EARNED HONORS CREDIT IN GEOGRAPHY COURSES

USING DIFFERENT ASSESSMENTS

by

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LIST OF ABBREVIATIONS

Abbreviation	Description
APHG	Advanced Placement Human Geography
ACT	American College Test
AP	Advanced Placement
IB	International Baccalaureate
MCQ	Multiple Choice Question
PLC	Professional Learning Community
IRB	Institutional Review Board
NAEP	National Assessment of Educational Progress
NSLP	National School Lunch Program

ABSTRACT

Many school districts around the United States are working to find ways to make learning equitable for all students. In an attempt to make education more equitable for all, some school districts have started to detrack students by implementing earned honors classes. However, little to no research exists regarding how honors credit should be assigned in these classes. The purpose of this study is evaluating what type of assessment methods are effective at differentiating higher level cognitive processes which can be used to assign honors credit in an earned honors geography classroom. To gather data, 9th grade students in an Advanced Placement Human Geography (APHG) course completed multiple choice, short answer and extended writing assessments on the same geographic concepts. All three types of assessments contained both lower and higher level cognitive processing questions. The study results lead to the findings that short answer questions are the most effective assessment method at differentiating student cognitive skill levels when assigning honors credit in an earned honors geography classroom. These findings will be useful for administrators and APHG teachers as they begin to create systems that implement earned honors.

INTRODUCTION

Following numerous incidences of police brutality in the first half of 2020, protests and conversations regarding Black Lives Matter took hold over the summer of 2020. When K-12 schools began to embark on a new school year in the fall, many districts throughout the country began placing a stronger emphasis on racial equity in schools. Many districts began to provide teachers and staff with professional development regarding racial equity. One such conversation that emerged as a way to make learning equitable for all students was detracking. Detracking involves scheduling students so that they are in academically heterogeneous classes, instead of dividing students based on skill level (Rubin, 2003). Evidence suggests that when detracking policies are correctly implemented, new academic opportunities are provided for all students (Rubin, 2006). For example, some schools have seen their Regents diploma rates increase from 58% to 96% after detracking courses (Rubin, 2006). However, many school districts are still unclear regarding what is the best way to detrack classes. Research shows that simply providing more choice to students and parents often results in little movement of low- and middle-track students, who are mainly African American and Latino, to high-track classes (Yonezawa et al., 2002). As a result, some districts have started to implement an earned honors approach to learning but are unsure of how to structure the program.

Research is needed that measures how effective earned honors approaches are, and specifically what are the most effective ways to assign earned honors credit within the system. Minimal research exists regarding the effectiveness of earned honors programs. An article published in *Kappan Magazine* in 2016 by the Assistant

Superintendent for Curriculum and Instruction at Evanston Township High School in Evanston, Illinois states that their earned honors program has been effective for them (Bavis, 2016). The first group of students to participate in the earned honors program graduated in 2015 and received the highest average American College Test (ACT) score (23.9) in school history (Bavis, 2016). Additionally, these students went on to take more Advanced Placement (AP) courses than past graduating classes and earn more passing scores on AP exams. It was significant that all subgroups of students saw gains in each of these measures (Bavis, 2016). However, other than individual school districts reporting their findings, no evidence exists to show how effective earned honors programs are or how to structure them. Formal research studies need to be conducted to determine the effectiveness of these programs. In order to conduct this research, a full earned honors program needs to be instituted in a school, and students need to be monitored over the course of their four years in high school, and potentially beyond, to measure the effectiveness of earned honors programs.

However, research is also needed that assesses ways to assign earned honors credit within school systems. No research currently exists that addresses this topic, which is a major concern. With such a deficiency in related research, school districts have no research foundation to base their programs off. As a result, some school districts that are beginning to implement earned honors programs are telling their teachers to figure out themselves how honors credit should be assigned even though larger school-wide systems need to be in place to address these issues. Research on this topic would be helpful for school administrators, teachers, students, parents/guardians, and other stakeholders to know that earned honors programs are being constructed in a manner that

is fair for all students. This research study aims to fill the gap by evaluating the effectiveness of different types of assessment methods at assessing higher level cognitive processes which can be used to assign honors credit in an earned honors geography classroom.

LITERATURE REVIEW

Detracking

Beginning in the 1930s, students were placed in high, middle, or low tracks (National Association of Secondary School Principals, 2020). The purpose behind the creation of these tracks was so that each student would be provided with a more tailored educational experience (Rubin, 2006). It was believed that all students would benefit from this tracked system of classes. However, in the years since, it has become clear that not all students benefit from tracking in the American school system. Curriculum polarization, in which high-tracked students are forced to move through content rapidly and low-tracked students experience restrictions to their opportunities to learn, leads to all students being dissatisfied with their learning experiences (Rubin, 2006). Additionally, social interactions in the classroom are also negatively affected by tracking (Rubin, 2006, 5). Consequently, students in the lower tracks are often demoralized and demotivated. Specifically for students assigned to the low-track, they often score lower on standardized tests than if they had been placed in mixed or high-ability groups (Hallinan & Kubitschek, 1999). Many researchers argue today that tracking is inherently unfair to students and increases inequities within our society (Slavin, 1995).

Some school districts in recent years have begun to detrack their classes. These detracking practices have been met with varying degrees of success, based on the way the district goes about the process. For example, South Side High School in Rockville Center, New York has seen great success after detracking all their courses. South Side began the process of detracking in the mid 1990s (Strauss, 2016). All students in the feeder middle schools began to take the same accelerated mathematics course sequence

during this time. South Side ensured that expectations were never lowered for students. Instead, support systems were created so that all students would be able to find success with these higher expectations. All students at South Side High School take the former honors curriculum. In addition to 71% of all low-income students passing the state's Regents exam (from previously 22%), the overall Regents diploma rate increased from 58% to 96% (Garrity, 2004). For the 2014-15 school year, 88% of all students graduating from South Side took at least one or more International Baccalaureate (IB) or AP exams. This statistic includes 70% of students who qualified for free or reduced lunch, 72% of all black and Hispanic students, and 60% of students with disabilities (Strauss, 2016). South Side High has seen students become more successful after instituting a program of detracking.

On the other hand, some detracking practices have proven to be ineffective. Some school districts have provided students and parents with freedom to choose the tracked level students would like to be placed on. The potential class levels are explained to students and families, and then students are allowed to choose which courses they would like to take. However, research shows that the low and middle track students, who are predominately African American and Latino, often are resistant to enrolling in high track classes (Yonezawa et al., 2002). Some of the reasons behind their decision to remain in the lower tracks include hidden institutional barriers within schools, students' aspirations being tracked, and students desiring to learn in "places of respect", or classrooms where students are not racially isolated and where they feel that their cultural experiences are valued (Yonezawa et al., 2002). School districts throughout the US recognize that research shows that tracking is harmful to all students, but they are still working to find

effective solutions to detracking.

