Instructional Design Project Final Report

Team OnTheGo
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Introduction

In the United States, obesity is a growing problem, especially in the childhood and teenage years. These are the critical years when eating habits are starting to be formed. Based on the information found on web sites and from the two surveys conducted, there is definitely a need for teenagers to become more informed, healthier eaters. The goals of our instruction are for the students to gain more nutritional knowledge and be able to apply that knowledge to making informed, healthy decisions. Our specific objectives are:

- Interprets information about nutrition and is able to explain the benefits of healthy eating.
- Advises others about healthy food choices by using important parts of a food label. (calories, sugar, fat content, etc.)
- Demonstrates knowledge of nutrients in food and the food pyramid guidelines to create a healthy school lunch menu.
- Explains to the lunchroom staff the advantages of adopting their healthy food lunch menu.
- Selects and discriminates between healthy foods and unhealthy foods by participating in a scavenger hunt.

The learners of this course have varying levels of motivation. Most of the learners have a general idea of how to eat healthy and are aware that eating healthy is important. Despite this, survey results have indicated that many of the students still prefer unhealthy snacks and don't make eating healthy a priority. To make headway with these learners, it is important that the instruction be relevant and incorporate fun activities. Through motive matching and familiarity, students will understand the relevance of learning this information on nutrition. By using a variety of strategies including games and hands-on technology use, students will find the content more stimulating and relevant. Also, the instruction will be related to the learners by providing specific examples that are important to the students such as foods that they currently eat and information that they will be able to use immediately.
Development and Implementation

Instructional Approach Used

After discussion and looking at various options, the Reflective, Recursive Design and Development (R2D2) instructional model seemed to be the best fit for our instructional project. One of the principles of the R2D2 model, participatory design, refers to, "involving a design team which usually includes instructional designers, experts on the subject matter, specialists in supporting fields, and end-users." (Chen 2008). Our team worked as the instructional designers, we had the help of a subject matter expert (SME) on nutrition, and we had input from our students participating in the unit.

The R2D2 model allows the designers to get input from the students early on in the process. In our instruction the students are part of the “participatory team.” (Willis, 2000.) The designer becomes the facilitator and all decisions are made with the inclusion of the students and other team members. We included the students early on in the development of the objectives. Our original thought about instruction was to focus on teaching the students the importance of reading food labels to choose healthy foods. The results of the survey the students participated in indicated that they were already familiar with reading food labels and did not want any further instruction in it. This led us to ask what kinds of snacks they ate which indicated that even though they knew how to read the labels, they chose unhealthy foods. This gave us an idea of what kinds of things to focus on for instruction. (See Analysis and Instructional Design Documents for survey results.) We set some preliminary objectives for the instructional unit and then presented the learners with a version of the Wiki Webquest instruction. Their feedback was informative and helpful in designing the Wiki Webquest. Most wanted the instruction to be livelier with more graphics, more music, etc. They generally liked the idea of making a presentation to the lunch staff that included their menu. This helped the designers to make more decisions about instruction. “The fuzzy objectives you begin with will influence your design and development, but conversely, design and development will also influence the objectives.” (Wills, 2000.)

"With R2D2, the ID team is expected to actively reflect on and analyze work to date and regularly revise and rework both the material being developed and the models that underlie its development." (Chen 2008) The figure below shows the idea that this model of instruction is recursive and reflective while flowing in a non-linear way. Once the team received the students’ feedback, we reflected on them and will use their suggestions to improve the instructional unit. We also presented the final Wiki Webquest to our SME to get her ideas about the validity of instruction. “R2D2 views design work as a richly interactive process, in which solutions emerge across a process....” (Willis, 2000.) Our team feels that we are continuing to develop the unit and it is most assuredly a process: a process that includes the students in the continual development of the instructional unit.
Key Development Decisions and Justification

The development of instruction began with the first major decision of identifying the focus or goal of instruction. This was determined by a survey we conducted with Sheila’s students. Our first thought was to instruct students in healthy living, but we narrowed it down to providing nutritional information that would allow students to make informed healthy food choices. The topic of healthy living was too broad and from the two initial surveys we concluded that our target audience, 12-14 year olds, would benefit from having access to nutritional guidelines.

