5 out of 6 students in the World history class found that formative assessment was helpful in preparing them for the posttest.

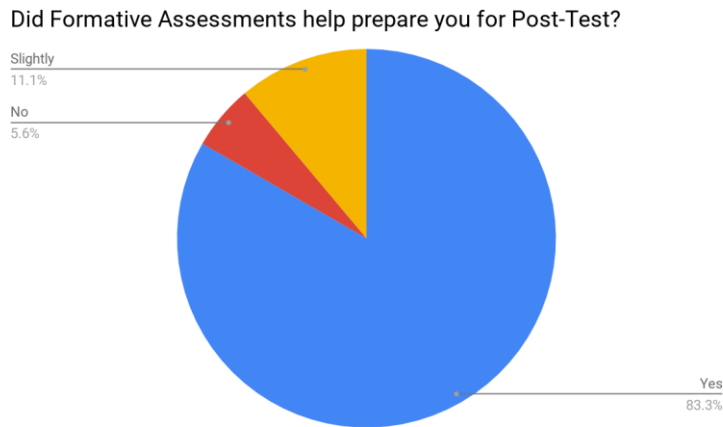


Figure 5. Student Responses to Formative Assessment Helping Prepare them for Posttest.

Finally, students were asked to indicate if the formative assessments and small, flexible grouping assignments helped them better understand the essential learning outcomes for the unit. In the student feedback, 18 (100%) of students in the World history class indicated that it was helpful. These findings indicate that all students in this World History class felt that formative assessments and small, flexible grouping assignments helped them indicate areas of need and improvement to help them prepare for the post-assessment. This insight into student perceptions of the small, flexible grouping, based on formative assessment data, might lead us to conclude that it was helpful in the learning process.

Conclusions and Recommendations

This study sought to investigate the role formative assessment plays in measuring student learning and providing data to make instructional decisions. The goal of this research was to determine whether small, flexible grouping, based upon formative assessment, affected academic achievement, student understanding of the essential learning objectives, and support the learning process in a 9th-grade social studies classroom at a parochial school in a small Midwestern city.

The findings of this study indicate the following:

- Small, flexible grouping can promote measurable growth between similar teacher-made pretest and posttests.
- Some students saw up to 50% or more growth in percent accuracy between pretests and posttests.

- Students that show high levels active participation, respectfulness, completion of work before asking questions, on-task behavior, and completion in small, flexible group work were somewhat likely see to academic growth on posttest.
- Similar to the findings of Lou, Abrami, & Spence (2000), this research indicates that the creation of flexible grouping improved understanding of goals and outcomes and saw learning gains for all students.
- Formative Assessments helped provide more communication to students about their understanding of essential learning outcomes and provide insight into areas of improvement.
- Although data is limited to a small group in this study, it does show that small, flexible grouping helps improve student academic achievement when teaching decisions are made based on formative assessment data.

From these findings, we learn that small, flexible learning lead to learning gains of 50% or higher for some students. The success of these small, flexible grouping activities was connected with student behavior and participation. This research also shows that students became more aware of the essential learning objectives and found this strategy helpful in the learning process.

Based on the findings and conclusion of this study, the following recommendations are given:

- To help compare the conclusions, perceptions, and interests of students, this study could be replicated with more students to determine the generalizability of the findings.

- Additional studies could also include more diverse students as the students of this study do not represent national rates of racial and ethnic groups.
- Additional studies should be conducted to include more female students to determine differences in perceptions of male and female students related to the effectiveness of small, flexible grouping.
- Studies comparing the growth percentages against other methods of teaching (i.e. direct instruction or other differentiation strategies) are recommended to help determine the growth percentage from this study.
- Essential learning objectives need to be deliberately shown in small, flexible group work to continue building connections between assignments and learning objectives.
- Small, flexible learning should include more student choice to help promote more interests from students.

Future studies should include larger numbers of students to better reflect the changing of demographics and needs of students throughout the world. More female students would also be helpful in determining the differences in effectiveness and perception of female and male students. In the future, essential learning outcomes should be more deliberately used throughout lessons to highlight and connect the activities of the learning process with the goals of the assignment. During small, flexible group learning in the future, more student choice of demonstrating learning and the inclusion of support materials such as flipped classroom videos and other resources should be included to support student learning. Student choice may lead to higher rates of engagement and more buy-in from all students.

Overall, this study showed formative assessment is vital to student understanding of the learning objectives and small, flexible grouping provided more opportunity to meet the needs of students in the classroom. Formative assessment data will continue to be a driving force for instruction decisions including how to differentiate in the classroom. The teacher researcher intends to continue to provide more student choice in small, flexible grouping and use formative assessments to provide insight into student understanding of essential learning outcomes. Based on the findings, the researcher is also interested in individualized instruction as another way to meet the needs of all students in the classroom.

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