Earned Honors

One system some school districts have transitioned to in the name of detracking is earned honors. Earned honors is when all students are presented with rigorous instruction and have the opportunity to earn honors credit at the end of a course by meeting some predetermined criteria (Madison Metropolitan School District, 2021). This is different from an embedded honors course, which is often when students choose to do extra work and explore class content in greater depth to earn honors credit (Madison Metropolitan School District, 2021). Today, schools are working to provide heterogeneous grouping for students. Heterogeneous grouping has proven to not only benefit struggling learners but also adequately serve gifted learners (Nuremburg, 2016). Some schools have instituted an earned honors or embedded honors approach to create heterogeneous classes. In both types of honors class, students of all readiness levels are in the same classroom. In that class setting, all students are eligible to complete honors work to earn the honors distinction for the course. In an embedded honors course, honors assignments typically have content that is either broader in scope or deeper in the examination of the subject (Nuremburg, 2016).

There are some examples of schools that have implemented earned honors structures. Rolling Meadows High School, located in the Chicago suburbs, instituted an earned honors structure for the 2021-22 school year in several freshmen courses. In one example, students completed a lesson on sexual reproduction in their biology class (Eubanks et al., 2022). The learning objective for the lesson stated students would be able

to explain how meiosis can result in genetic variation. Students first completed a guided note sheet with their teacher and then completed a group activity to apply the information. At that point, students had the opportunity to choose if they wanted to complete a review activity or an explore activity. The review activity consisted of students completing a reading and questions on an overview of meiosis. Meanwhile, students who wanted to challenge themselves completed the explore activity. The explore activity was a meiosis model analysis in which students had to learn more in-depth about the topic. Students who completed the explore activity were eligible to potentially earn honors credit. This model shows how honors work typically addresses more sophisticated questions and satisfies more rigorous standards. Honors work is not just extra work (Nuremburg, 2016). This idea is exemplified in Rolling Meadow's structure of their program. All students had to choose an assignment to complete. They could choose between reviewing the information further, if that is what they needed, or challenging themselves with an explore activity. However, since this is the first year that Rolling Meadows has implemented an earned honors system, they do not have data yet that can be used to determine how effective their structure is.

While schools have started to implement these policies, there is little to no research on how to assign honors credit in an earned honors system. Some schools assign their honors credit based on scores from standardized style tests, though this is met with mixed results if that is the best way to measure honors-level work (Bavis, 2016/2017). Some assign credit based on demonstration of leadership qualities in the earned honors classroom (Bow High School, *Honors by exhibition*). Some schools assign honors credit based on students completing an additional project. Harvest Collegiate High School in

New York City requires all classes to have an open honors component that students can choose to complete (Potter, 2019). Some of examples of open honors work include developing math functions that can be used to advocate for a public policy the student is interested in, serving as a peer tutor in an English class, or researching an additional historical event for a history class (Potter, 2019). High Tech High in San Diego, California also uses an open honors model through their project-based learning methods (Potter, 2019). While it is stated that as many as 70% of all juniors and seniors take at least one honors class, it is not clear how that honors distinction is earned. No educational research exists that attempts to determine what the best way is to assign honors credit to students in an earned honors class.

Higher Level Thinking

Teaching for concepts, not mere facts, is very important for developing student thinking skills in a geography class. In order for students to be able to develop higher level thinking, students need to be able to not only understand a topic but also be able to use their knowledge and skills acquired in more complex ways (Brookhart, 2010). This is referred to as teaching for transfer or teaching for meaning. Teaching for concepts is important because geography teachers want students to understand and be able to use spatial patterns, diffusion, human-environment interaction, and other topics. However, for any geographic concepts, teachers want students to not only know the facts but also be able to think and reason with those newly acquired facts in more complex ways (Brookhart, 2010). These skills will help students be successful in other courses in high school and also in any future endeavors after graduation.

While there are a number of different taxonomies used in education, Bloom's taxonomy is the most widely used (Krathwohl, 2002). Bloom created a hierarchical listing of thinking in which six cognitive levels were measured (Muhayimana et al., 2022). Over time, Bloom's taxonomy has been used in education to assess languages, student learning outcomes, exam questions, school workbooks, school textbooks and more (Muhayimana et al., 2022). In 2002, Krathwohl revived Bloom's initial taxonomy. Krathwohl used nouns and verbs to create a two-dimensional framework: knowledge and cognitive processes (Krathwohl, 2002). Krathwohl used a noun to provide the basis for the knowledge dimension and a verb for the cognitive process dimension. Krathwohl removed the "synthesis" category and replaced it with "create" as the highest category (Krathwohl, 2002). The six categories can be broken down into lower level cognitive processes, including *remembering*, *understanding*, *applying*, and higher level cognitive processes, such as *analyzing*, *evaluating* and *creating*. The revised Bloom's taxonomy has also been used for multiple purposes in educational research. The revised taxonomy has been used to assess language learning, English curricula, and many other aspects of education (Muhayimana et al., 2022, 4). Furthermore, the revised Bloom's taxonomy has been deemed essential for writing high-quality examination questions that test various cognitive skills (Muhayimana et al., 2022).

One of the key goals in education is that students will be able to work their way up Bloom's taxonomy to the *evaluate* and *create* levels (Brookhart, 2010). This is also the goal of an earned honors geography curriculum. In order to earn honors credit, students should be able to demonstrate higher level cognitive processes. The question then is how to assess learning through Bloom's taxonomy. Previously it has been

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believed that multiple choice questions (MCQs) are invalid at measuring the higher level cognitive skills of *apply*, *analyze* and *evaluate*. However, some studies have shown this to be false.

A study conducted in engineering classes in Oman shows that multiple choice questions can assess higher level cognitive processes when the foundation of the MCQ is developed as a task or scenario (Lenchuk and Ahmed, 2021). Oman is working to develop students with comprehensive qualifications and higher level cognitive processes as part of Oman Vision 2040, which is a plan to overcome challenges, keep pace with regional and global changes, and increase the standard of living in Oman. In order to do this, educational researchers needed to determine whether MCQs are a valid assessment of higher level cognitive processes. As the use of MCQs became more prevalent during the COVID-19 pandemic when most instruction was limited to online learning management systems, researchers decided to study the effectiveness of this assessment method. For this study, students were given an online quiz that served as a formative assessment measuring student progress in an engineering course. Each question was coded for the level of Bloom's taxonomy it targeted. Another instructor verified the codes to ensure reliability. The average scores of the questions that reflected the same level of Bloom's taxonomy were calculated and compared to determine which levels of the taxonomy were most challenging for the students. The results found that while overall students performed better on the simple *recall* MCQs, this is not surprising as most of the time students are merely asked to *remember* information for MCQ assessments. MCQ assessments can be used as a valid type of assessment that can assess different levels of Bloom's taxonomy (Lenchuk and Ahmed, 2021). However, no research exists that

examines ways that assessments can be used to measure higher level cognitive processes to assign honors credit for a geography course.