Another decision made early on was the instructional design model to be used. The team wanted to include the students as part of the design team and we also had access to a nutritionist as a subject matter expert (SME). The R2D2 constructivist design model allowed for us to include all of those people as part of the design team. The students were adolescents and in order to make the learning relevant it was important to include them in the lesson design. This design model allowed the lesson design to be reflective of the needs and perspectives of the students and our SME. The instructional wiki webquest was adjusted as the designers received input from all members.

The next decision our team discussed was how to grab the student’s attention and we decided on a scavenger hunt. The scavenger hunt was designed for the students to make decisions between healthy and unhealthy food choices. We felt this activity would fall under the attention category of the ARCS model, "capturing the interest of learners; stimulating the curiosity to learn." (Keller, 1987).

The final decision we made was what form the instructional materials would be. As a team we decided that it should be something they could use to gather their information and use that information to develop their projects. We decided that a webquest would be a good format. A Webquest is an online activity that is developed for the purposes of providing web based resources students can use to gather information. (http://webquest.sdsu.edu/about_webquests.html) We modified this webquest using a wiki platform, so the students could be more involved in designing the instruction. A wiki allows the students to edit the information on the site. We termed this activity a Wiki Webquest. This decision allowed the students to be involved as much in the design of the unit as possible. We wanted it to be engaging as well as informative. Any
further instruction of this lesson could accommodate the learners by allowing them to add information to this format.

Methods Used to Evaluate the Instruction

Evaluation for this instructional unit was comprised of several different parts. The student work was evaluated based on survey results, student participation, and the quality of the final lunch menu proposals. Appendix A includes some sample student work and the evaluation forms filled out by the SME and lunch room staff member. The instructional unit was evaluated based on observations of students, SME/Expert feedback, student feedback, and an overall rubric evaluation done by the instructor. More detailed information on the evaluation and findings are described in the sections below.

Content Accuracy

The content accuracy of the instruction was primarily verified by our SME (Cathy Drost) during her reviews of the scavenger hunt, wiki, and lunch menu proposals. The lunch room staff member that viewed the student presentations also helped in verifying the accuracy of the student's information. Information included on the instructional materials was taken from reputable sources.

Appropriateness of Objectives

Objectives are written to focus the instruction, to provide a framework for instruction, and also guide the learner to identify the content he/she must master. (Morrison, G., Ross, S. & Kemp, J. 2004). Our instruction dealt with the affective domain, so our objectives were written with that in mind. We used Krathwohl’s Learning Taxonomy to write our objectives. We wanted our instruction to change the eating habits of our target audience. The objectives revolved around this value change we wanted.

Instructional Quality

The instructional quality was evaluated by our SME (Cathy Drost) and by the members of the design team. Three of the four members of our team are educators and work in classrooms developing quality instruction. This expertise was used in developing the instruction of this lesson. There were also suggestions provided by the health teacher.

Visual Design, Production Quality, and Usability

The visual design, production quality, and usability of this instructional unit was evaluated throughout instruction by the students, SME, and our design team. Student feedback was primarily gathered through survey results and discussions with them. During instruction, some of the instructional materials were shared with other teachers at Waukee schools who shared their thoughts on the materials. Post-instruction, some feedback was also received from Mike Sullivan, a user design expert at IBM. Multiple revisions were made to the instructional materials to ensure these comments were addressed. Students also had the option to edit the wiki, but none of them chose to do so. Observations by the instructor
were also used in detecting some usability problems with the different activities.

