Using RubiStar to Develop Agricultural Mechanics Rubrics

Introduction

Reporting student achievement in education has been accomplished using a variety approaches or methods, from written descriptions of student progress (Guskey, 2013) to percentage and letter grading (Marzano et al., 2001; Reeves, 2011). However, traditional grading approaches are limited in their ability to accurately represent student knowledge or skill attainment (Wrinkle, 1947; Urich, 2012) and can suffer from validity and reliability issues (Allen, 2005). One of the key components of the agricultural mechanics curriculum is psychomotor skill development using project-based activities. However, using traditional grading approaches such as exams and quizzes, do not accurately articulate student achievement in this area (O'Connor, 2011). Therefore, Phipps et al. (2008) argued that scoring rubrics are a reliable tool to measure student learning.

Long hours (Froehlich, 1966) associated with large workloads (Marvel et al., 2006) are contributors to beginning teacher attrition. In an attempt to alleviate the time associated with grading and evaluating projects, teachers often employ the use of scoring rubrics (Stevens et al., 2012) Although rubrics can be used as a quick and reliable measure of student performance, the time involved in rubric development and authorship may become a deterrent from using them (Mertler, 2001). *RubiStar* is a free, online rubric development website for teachers who want to use rubrics but, do not have the time to develop them.

How it Works

To create a rubric, teachers can choose from several commonly assigned projects, including oral presentations and lab reports, and customize the rubric according to desired outcomes. After choosing a product, a new page will display tips for creating the rubric. A drop-down menu will display possible areas to evaluate. For an oral presentation rubric, for example, two possible categories are "Stays on Topic" and "Content." Choosing categories will automatically fill in specifics of the grading scale, but teachers can easily modify these by changing the text in the box.

Creating a rubric from scratch can also be accomplished by scrolling to the bottom of the Create Rubric page, with its projects for customization, and clicking the link. Basic information must be entered first, including the title and number of columns. Teachers can choose to make the rubric temporary or permanent. Since the account can store several rubrics, and there's no cost for doing so, making the rubric permanent is the best choice. The next step involves adding rows, which will be the categories being evaluated. Values, determined by the teacher, are added at the top of the rows. Next comes the most challenging, time-consuming part: creating the main content by adding descriptors. Well-written descriptors will help the teacher and the student understand what's expected and how the project will be scored. Editing and making changes can be done at any point during the process. Saving work frequently during the process is important, as a misplaced click to the previous page will lead to lost text.

Results to Date

Students enrolled in a "methods of teaching agricultural mechanics" course are required to develop a rubric for a woodworking project that the students complete in class. The students

are provided a prototype of the project from which the students must determine the bill of materials, and a procedures list, and then construct the project. Once the project is complete, the students are required to identify all measurable variables associated with the project based on the prototype provided. The students will then list all measurable components of the project including dimensions, quality of cuts, routed edges, placement of screws, buttons, sanding, finish, etc. Once all measurable components have been identified, each component is assigned a numerical score to account for a total of 100 points possible for the project. The students must then identify the acceptable tolerances (i.e. -1 per 1/16th off) for each component. The students are then introduced to the RubiStar website as a tool where the students can enter their measurable components into a rubric generator. The students have freedom to add additional variables such as work ethic, clean-up, and safety within the rubric, but are required to clearly define how those variables will be measured. Once the students have created their rubrics, they are required to share them electronically through the Blackboard course website. The students are then required to bring their rubric to class where they share a physical copy with each of their classmates. The students then use each of the rubrics provided to them to grade their project to check for validity and reliability.

Anecdotally, the students have identified RubiStar as a user friendly and time saving website that can be easily adopted for numerous projects in agricultural education. At the end of the Spring 2015 semester several student teachers had included rubrics designed on the website in their student teaching portfolios as well.

Future Plans/Recommendations to Others

The instructor of the class has considered requiring students to utilize a rubric when the students complete their peer teaching assignment in the class. Further discussion amongst the agricultural education faculty at [STATE] University should be conducted to identify student teachers should be required to develop a scoring rubric for at least one project during their student teaching experience. An inter-rater reliability analysis could be conducted to check for scoring guide reliability.

Costs/Resources Needed

The costs and resources for this activity were minimal. RubiStar is a free, online rubric development website for teachers who want to use rubrics but, do not have the time to develop them. Teachers will need internet access to run RubiStar.

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