Context of the Study

During the 2020-2021 school year, the district I teach in announced that some schools were going to begin the process of detracking by implementing an earned honors system over the next few years. Whereas previously freshmen were placed into a self-contained (special education) level, prep-level, general-level, or AP-level human geography course, now only the self-contained level and an earned honors level would exist. This meant that one classroom would now comprise students from previously three different leveled courses. While the directive to begin this program was issued from the district, little to no guidance was provided as to how to structure these courses, how to differentiate for the needs of a wide variety of skill levels, or how to assign honors credit to students. Therefore, I conducted research in my current human geography courses in an attempt to gather data on how I would be able to use various assessment methods to assign honors credit in my future earned honors geography courses. This study is directly related to my current position as a human geography teacher and professional learning community (PLC) leader, and I will be using the findings to help my school structure our earned honors program for all incoming freshmen students.

Summary

For many years, students were placed into tracks based on their skills levels. Students learned in homogeneous classrooms in which all students were similar to them

in terms of reading levels, critical thinking skills and other measures. However, educational researchers began to uncover that tracking was not the best way to organize students into classes. All groups of students benefitted negatively. Today, some school districts around the United States are detracking their students. Students are being placed in heterogeneous courses with students who are similar and different from themselves. So far, detracking has been met with mixed results. In schools like South Side High School in New York, low-income students are showing more success in school. However, in some school districts, students choose to continue taking classes in the same level in which they were previously tracked, even when given the opportunity to take more challenging courses.

One educational system that is being instituted along with detracking is earned honors. In an earned honors class, all students are taught in the same classroom, and the teacher holds all students to high expectations. All students are eligible to earn honors credit if they meet specified requirements. The problem is that no educational research exists that examines how honors credit should be earned and then awarded to students. Therefore, this study attempts to determine how different assessments designed to measure higher level cognitive processes can be used for this purpose. The most commonly used taxonomy for critical thinking skills is Bloom's taxonomy, which is what is used in this research. The goal of earned honors is for students to be able to demonstrate mastery of higher level cognitive processes in their coursework. Specifically, based on Krathwohl's revised taxonomy, students should be able to demonstrate mastery of the *evaluate* and *create* levels. Some studies have shown that multiple choice questions can be used to assess different levels of Bloom's taxonomy, but no research exists that

specifically examines what types of assessments are most effective at differentiating student cognitive skills. Research needs to be conducted that specifically analyzes different types of assessment methods and determines which assessment methods effectively differentiate between lower and higher level cognitive processes so that teachers can know what types of assessments to use in their courses to assigned earned honors credit to students.

RESEARCH QUESTIONS

This research aims to address two questions related to assessment methods that can be used to assign honors credit in a geography course that is following an earned honors structure. First, what levels of cognitive skills are students able to demonstrate mastery of on multiple choice, short answer and extended writing questions when all three assessment methods provide them with the opportunity to demonstrate mastery of both lower and higher level cognitive processing? Second, are extended writing questions more effective than multiple choice questions and short answer questions at differentiating between students demonstrating mastery of lower and higher level cognitive processes versus students demonstrating only lower level cognitive processes? My hypothesis is that the extended writing questions will provide the clearest differentiation between students who are able to demonstrate mastery of lower level cognitive skills only versus students who are able to demonstrate mastery of both lower and higher level cognitive processes. My prediction is that the multiple choice questions and short answer questions will provide more mixed results as to which students can clearly demonstrate mastery of lower and higher levels of thinking, which would make these assessment methods not as effective at assigning earned honors credit.

METHODOLOGY

Participants

The participants for this research study are 9th grade students enrolled in an AP Human Geography course at Wheeling High School in Wheeling, Illinois. All students are 14-16 years old. All students enrolled in the course were eligible to participate in the study. An email was sent to students, parents and guardians explaining the study and giving students the opportunity to opt-out if desired. Every student who wanted to participate in the research study was selected to do so. 75 students participated in the study. 38 participants were male and 37 were female. Students came from diverse racial/ethnic backgrounds. 34 students, about 45%, identified as Hispanic/Latino. 29 students, about 39%, identified as white. 9 students, about 12%, identified as Asian or Pacific Islander. 3 students, about 4%, identified as Black or African American. Students participating in this study came from three different middle schools in the surrounding area, but the social science curriculums at each of those schools provided students with minimal geography background knowledge before taking this course. All students had been in their freshmen year human geography course for eight months at the time when the research was conducted. The approval of the institutional review board (IRB) for the protection of human subjects at Texas State University was obtained for this study on January 19th, 2022 (IRB #8031).

Instruments

Two instruments were developed and used for the study in this experiment. Assessment A consisted of five multiple choice questions and four short answer

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questions. Students were expected to write several complete sentences for each of the written questions. Assessment B consisted of four extended writing questions. Students were expected to write a paragraph (4-6 sentences) for each. Figure 1 and Figure 2 show example questions from Assessment A and Assessment B respectively.

Q. What is the SNAP Program (Supplemental Nutrition Assistance Program) formerly known as?
    a. Medicaid
    b. Social Security
    c. Food Stamps
    d. Grocery Vouchers

Q. Which of the following is NOT one of the top ten sources of calories for low-income individuals?
    a. Sodas, energy drinks, sports drinks
    b. Fruits and vegetables
    c. Pizza
    d. Chicken dishes
    e. Tortillas, burritos, tacos

Q. What does it mean to be food insecure?

Q. Explain the correlation between food insecurity and obesity.

Figure 1. Sample Multiple Choice Questions & Short Answer Questions in Assessment A

Q. What is a potential solution that could be used to solve this problem [hunger]?

Q. What are some consequences and implications of your proposed solution and this problem as a whole?

Figure 2. Sample Extended Writing Questions in Assessment B

The assessment questions are based on a 2014 *National Geographic* article titled "The New Face of Hunger." The article discusses the concept of food insecurity and

explains how hunger is changing in the United States (McMillan, 2014). A number of students participating in the study and their families qualify for the free and reduced-price meal program, so this lesson topic in particular was relevant to the students' personal lives. All students read the article and then completed both Assessment A and Assessment B.

The main difference between the two assessments is the length of the response required for the written questions. These different assessments were designed to determine if extended writing questions are better than short answer questions and multiple choice questions at differentiating between student mastery of lower level cognitive processes only as opposed to mastery of both lower and higher level cognitive thinking as exhibited by students in a geography course. Therefore, Assessment A contained the multiple choice and short answer questions (Appendix 1). Assessment B contained the extended writing questions (Appendix 2).

The process of and the rationales for designing these two assessments is as follows. First, each of the three types of assessment questions (multiple choice, short answer and extended writing) needed to include questions that can assess both lower and higher level cognitive processes according to Krathwohl's revised version of Bloom's taxonomy. It was important to include questions that were similar enough in the cognitive skills that were being assessed so that the results could be comparable while ensuring the questions were also different enough to determine which assessment method best differentiates between students who show mastery of lower and higher level cognitive skills.

For Assessment A, five multiple choice questions and four short answer questions

were created to evaluate student mastery of various levels of cognitive processes. Among the five multiple choice questions, four questions were to assess relatively lower level cognitive processes, two *remember* questions and two *understand* questions, and one *apply* question was to assess higher level cognitive processes (Appendix 1). The answers to the multiple choice questions can be found at various positions within the *National Geographic* article, so students needed to read the entire article to be able to complete the questions. The short answer questions were also created so that they can assess student mastery of both lower and higher level cognitive skills. Students were instructed to write several complete sentences for these questions. The short answer portion of the assessment contained one *remember* question and one *understand* question designed to assess relatively lower level cognitive skills, as well as one *apply* question and one *create* question designed to assess higher level cognitive skills (Appendix 1). The short answer questions required students to not only answer the questions based on the text in the article, but one of the questions also required students to analyze a map and make their own interpretations, which is an important skill in a geography course.