Findings from Evaluation

**Evaluation of Student Work**

Prior to instruction, students completed two surveys that were used to get some preliminary information on student attitudes. The survey feedback indicated that students generally preferred unhealthy foods and weren't concerned with nutrition. Observation and discussion with students also indicated a general negative attitude towards eating healthy. Throughout the instruction, instructor Sheila Allen monitored the students. She reported that some students were clearly more interested in this activity than others. To improve overall participation, some external motivators (praise from instructor, feedback on discussion boards, and a healthy lunch celebration at the end, etc) were provided that seemed to help. The attitudes of students were also shown through their effort in creating the lunch menus. The more quality lunch menu proposals were created by the students that seemed more motivated to eat healthy.

The student lunch menu proposals were evaluated first by the SME. Unfortunately, due to time considerations, the students did not have an opportunity to revise their lunch menu proposals based off the SME feedback. After the presentation of their lunch menu proposals to the lunch room staff, the lunch room staff completed a form that evaluated the student work. The students reviewed all of these comments which gave them some indication of how good their proposals were.

**Evaluation of Instructional Unit**

*Scavenger Hunt*

The scavenger hunt's purpose was primarily as an ice-breaker and as a way to introduce the topic of nutrition to them by identifying healthy or unhealthy foods. The evaluation of the scavenger hunt was based off SME feedback and observations of the students. The SME evaluated the scavenger hunt materials after the scavenger hunt was complete and made some suggestions for improvement. As the students completed the scavenger hunt, several issues came up that would also need to be taken into consideration in future iterations of this instructional unit.

*Wiki Webquest*

The Wiki Webquest was a more involved activity and evaluation was done throughout the instructional design process. The students, SME, and CI503 instructor provided feedback during the design of the wiki which resulted in changes to the content and look-and-feel of the wiki including improving the graphics and navigation. The SME also reviewed the wiki for technical accuracy. The effectiveness of the wiki was based in a large part on the quality of the student lunch menu proposals. The feedback
from the SME and lunch room staff helped in this determination. The lunch menu proposals were generally okay, but due to time considerations were not of as high of quality as we'd have hoped.

Upon completion of the instructional unit, the students were asked to complete a survey. These survey results are listed in Appendix B. The survey was used to gather additional feedback about the effectiveness of the wiki, the usability, and the visual design. Almost half of the students requested the use of more color and graphics. Post-instruction, we also got some feedback from Mike Sullivan, a user-design expert at IBM. Mike liked the overall look of the wiki, the font choice, balance of text and images on the pages, and the inclusion of YouTube videos. He suggested moving the 'Navigation' section above the 'Actions' section and specifically mention to use the 'Navigation' section on the home page.

Overall

The instructional unit itself was evaluated in several ways. Surveys were conducted prior to instruction as well as post instruction. The earlier survey results can be found in the analysis and instructional design documents. The response from question three provided some evidence that the students learned some facts about nutrition during the instruction. The responses from questions four and five indicated that the instruction did improve attitudes somewhat.

The survey results were reviewed by the instructor and used in completing a rubric measuring the overall effectiveness of instruction. This rubric is included in Appendix C. This same rubric was also completed prior to instruction. The intent of the rubric was to quantify the improvement in student attitudes. When the rubric was completed prior to instruction, the instructor evaluated how well she thought the students could complete the prescribed activities. When completing the rubric post-instruction, the instructor also took into consideration the evaluation results from the Wiki Webquest while completing her rubric scoring. Below are the results from the rubric scoring. The target goal level was set at reaching about 75% proficiency. Based off these findings, the instruction was deemed a success.

Scoring Prior to Instruction:
- Knowledge/Accuracy = 2 (Lacks Nutrients)
- Justification of Choices = 2 (Lacks Nutrients)
- Group Activity = 1 (Malnourished)
- Presentation/Project = 2 (Lacks Nutrients)
- TOTAL = 7 / 16

Scoring Post Instruction:
- Knowledge/Accuracy = 3 (Healthy)
- Justification of Choices = 3 (Healthy)
- Group Activity = 3 (Healthy)
- Presentation/Project = 3 (Healthy)
- TOTAL = 12 / 16
Another form of evaluation that our group did not have a chance to complete were some final observations of the students. Some observations had been done prior to instruction to see what foods students were choosing at lunch. Observations were planned a few weeks after instruction to see if students were generally choosing better food or not.