Assessment B was created in a similar way. For this assessment, it was also important to include questions that assessed student mastery of both lower and higher level cognitive processes. Assessment B consisted of four extended writing questions. Students were instructed to write a paragraph, about 4-6 complete sentences for each. For Assessment B, there was one *understand* question to assess lower level cognitive processes and two *evaluate* questions and one *create* question to assess mastery of higher level cognitive processes (Appendix 2). For some of these extended writing questions, students were expected to include evidence from the article to support their responses.

Design and Procedures

This research is a pre-experimental design that follows a within-group design. In a pre-experimental design, the researcher studies a single group instead having a control group and an experimental group. For that single group, an intervention is implemented during the experiment (Creswell and Creswell, 2018). In this study, all students received the same instruction and then completed both Assessment A and B. The intervention was the different assessment methods students were given. The data was collected from all students on each assessment. In this experiment, the ability of each assessment method to differentiate between students demonstrating mastery of lower and higher level cognitive processes is what is being compared. The independent variable is the assessment form, while the dependent variable is the level of cognition demonstrated in the student responses.

When students walked into the classroom, the daily agenda was posted on the board. The class read through the learning objective of the day and the agenda. Students were then instructed that they had 20 minutes to read "The New Face of Hunger" article from *National Geographic* (McMillan, 2014). Students had already been introduced to the concept of food insecurity and food deserts in their reading for homework a few days prior, but the concepts had not been discussed during class time. Students were encouraged to read the article in whatever format they preferred. This meant students could annotate if they desired or simply just read the article. Students were also able to use the text-to-speech function on their iPads to have the article read aloud to them, if preferred.

After reading the article, students then had 25 minutes to complete Assessment A.

The only instruction provided to students were the directions written on the assessment. Students were encouraged to spend the entire time working on Assessment A. They were told they could not take out other work or use electronics until the time was up in order to encourage them to take their time on the assessment. Following the completion of Assessment A, all students had a five minute break. Students then had 35 minutes to complete Assessment B. Similarly to Assessment A, the only instructions given to students were the directions printed on the assessment. Again, students were encouraged to use the entire time to produce their best work. Most students were able to finish both Assessment A and B during the assigned time period. Students who receive extended time on assessments were able to finish during their resource period with a study hall teacher or case manager.

Data Collection and Analysis

75 students completed both Assessment A and Assessment B as part of this study. Assessment A consisted of two different types of responses being collected. The first five questions were multiple choice questions, so students selected one of the four potential answer choices for each of those questions. The second part of Assessment A consisted of four short answer questions, so those responses were each several sentences long. Assessment B consisted of only extended writing questions, so those responses were each short paragraphs.

Each question on both Assessment A and Assessment B was aligned with one of the levels of Krathwohl's revised version of Bloom's taxonomy (*remember*, *understand*, *apply*, *analyze*, *evaluate* and *create*). After students completed both assessments, each

response was scored individually by the teacher using the Assessment A and B rubrics. The multiple choice questions for Assessment A were marked as either correct or incorrect. The short answer written responses in Assessment A were evaluated using the rubric on a scale from one to three (one being the lowest and three being the highest score) (Appendix 3). The extended writing questions in Assessment B were also scored using the rubric on a scale from one to four (one being the lowest and four being the highest) (Appendix 4). Students did not have access to view these rubrics while they were completing the assessments.

After the assessments were scored, each student response was reviewed to determine the degree of mastery regarding the level of cognition indicated on each question. For Assessment A, students' responses were classified as demonstrating mastery of the level of cognition on the MCQs if their answer was correct. For the short answer questions on Assessment A, scores in each category (one to three) represented a different level of mastery of the cognitive skill (Appendix 3). A score of one indicated the student's response did not demonstrate mastery of that skill. A score of two indicated the student's response had basic mastery of the skill and was meeting grade level expectations for that skill. A score of three indicated that a student's response had exceeded grade level expectations for mastery of that skill. Earning a three on these questions indicated a potential of earning honors credit. Table 1 shows the short answer questions rubric and examples of student responses.

Table 1. Short Answer Questions Rubric & Sample Student Responses

	Scored 3	Scored 2	Scored 1
What does it mean to be food insecure? [remember]	-Detailed and accurate explanation of food insecurity is provided	-Brief and accurate explanation of food insecurity is provided	-Brief explanation of food insecurity is provided

Sample student responses for each score category	To be food insecure, it does mean you are completely poor with no food. In fact, most people who are food insecure mostly live in suburbs with a house, family, and car, seemingly wealthy. But food insecure means to "describe any household where sometime during the previous year, people didn't have enough food to eat."	To be food insecure it describes a household where sometimes people don't have enough food to eat. People going hungry.	It's basically the same term as "hunger" but changed in 2006 by the U.S. government, meaning that you don't have any food available to you.
Explain the connection between food insecurity and obesity [understand]	-Connection between food insecurity and obesity is stated -Solid explanation is provided regarding connection	-Connection between food insecurity and obesity is stated -Attempt is made at explaining connection	-Connection between food insecurity and obesity is stated
Sample student responses for each score category	Food insecurity directly relates to obesity. Most people who are food insecure are poor. The foods they can usually afford are cheap and processed. The foods they eat are unhealthy, which usually leads them to become obese because their only subsistence are the unhealthy food.	The correlation between food insecurity and obesity is that both being about food. Food insecurity is not having enough food while obesity is not having the right type of food. You can't get the foods you want.	People who are food insecure often do not have access to healthy food, or do not have the time to cook a healthy meal. Often it's convenience over quality.
What can you interpret about hunger in the US from the map? [apply]	-Makes accurate interpretations from the map that reference distribution (density, concentration and pattern)	-Makes accurate interpretations from the map	-Attempts to make interpretations from the data on the map
Sample student responses for each score category	The concentration of people who use SNAP are located in the southern area of the US. To be more precise, a majority of the concentration is located on the Southeastern part of the US. Denser areas (cities) have a high population of SNAP users like the Bronx or Kings.	Two examples of the highest poverty rates, and areas with SNAP dependency, are Indian reservations. Many areas of the South are dependent on SNAP.	I can see that indeed the people who live through hunger are closer to urban areas. Most of the highest percentages are near the coast near Florida.
Make a hypothesis – What can be done to solve this	-Feasible and detailed solution is proposed to solve problem of food insecurity	-Feasible solution is proposed to solve problem of food insecurity	-Potential solution is proposed to solve problem

problem of food insecurity in the United States? [create]			of food insecurity
Sample student responses for each score category	To solve the problem of food insecurity in the U.S., the government should fund more production of fruits and vegetables. The government should also make it easier to access the fruits and vegetables. The government can create programs with tax money to support farmers growing healthier foods.	To better solve this problem is to both decrease the prices for healthier foods so that they're more accessible for low-income populations and increase wages so that these populations have more money and have more food options.	Make better transportation and make it easier and cheaper.

For Assessment B, student responses were classified as demonstrating mastery of the level of cognition on the extended writing questions if the student scored a three or four on the rubric (scores could range from one to four) (Appendix 4). A score of one or two indicated that the student's response did not have a basic mastery of that cognitive skill yet. A score of three indicated that a student's response had basic mastery of the cognitive skill and was meeting grade level expectations for that skill. A score of four indicated that a student's response had exceeded grade level expectations for mastery of that skill. In the four point category, student responses not only demonstrated mastery of the intended level of Bloom's taxonomy but then went beyond that to provide more imaginative solutions, more detailed information, and a more comprehensive analysis. Earning a four on questions in Assessment B demonstrated a student would potentially be eligible to earn honors credit for the course. Table 2 shows the extended writing questions rubric and examples of student responses.

Table 2. Extended Writing Questions Rubric & Sample Student Responses

	Scored 4	Scored 3	Scored 2	Scored 1
Describe the issue(s) discussed in the article. [understand]	-Issue/problem is stated clearly and described comprehensively -All relevant information necessary for full understanding is included	-Issue/problem is thoroughly stated, described and clarified	-Issue/problem is stated and includes clarification and description	-Issue/problem is stated
Sample student responses for each score category	The issue the article talks about is food insecurity. This is the idea that lower income populations, especially, have harder access to healthier foods. This is because of the price difference between healthier foods and unhealthier foods. When healthier foods are more expensive and also harder to access, people who are trying to make ends meet with basic food on their table are going to have even more trouble with these more expensive and healthier ones. This will then cause heart disease because of the high sugar and salt content in unhealthier and cheaper foods.	The issue discussed in the article is the problem of nutrition from easily accessible foods. The foods that food insecure can access are much lower in nutrition. Fresh fruits and vegetables are harder to access. This means the unhealthy food people have access to also encourages obesity and causes other health problems.	People are struggling in suburb areas due to the lack of healthy food. Most areas lack the money to provide healthy foods, so they turn to fast food. They do this because it's faster, people work all day then need food to provide their family. It's an idea that families all over struggle with.	People don't have access to healthy foods or any foods at all.
Justify why hunger is a problem. Provide evidence from the	-Evidence is taken from the source, enough interpretation/ evaluation is included to develop	-Evidence is taken from the source, interpretation/ evaluation is provided in the	-Evidence is taken from the source & some interpretation/ evaluation is included	-Evidence is taken from the source

article to prove why this is an important topic. [evaluate]	a comprehensive analysis	form of a coherent analysis		
Sample student responses for each score category	Hunger is a problem not just because food is a basic necessity but because with limited food, people will turn to processed and unhealthier foods as they are cheaper. When they don't have access to fresh food and their only diet is unhealthy food, this leads to health problems. The article explains that unhealthier foods are high in sugar and salt content which are linked to problems like obesity, heart disease and death. In recent years the problem is worse because veggies and fruit prices increased by 24% and sweetened drinks decreased by 27%. This makes it even harder for lower income people to get healthy foods and stay healthy.	Hunger is a problem because it affects rising numbers of our population. In Europe, about 1 in 20 people report running out of food at some point in the year. That number is 1 in 6 in the U.S. About 48 million people go hungry in the U.S., quintuple the number in the 1960s. Overall, the increasing numbers show that hunger is an issue in the U.S.	Hunger is a huge problem as it is affecting many families (176 million families). 72% of people who need SNAPS are children, disabled or elderly. Hunger is affecting those in need. It's important because most people suffering are those who can't stop/ prevent hunger. They need help and yet they can't provide what their needs want.	Hunger is a problem because without daily consumption of food, we will starve and die.
What is a potential solution that could be used to solve the problem? [create]	-Specific solution is highly imaginative, taking into account the complexities of an issue.	-Specific solution is stated that takes into account the complexities of the issue.	-Specific solution is stated	-Simple or obvious solution is stated
Sample student responses for each score	Creating community gardens could help solve hunger. By growing healthy and	A potential solution to solve this problem is to lower the cost for	Increasing wages and increasing support of	The government can implant more programs

category	fresh produce and distributing them for free, more people have access to healthy food. Communities in turn can grow closer while providing food to everyone. People can learn new skills like gardening, teamwork, and planning. Their new skills can also be used to find higher paying jobs. Easily, a community can help get a community out of poverty.	these expensive healthy foods. By doing this, lower income populations will more easily afford the high costs of these healthier foods. They can buy a mix of healthy and unhealthy and have more options. This can improve their health and make them less likely for diabetes, obesity, heart disease and death.	charities and food pantries. Increased wages would reduce the need for the latter, while increased funding for organizations like SNAP could support more families with higher donations.	that feed low income families and provide healthier foods.
What are some consequences and implications of your proposed solution and this problem as a whole? [evaluate]	-Conclusion is logically tied to a range of information -Consequences and implications are fully identified clearly.	-Conclusion is logically tied to information discussed. -Some related consequences and implications are clearly identified.	-Conclusion is loosely tried to some of the information discussed. -Oversimplified consequences and implications are included.	-Conclusion is attempted.
Sample student responses for each score category	If we gave more money to farmers to grow "specialty crops" it would of course be pretty expensive, but also it would result in a change in the way people farm. Since most of the farming in America goes towards feeding livestock, a shift towards growing more healthy and fresh produce for people would be a big change. Building grocery stores in	Some of the problems with this solution is that if these fruits and vegetables are expensive that will hurt the economy and we do not know if consumers are going to buy enough of these plants and vegetables to offset these costs. Also, we need to make the fresh vegetable and healthier food	Increased wages could lead to inflation which could lead to the economy prospering shortly, and then it would crash. It might affect smaller businesses who rely on lower wages to make a profit. Delegating money to fund food pantries might take away resources from	This solution could raise prices in food sold at grocery stores. This is because the government already providing would want to increase other prices.

	areas with little access to full markets with fresh food wouldn't just make it cheaper and more convenient to eat and buy nutritious meals. It would also create jobs and attract more attention to these areas.	stores closer and more accessible to low income populations so that they not just afford it but can easily get it.	other government programs.

RESULTS

As presented in Table 3, the data shows that students were generally successful at answering multiple choice questions that assessed the *remember* and *apply* levels of Bloom's taxonomy. As captured in Table 3, between 88-96% of students correctly answered the *remember* questions. Additionally, 88% of students answered the *apply* question correctly as well, even though that was a higher level cognitive process. One noticeable result from this data is that students struggled with the two *understand* multiple choice questions, with only 40-48% of students answering those questions correctly. This may have more to do with the fact that these questions were formatted as true or false questions, and were to some extent ambiguous. For example, one of the true/false questions states, "The majority of food insecure families are located in large urban areas." Only 40% of students correctly identified this question as false. The intention was for students to be able to identify this statement as false based on the following statement from the article: "Today hunger in the suburbs is growing faster than in cities, having more than doubled since 2007" (McMillan, 2014, 78). However, after analyzing the results and discussing with students, some of them thought this statement was true based on the fact that there is a proportional symbol map that specifically looks at how many people in the Houston area are considered living in a food desert (McMillan, 2014, 85). Additionally, some students thought this statement was true because the Bronx is one of the areas highlighted on another map as having a very high percentage of population receiving SNAP benefits in 2010 (McMillan, 2014, 86-87). As a result, the data from the MCQs is not as useful for determining to what extent multiple choice questions are effective at differentiating between student mastery of different

cognitive levels. Based on these limited findings, it seems that multiple choice questions could potentially be used in an earned honors classroom to assign honors credit, but more research needs to be conducted on this topic.