Revisions to be made to the Instruction

Recommended Revisions

Below are some recommended revisions that are based off of input received during instruction and analysis done post-instruction.

Scavenger Hunt

- The instructor noted that the order of the clues in the scavenger hunt should be adjusted so that students don't have to run around so much. The computer lab clue should have been earlier on in the sequence to avoid a long run from the band room to the computer lab.
- The SME noted that the scavenger hunt clue cards were created using the old food pyramid picture. The new picture should be added.
- The scavenger hunt food pyramid information should be incorporated more into the activity. Perhaps the students should have been asked to complete a worksheet when they returned to the classroom, or something along those lines.
- Students participating in the scavenger hunt were recorded on video. The video showed that it was too easy for students to discern the healthy pictures from the unhealthy ones. It would help to add additional unhealthy food pictures at each location. Additionally, the instructor notes should include a mention to not put the pictures in the same layout on the walls. One of the students picked up on a pattern in that all the healthy pictures were to the left of the unhealthy ones.

Wiki Webquest

- The instruction should begin immediately following the scavenger hunt. There should not be more than a day break between the completion of the scavenger hunt and the start of the wiki webquest activity. The instructor noted that this break in instruction made it more difficult for students to be focused when starting the wiki webquest activity.
- The evaluation form that the SME and lunchroom staff filled out needs to be more granular. A scale like 1 (low) to 10 (high) would have helped better distinguish the quality of student lunch menu proposals.
- Students noted that the wiki was still not colorful enough and did not contain enough graphics/animation. Students didn't seem to have difficulties in navigating the wiki, though.
- The students seemed to get the most benefit out of the links to the calorie information on the wiki. Consider making this page more prominent in the future and paring back some of the other content.
- User design expert Mike Sullivan recommended the 'Navigation' section be moved to upper-left corner of Wiki. He also recommended the home
page wording be changed to say, "Choose links on the left-hand side (in Navigation) to gather your information."

**Overall**

- The instruction timeline called for two weeks of instruction. The instruction did not specify how much time to allocate each day, though. A regular 45 minute class period would have been more appropriate.
- Students generally were not motivated to put together a quality lunch menu proposal. Alternative ways to get students motivated are needed. Some ideas might be to do the unit for a grade, incorporate this instructional unit into the curriculum of a Health class, or have the lunchroom staff commit to making a meal from the best lunch menu proposal.

### Authorship of the Project

<table>
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<th>PRIMARY AUTHOR</th>
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<td><strong>Analysis</strong></td>
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<td>Objectives</td>
<td>Marian</td>
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<td>Process used for analysis</td>
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<td>Needs Analysis</td>
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<td>Content Analysis</td>
<td>Marian</td>
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<td>Learner Analysis</td>
<td>Sheila</td>
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<td>Context Analysis</td>
<td>Brent</td>
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<td>Appendices</td>
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| **Instructional Design Document** |                |
| (Overall – All)                  |                |
| Objectives                       | Marian         |
| Instructional Design Model       | Kristin        |
| Components of Instruction        | Marian         |
| Activities and Sequence of Instruction | Brent |
### Motivational Strategies
- Kristin

### Evaluation Plan
- Brent

### Surveys and Results
- Marian

## Instructional Materials
(Overall – All)

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<thead>
<tr>
<th>Method Used</th>
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<td>Evaluation</td>
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<td>Gathering Feedback From Students/Staff</td>
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## Final Report
(Overall – All)

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<th>Kristin/Marian</th>
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<tr>
<td>Introduction</td>
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<td>Development and Instruction</td>
<td>Kristin/Marian</td>
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<tr>
<td>Findings from Evaluation</td>
<td>Brent/Sheila</td>
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<td>Major Writing and Editing</td>
<td>Kristin</td>
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<td>Appendices</td>
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## References