Table 3. Assessment A Data – Multiple Choice Questions

Question	# of students who got the question correct or incorrect (%)
1. Remember	Correct: 72 (96%) Incorrect: 3 (4%)
2. Understand	Correct: 36 (48%) Incorrect: 39 (52%)
3. Remember	Correct: 66 (88%) Incorrect: 9 (12%)
4. Understand	Correct: 30 (40%) Incorrect: 45 (60%)
5. Apply	Correct: 66 (88%) Incorrect: 9 (12%)

As captured in Table 4, the data shows that the short answer questions do clearly differentiate between the students who might be eligible to earn honors credit and those who are not. The short answer questions were able to differentiate between students who were able to meet the grade level expectations for each skill and students that were not only meeting the baseline expectations but going above and beyond. The results show that the short answer questions were able to differentiate between which students demonstrated mastery of lower level cognitive processes and which students demonstrated mastery of lower and high level cognitive processes, which is what is required to earn honors credit. The data shows that by demonstrating mastery of the higher levels of Bloom's taxonomy, fewer students were producing work at the honors level than the number of students producing work that meets grade level expectations. For example, 48% of students' responses demonstrated mastery of the lower level

cognitive processes (*remember* and *understand*). Meanwhile, 24-28% of students'

responses demonstrated mastery of both the lower level and higher level cognitive

processes (*apply* and *create*) as tested in the short answer questions. This data shows that

short answer questions could be a valuable way to assess students in an earned honors

classroom in order to help educators determine who should earn honors credit because

these questions clearly differentiate between which students have demonstrated mastery

of lower and higher level cognitive processes.

Table 4. Assessment A Data – Short Answer Questions

Question	# of students who earned each score	% of students earning honors credit vs. grade level mastery
6. Remember	Score of 3: 36 Score of 2: 18 Score of 1: 21	Earning Honors Credit (score of 3) = 48% Basic Mastery of Skill (score of 2 or 3) = 72%
7. Understand	Score of 3: 36 Score of 2: 21 Score of 1: 18	Earning Honors Credit (score of 3) = 48% Basic Mastery of Skill (score of 2 or 3) = 76%
8. Apply	Score of 3: 21 Score of 2: 45 Score of 1: 9	Earning Honors Credit (score of 3) = 28% Basic Mastery of Skill (score of 2 or 3) =88%
9. Create	Score of 3: 18 Score of 2: 24 Score of 1: 33	Earning Honors Credit (score of 3) = 24% Basic Mastery of Skill (score of 2 or 3) = 56%

As captured in Table 5, the extended writing questions provided similar results to

the short answer questions in some ways. Generally, a larger proportion of students met

grade level expectations for the lower level cognitive question (*understand*), with 48% at

grade level and 28% demonstrating honors level work, than for the higher level

questions. For one of the *evaluate* questions and the *create* question, both of which are

higher level cognitive processes, between 24-36% of students' responses met grade level

expectations. Meanwhile, much smaller percentages of those same student responses (4-

8%) indicated mastery that would represent honors level work, which means according to the data from the extended writing questions significantly less students would be able to earn honors credit in comparison to the short answer questions. Furthermore, the data from one of the *evaluate* questions does not align with the findings that students demonstrate mastery of lower level cognitive processes first and then mastery of higher level cognitive processes. Even though *evaluate* is a higher level cognitive process, relatively high percentages of student responses indicated grade level proficiency and honors level work, at 64% and 24% respectively, on this particular question when compared to the other higher and lower level cognitive processing questions. Additionally, some students demonstrated mastery of the *evaluate* question, a higher level cognitive process, but not the *understand* question, a lower level cognitive process. This data shows that while there is a potential for extended writing questions to be used to assess honors level work in an earned honors geography classroom, the results are not as straightforward as the short answer questions. Extended writing questions cannot be used as easily as the short answer questions to differentiate between which students are demonstrating mastery of higher level cognitive processes, which in turn could lead to earning honors credit. More research needs to be done about the potential use of extended writing questions being used to assign honors credit in an earned honors geography classroom.

Table 5: Assessment B Data – Extended Writing Questions

Question	# of students who earned each score	% of students earning honors credit vs. grade level mastery
1. Understand	Score of 4: 21 Score of 3: 33	Earning Honors Credit (score of 4) = 28% Basic Mastery of Skill (score of 3 or 4) = 48%

	Score of 2: 15 Score of 1: 6	
2. Evaluate	Score of 4: 18 Score of 3: 21 Score of 2: 30 Score of 1: 6	Earning Honors Credit (score of 4) = 24% Basic Mastery of Skill (score of 3 or 4) = 64%
3. Create	Score of 4: 3 Score of 3: 21 Score of 2: 15 Score of 1: 36	Earning Honors Credit (score of 4) = 4% Basic Mastery of Skill (score of 3 or 4) = 24%
4. Evaluate	Score of 4: 6 Score of 3: 30 Score of 2: 21 Score of 1: 18	Earning Honors Credit (score of 4) = 8% Basic Mastery of Skill (score of 3 or 4) = 36%

DISCUSSION

Based on the results, the original hypothesis is partly supported. The extended writing questions did differentiate between students demonstrating mastery of lower and higher level cognitive processes, but the overall percentages of students who demonstrated mastery of the higher level cognitive processes, which signifies honors level work, was significantly low (between 4-8%). According to Rolling Meadows High School, on average 35% of freshmen students earned honors credit in the fall semesters of 2018, 2019 and 2020 when students were tracked into general or honors level courses (Eubanks et al., 2022). When they instituted their earned honors program, 50% of students earned honors credit in fall 2021, their first semester with the earned honors program (Eubanks et al., 2022). Based on this data, typically more than 4-8% of students should be earning honors credit for their work. It can be inferred that the extended writing questions and corresponding rubrics may have been too challenging. Additionally, the results for the two *evaluate* questions were vastly different from one another. Some students also demonstrated mastery of some higher level cognitive processes but not the lower level cognitive processes. There is potential for using extended writing questions to differentiate between students who have demonstrated honors level work, but more research needs to be conducted to determine their effectiveness.