Appendix A
Evaluation of Student Work for Lunch Menu Proposal

Student Work

Healthy Lunch
By: Donovan Austin Henry Brennan

Main Lunch Monday
- Noodles
- Cheese
- Apple
- grapes

Tuesday Main Lunch
- Wheat Waffles
- Turkey Bacon
- Tea
- Banana

Wednesday Main Lunch
- Sub sandwich
- Tomatoe
- Lettuce
- Turkey
- Snacks

Thursday Main Lunch
- Homemade Tomato soup
- Belliee Cracker
- Salted Brocolli cheese
- Oranges
- Baby Carrots

Friday Main Lunch
- Wheat Spaghetti
- Turkey sauce
- Garlic bread
- Pears
- Sliced tomatoes

SME Feedback
School Lunch Menu Proposal Form

1. Rate the nutritional value of the food menu: Excellent Good Fair Poor
   
2. Which menu choices did you like? Why?
   
   Overall a good variety of menu options. Turkey, beans, and ground turkey in spaghetti sauce were smart choices and easy to substitute.

3. Were there any food choices that were listed that would not be considered healthy? Please specify these foods.
   
   Nacho chips and cheese provide a lot of calories, sodium, and fat.
   Tater tots are usually high in fat and calories.

4. Is this menu something that would be possible to incorporate? Yes

5. Any other comments?

   Mashed - Needs good base for meal protein. Grilled a vegetable in place of one fruit.
   
   Pasta - Whole wheat pasta would provide more nutritional value than only wheat. Turkey bolognese option for lower fat. Tater tots are still high in fat.
   
   Soup - Nutrition content would be improved with a fruit salad.

   Kids - Whole wheat spaghetti would be a good choice. Spaghetti sauce with ground turkey would be a lower fat choice.

Lunch Room Staff Feedback
Appendix B

Student Survey Results

1. What parts of the Healthy Responses Webquest were most helpful in putting together the school lunch menu proposal?
   - The contents of food
   - The page that showed the calories helped us and showed us what kinds of food have a lot of calories
   - Maybe a page where you can compare our lunch to something healthier
   - Were (sic) they told calories
   - The website that showed us how many calories where (sic) in the food
   - The part that told the calories
   - The contents because you could tell if you were getting good or bad fat content and fiber stuff
   - Told you all the calories
   - When you got to the food it made it easy
   - Calorie guide

2. What parts of the Healthy Response Webquest were least helpful in putting together the school lunch proposal?
   - The food was bad and was hard to make healthy
   - The other pages that we didn’t need to use
   - The way they wanted us to do the menu
   - The wiki page
   - The food pyramid because there was already one on the calorie website
3. List three things that you learned about nutrition from completing this project.
   - Wheat is good for you, veggies are good, and you need protein
   - You should know how many calories you eat, know what foods have a lot of calories, make sure you get the right portions of fruits and vegetables
   - Calories, eat fruits with every meal, protein
   - It's not easy coming up with a lunch menu, how many calories that were in an apple, how many calories the lunch menu had to have
   - Whole wheat is better than white bread, turkey and chicken are better for you than red meat, some things might seem healthy but they can have a lot of sodium and other bad things in them
   - Turkey is healthier for meat (sic), and things baked are healthier
   - Grilled chicken is better, whole wheat bread is better; it's harder than it looks to come up with something healthy
   - What is healthy, lunch can sometimes not be healthy, how to do a project about food
   - That variety is always good, it's good to eat white meats, baked things are better than fried
   - Whole wheat is healthy, pizza have a lot of calories
   - For grain products always eat whole weat (sic)

4. Did this unit on nutrition help motivate you to eat healthier?
   Yes 58.3%  No 41.7%

5. Explain your answer to question 4.
   - I ate healthy already
   - I ate healthy already
   - It showed that some of the food I eat have a lot of calories
   - Because it is gross what we sometimes eat at school lunch
   - I eat pretty well so ya......
   - I will try an eat more whole wheat instead of white and eat more chicken and turkey
   - It didn’t really make a difference, and I already lyk(sic) things baked more that I do fried.
   - It helped me realize what is actually in the food at school we eat
   - I want to eat healthy
   - I eat healthy now so this helps me to continue
- It explained to me some of the healthier things I can eat at lunch
- Didn’t have enough time for the power point

6. What changes would you make to the design of the Wiki Webquest to make it more appealing for kids your age?
   - Have bad food on it with calories
   - Give a complied list of food choices for the student to put in the right place
   - More colorful
   - More colors, fun pictures, better questions
   - Add pretty color and games
   - More colorful more pictures more animations
   - Put fruits we know of and eat and make the webpage look cooler
   - Make it more fun
   - Nothingggggg? (sic)
   - None
   - More pictures and videos

7. What did you like about the Wiki Webquest?
   - I liked what it said about food
   - How you can talk to other people and tell them what you did
   - The links to the calories comparison page
   - I can take(sic) to people
   - It had links to useful websites and it had a lot of good information
   - That you can write the discussion thing about what you did
   - It was easy to navigate thru
   - Easy
   - It gave us feedback
   - How it explained things in an easy to understand way

8. What did you like about the project?
   - I liked to see the healthy food
   - We could design it the way we wanted to
   - Making the poster and figuring out the calories
   - That we could work in groups
   - I got to take(sic) with friends
   - It helped me learn more about nutrition and that our school’s meals aren’t very nutritious
   - That we could come up with our own ideas but make them healthier
   - We got to come up with our own menu
   - Easy
   - The way we could design it
   - That we could make a difference in the way we eat at lunch and that we can all be much healthier
   - The power points are fun to make
## Appendix C
### Overall Rubric

<table>
<thead>
<tr>
<th></th>
<th>Well Balanced Diet (4)</th>
<th>Healthy (3)</th>
<th>Lacks Nutrients (2)</th>
<th>Malnourished (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge/Accuracy</strong></td>
<td>Students demonstrate a thorough understanding of healthy food choices. *Student is able to accurately evaluate a meal and determine whether it is nutritious.</td>
<td>*Students demonstrate a clear understanding of healthy food choices. *Student is able to evaluate a meal and determine whether it is nutritious or not.</td>
<td>*Student demonstrates some understanding of healthy food choices, but has some difficulty evaluating a meal and determining whether it is nutritious.</td>
<td>* Students demonstrate little understanding of healthy eating practices. * Students unable to evaluate a meal accurately.</td>
</tr>
<tr>
<td><strong>Justification of Choices</strong></td>
<td>*Students provide several specific relevant facts with clear explanations. *The students make a strong convincing argument. *Students are able to justify their meal plan decision or advice with clear and specific explanations.</td>
<td>*Student provides several facts to support his/her viewpoint and convince the audience. *Students are able to justify their meal plan decision or advice.</td>
<td>*Lack of sufficient facts to support his/her viewpoint, the student does not convince the audience. * Students are vague on the explanation of their meal plan decision or advice.</td>
<td>* Little if any facts to support their viewpoint are present. * Students are unable to justify their meal plan decision or advice.</td>
</tr>
<tr>
<td><strong>Group Activity</strong></td>
<td>*Students are able to create a well-balanced and nutritious meal plan that includes a wide variety of foods for the school cafeteria.</td>
<td>*Students are able to create a well-balanced and nutritious meal plan for the school cafeteria.</td>
<td>* Students are able to create a meal plan, but some choices may or may not be nutritious.</td>
<td>* Students create a meal plan that lacks knowledge of a well-balanced meal</td>
</tr>
<tr>
<td><strong>Presentation/Project</strong></td>
<td>* Student is able to express his/her opinion about healthy eating and influence others in a persuasive manner through the chosen medium.</td>
<td>* Student is able to express his/her opinion about healthy eating and influence others in a persuasive manner through the chosen medium.</td>
<td>*Student is able to give his/her opinion about healthy eating but may or may not be able to influence or persuade others.</td>
<td>* Student’s opinion about healthy eating is not clear and persuasive.</td>
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