The multiple choice questions, as written and assessed in this research, were not very effective at differentiating between students demonstrating mastery of lower level cognitive processes versus demonstrating mastery of lower and higher level cognitive processes. This does support the original hypothesis. Most students answered both *remember* questions and the *apply* question correctly, but over half the students did not

answer either of the *understand* questions correctly. Theoretically, students would be able to answer the *remember* and *understand* questions before the *apply* question because *remember* and *understand* are lower level cognitive processes that come before *apply* according to Bloom's taxonomy. Therefore, the part of the hypothesis that predicted MCQs would provide mixed results as to which students can clearly demonstrate mastery of different levels of cognitive thinking was supported. This may be due to the way some questions were worded, so more research should be done to measure the effectiveness of using multiple choice questions in future earned honors settings.

It was the short answer questions that showed the most straight-forward way to differentiate between students' responses demonstrating grade level skills (lower level cognitive processes) and honors level skills (higher level cognitive processes). With about half of students demonstrating mastery of the lower level cognitive skills and about one-quarter of students demonstrating mastery of the higher level cognitive skills, short answer questions prove to be an effective way to differentiate between students who are eligible to earn honors credit and those who are not. Therefore, the results suggest that short answer questions developed in this study are more effective than multiple choice or extended writing questions at differentiating between which students should earn honors credit. This contradicts the hypothesis.

The first research question asked what levels of cognitive skills are students able to demonstrate mastery of on multiple choice questions, short answer questions and extended writing questions when all three assessment methods provide students the opportunity to demonstrate mastery of both lower and higher level cognitive processing. The answer to this question is that each assessment method can assess varied levels of

mastery of cognitive skills. The MCQs showed that students were able to demonstrate the skills of *remember* and *apply*, but they struggled with *understand*. This means students demonstrated mastery of some low level cognitive processes successfully and struggled with others. Additionally, on the MCQs, students were successful at demonstrating mastery of the high level processes assessed. For the short answer questions, students successfully answered the *remember*, *understand* and *apply* questions. However, more struggled with the *create* question. This shows that while many students demonstrated mastery of lower level cognitive processes, more students struggled showing mastery of higher level cognitive processes. On the extended writing questions, student responses only indicate mastery of one *evaluate* question, which is a higher level process. Meanwhile, students appeared to struggle with the *understand*, *create* and other *evaluate* questions, which are a mixture of both high and low level processes.

The second research question asked if extended writing questions were more effective than multiple choice questions and short answer questions at differentiating between students demonstrating mastery of lower and higher level cognitive processes versus students demonstrating only lower level cognitive processes. Overall, the multiple choice and extended writing questions show a mixture of student mastery with regards to both low and high level cognitive processes. Not all lower level cognitive processes were mastered and some higher level cognitive processes were mastered even when the lower level ones were not. These findings are somewhat confusing and more research needs to be done to determine the effectiveness of these assessments for assigning earned honors credit in geography classes. The student responses from the short answer questions indicated a clearer mastery of all lower level questions for many students and then some

students continued on to show mastery of higher level processes as well. Based on these findings, the short answer questions are more effective than the multiple choice or extended writing questions at differentiating between students demonstrating mastery of various levels of cognitive processes.

The results from this study are significant because prior to this study, no research existed that attempted to find effective ways to assess students' mastery of cognitive processes to assign credit in an earned honors classroom. Even for schools that claim their earned honors programs are successful, such as Evanston Township High School District (Bavis, 2016), they have not shared any details about how students are assessed or what their raw data looks like. This study is hopefully just a first step towards educational researchers conducting studies to determine what will be an effective way to run earned honors programs, rather than school districts just instituting an earned honors program because it is equitable with no real data or plans of action to follow.

While this study is an important first step in a field that no research exists in, there are several important implications that can be learned from this study for future researchers. If an educational researcher were to continue this research, it would be important to make some changes to the methodology of this study. When creating the multiple choice, short answer and extended writing questions, it would be important to have input from other teachers of geography. Upon reflection, part of the reason that the data might be confusing at times regarding the multiple choice questions is because both understand questions were structured as true/false questions. Technically, these are not multiple choice questions at all. By having other educators, or outside consultants, working to create questions, better questions could be created for all three categories

(multiple choice, short answer, and extended writing).

Additionally, another important implication is that it is essential to have other educators, researchers or consultants work to code the questions used according to their level of Bloom's taxonomy. Some of the data did not seem to fit, and this could partially be due to the fact that only one educator created the questions and aligned their placement within Bloom's taxonomy. In order to have an effective research study that demonstrates both reliability and validity, it would be essential to have others corroborate the classifications of the questions within the taxonomy. It would also be important to include the same number of lower versus higher level cognitive questions for each of the three types of assessments. The multiple choice questions had more lower level questions and the extended writing questions had more higher level questions. By conducting a similar experiment with the same numbers of questions, the results could more easily be compared among assessment types.

Furthermore, another important implication is that rather than following a pre-experimental design in which all students completed both Assessment A and Assessment B, a true experiment in which the researcher randomly assigns the participants to treatment groups may have been more effective and led to clearer results. While the hypothesis was that the extended writing questions would provide the clearest differentiation between students who are able to demonstrate different levels of cognitive processes, the short answer questions proved to more accurately differentiate between general level and honors level work. Part of the reason this might be the case is because all students completed both Assessment A and Assessment B, and they completed them both in the same class period. All students completed assessment A first, which consisted

of the multiple choice and short answer questions, and then completed assessment B, which contained the extended writing questions. There is a possibility that some students may have been burnt out from assessing on the same topic by the time they got to completing Assessment B. As a result, they may have put less effort into the extended writing questions than they normally would. This could have impacted the results. Therefore, it would be impactful for an educational researcher to conduct a study focusing on the same general idea but assigning students to a control group and an experimental group. All students would then complete the assessment being more refreshed, and the data and results might be more reliable.

IMPLICATIONS

While the findings from this research begin to explore the idea of using assessment methods to assign earned honors credit in a geography class, there are some aspects regarding the research conducted that are not addressed in the research questions or findings but would be valuable to explore in the future.

To begin with, it would be important to break down the results by racial/ethnic background, socioeconomic status, and gender. Based on data from the National Assessment of Educational Progress (NAEP), it is clear that an achievement gap exists among students in geography education. Average scale scores for grade 8 students when broken down by race/ethnicity show that higher percentages of white students demonstrate proficiency on various parts of the NAEP geography assessment in comparison to Black and Hispanic students, along with other minorities (Solem, 2022). Additionally, students who are eligible for the National School Lunch Program (NSLP) on average score lower than their racial/ethnic counterparts who do not qualify for the program (Solem, 2022). Therefore, while we know this achievement gap exists, breaking down the results from this research study by student group would make it possible to compare the results by race/ethnicity, socioeconomic status and gender. It would be interesting to see if a transition to an earned honors structure and using the assessment methods as outlined in this research would help to close that achievement gap for students based on race/ethnic background, socioeconomic status and gender.

Furthermore, it would also be important to explore other ways these assessment methods can be used in an earned honors geography classroom. While in this study, MCQs, short answer, and extended writing questions are being used as a summative

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assessment to assign honors credit, there are also ways these assessment methods could be used to help students improve their cognitive processing skills. These assessment methods can also be used throughout the school year as a formative assessment method. This would provide educators and students with checkpoints for students to see how they are doing in terms of demonstrating proficiency of various cognitive processes. Not only would students be able to track their progress, but teachers would also be able to use the results to determine what individualized supports students' need in order to improve in the development of their cognitive processing skills. These assessment methods can be used to assign earned honors credit, but they can also be used to help students improve their cognitive processing skill development throughout a geography course.

CONCLUSIONS

This research aims to find ways to differentiate between honors level students and non-honors level students using different methods to assess various levels of cognitive processes, which can in turn be used to assign honors credit in an earned honors geography classroom. The different types of assessment methods used, multiple choice, short answer and extended writing, all yielded different results. The multiple choice and extended writing questions demonstrated that students were able to show mastery of some lower and some higher level processes, but the results were mixed. Some students demonstrated mastery of higher level cognitive processes but not lower level cognitive processes, which contradicts what Bloom's taxonomy reveals about student learning. Meanwhile, the short answer questions developed in the study were seemingly more effective at accurately measuring cognitive processes and differentiating between honors students and non-honors students. A majority of student responses indicated mastery of the low level cognitive processes, while a mixed proportion of student responses indicated mastery of the high level cognitive processes. These findings show that the short answer questions are more effective at differentiating between students demonstrating mastery of lower and higher level cognitive processes than the multiple choice or extended writing questions. Based on these findings, short answer questions are the best assessment to use when assigning honors credit in an earned honors geography classroom.

While these findings can be used to help educators make decisions about assigning honors credit for students, there are some limitations to this study. This study is not largely generalizable for several reasons. First, this research was conducted with a

small sample size. Only 75 students participated in the study. Additionally, the study did not use a representative sample. In order for these findings to be more generalizable, a similar study would need to be replicated with more students and students from different educational settings (school districts, states, etc.). Second, these findings come from a research study with a small number of questions that students were assessed on. In order for these findings to be more generalizable, more questions (or different sets of questions on different topics) would need to be used in the study.

Overall, this study is just a tiny step in the direction of conducting educational research on the topic of earned honors classes. This research study focused solely on how to assign honors credit in a geography classroom. However, the findings from this study could be applied to any content area. Other disciplines would want to conduct their own research to see how the findings are similar or different, but this data can serve as a significant starting point for any discipline that wants to research more about earned honors. While the earned honors initiative is an important step towards making education equitable for all students in the United States, it is only fair to all students that educators conduct more research on this topic to ensure that earned honors classes are structured in a way that is proven to be effective and fair at assessing the ability of all students.

APPENDICES

Appendix 1

Assessment A

Directions: Read the "New Face of Hunger" National Geographic article posted on Schoology. Then complete the following questions.

Part 1: Complete the following multiple choice questions.

1. What is the SNAP Program (Supplemental Nutrition Assistance Program) formerly known as?
   a. Medicaid
   b. Social Security
   c. Food Stamps
   d. Grocery Vouchers

2. The SNAP program makes it easy for families to purchase healthy produce (such as fruit and vegetables).
   a. True
   b. False

3. What is a food desert?
   a. An area in which people live with few or no-service grocery stores that are easily accessible.
   b. An area of the US where the climate prevents crops from being able to grow.
   c. An area of the country where no farmers are interested in working in agriculture.
   d. An area of the country where people mainly consume sweet treats (like cookies, ice cream, cakes, etc.) for all their meals.

4. The majority of food insecure families are located in large urban areas.
   a. True
   b. False

5. Which of the following is NOT one of the top ten sources of calories for low-income individuals?
   a. Sodas, energy drinks, sports drinks
   b. Fruits and vegetables
   c. Pizza
   d. Chicken dishes
   e. Tortillas, burritos, tacos

Part 2: Respond to the following <u>short answer questions</u>. Responses should consist of a short paragraph (about 2-3 complete sentences for each).

6. What does it mean to be food insecure?

7. Explain the correlation between food insecurity and obesity.

8. What can you interpret about hunger in the US using the "Help for the Hungry" map? (Be sure to include distribution (density, concentration and pattern).

9. Make a hypothesis. What can be done to solve this problem of food insecurity in the United States?

Appendix 2

Assessment B

Part 3: Respond to the following <u>longer response answer questions.</u> Responses should consist of a solid paragraph (about 4-6 complete sentences for each).

1. Describe the issue(s) discussed in the article.

2. Justify why hunger is a problem. Provide evidence from the article to prove why this is an important topic. (Be sure to explain how this evidence relates to the problem)

3. What is a potential solution that could be used to solve this problem?

4. What are some consequences and implications of your proposed solution and this problem as a whole?

Appendix 3

Assessment A

1. [remember]   _____
2. [understand]   _____
3. [remember]   _____
4. [understand]   _____
5. [apply]   _____

Assessment A Rubric			
	3	**2**	**1**
What does it mean to be food insecure? [remember]	-Detailed and accurate explanation of food insecurity is provided	-Brief and accurate explanation of food insecurity is provided	-Brief explanation of food insecurity is provided
Explain the connection between food insecurity and obesity [understand]	-Connection between food insecurity and obesity is stated -Solid explanation is provided regarding connection	-Connection between food insecurity and obesity is stated -Attempt is made at explaining connection	-Connection between food insecurity and obesity is stated
What can you interpret about hunger in the US from the map? [apply]	-Makes accurate interpretations from the map that reference distribution (density, concentration and pattern)	-Makes accurate interpretations from the map	-Attempts to make interpretations from the data on the map
Make a hypothesis – What can be done to solve this problem of food insecurity in the United States? [create]	-Feasible and detailed solution is proposed to solve problem of food insecurity	-Feasible solution is proposed to solve problem of food insecurity	-Potential solution is proposed to solve problem of food insecurity

Create   _____ / 1
Evaluate   _____ / 0
Analyze   _____ / 0
Apply   _____ / 2
Understand   _____ / 3
Remember   _____ / 3

Appendix 4

Assessment B Rubric				
	4	**3**	**2**	**1**
Explanation of issues [understand]	-Issue/problem is stated clearly and described comprehensively -All relevant information necessary for full understanding is included	-Issue/problem is thoroughly stated, described and clarified	-Issue/problem is stated and includes clarification and description	-Issue/problem is stated
Evidence [evaluate]	-Evidence is taken from the source, enough interpretation/ evaluation is included to develop a comprehensive analysis	-Evidence is taken from the source, interpretation/ evaluation is provided in the form of a coherent analysis	-Evidence is taken from the source & some interpretation/ evaluation is included	-Evidence is taken from the source
Solution [create]	-Specific solution is highly imaginative, taking into account the complexities of an issue.	-Specific solution is stated that takes into account the complexities of the issue.	-Specific solution is stated	-Simple or obvious solution is stated
Conclusion [evaluate]	-Conclusion is logically tied to a range of information -Consequences and implications are fully identified clearly.	-Conclusion is logically tied to information discussed. -Some related consequences and implications are clearly identified.	-Conclusion is loosely tried to some of the information discussed. -Oversimplified consequences and implications are included.	-Conclusion is attempted.

Create _____ / 1
Evaluate _____ / 2
Analyze _____ / 0
Apply _____ / 0
Understand _____ / 1
Remember _____ / 0

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