

DEVELOPING NUTRI- SCIECARD GAME IN SCIENCE III

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Abstract: Filipino children are threatened with the increasing intake of junk foods which often resulted to health problems such as obesity, malnutrition, gastro-intestinal and urinary related illnesses. This Study was conducted to develop and validate a nutri- scie card game intended to foster awareness on safe foods among school children. The researcher made use of the Research and Development model by Borg and Gall with the following phases: identification of learning competencies; development of nutri scie card game; and validation of the nutri- scie card game by subject experts and experts in instructional materials development. Result of the validation revealed that Nutri -Scie Card game is highly valid.

Keywords: Nutri-Scie Card Game, Instructional Material, Filipino School Children, Malnutrition.

1. INTRODUCTION

Research results revealed that dietary intakes of school going population are not consistent with national recommendation [1,2]. School children and adolescents usually consume food with high saturated fats, total fats, sodium, and soft drinks. They have low intake to healthy foods such as high in fiber to include fruits and vegetables, whole grains, and calcium-rich foods. The high intake of saturated fats often may result to increase the risk of heart disease and stroke because they raise the “bad” LDL cholesterol in the blood. Sources of saturated fats include coconut oil, cheese, fatty cuts of meat, hard hydrogenated margarine, and butter. [3].

Eating patterns of children and adolescent is influenced factors such as media [4], individual food preferences, family meal patterns, and parental role modeling. Harris, Bargh and Brownell [5] found out that Children consumed 45% more when exposed to food advertising. Adults consumed more of both healthy and unhealthy snack foods following exposure to snack food advertising compared to the other conditions. In both experiments, food advertising increased consumption of products not in the presented advertisements, and these effects were not related to reported hunger or other conscious influences. The larger time spent by children and adolescent in school also influences their eating and food preferences [6].

In the Philippines, malnutrition remains a serious problem especially among children. An estimated 3 million children in the Philippines are undernourished. According to the latest study by the country's Food and Nutrition Research Institute (FNRI), three in every 10 Filipino children aged five and younger are too short for their age, while two in every 10 are underweight[7] Also, FNRI reported in the 7th National Nutritional Survey conducted in 2008 that for every 100 adolescents aged 11-19 years, 17 were underweight and 5 were overweight. This could mean that 22 % of adolescents were unhealthy.

Providing food safety to Philippine schools the Department of Education issued Department Order number 52, s. 2008 that sets regulations to Philippine elementary and secondary schools on the quality of food served in school canteens. That food served in school canteen should be safe, nutritious and affordable [8] . School children and adolescents do not end up eating inside school premises. Processed foods in groceries, sari sari stores are mostly patronized by consumers. Fostering awareness on healthy, nutritious and affordable foods, this nutria-Scie card game has been conceptualized.

Research Objective:

1. Develop science card games selected topics in Elementary science which can be used as instructional materials.
2. Validate this game among elementary pupils in Elementary school.

2. THEORETICAL/ CONCEPTUAL FRAMEWORK

With bases well established in the constructivism of Vygotsky, Piaget and Dewey, Contextual Teaching and Learning is about to help students not only to memorize contents but also to construct the relation between subjects in order to define their meaning. Contextual Teaching and Learning represents an important field of study and analysis that can be widely research, especially in Video Games and virtual technologies. This paper proposes a Card Game based User Interface that reduces the player's learning curve of the gameplay and help the game content to be assimilated during the player's progress. Such interface can be applied to educational and non-educational Video Games always providing context, i.e. meaningful content, trough text card's design.

The development of the games for the selected science topics is the basis of the conceptual paradigm of the study.

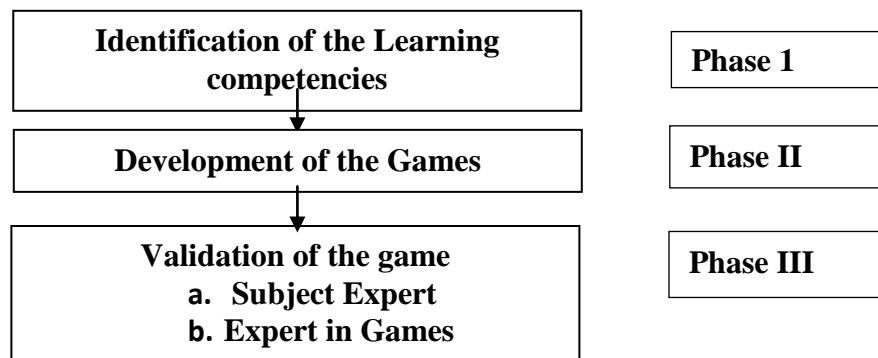
Conceptual Paradigm

Figure1.The research paradigm shows the different phases in the preparation and validation of the games.

The research paradigm shows the different phases in the preparation and development of the games.

The paradigm of the research consists of four phases. Phase I of this study is the identification of learning competencies followed by phase II which is the development of the game, and phase III is the validation of the game.

3. METHODOLOGY

Research Design:

The study made use of R and D method for the development of instructional materials in Elementary Science. The research paradigm showing the different phases in the preparation and development of the games.

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Locale of the Study:

The study was conducted at Sta. Lina Elementary School, San. Francisco Elementary School, Tumog Elementary School and , Bacsay Elementary School. All these schools are located at Luna, Apayao, Philippines.

Respondents of the Study:

The respondents of the study were the 10 elementary teachers from Luna District , 5 instructional materials experts from the Apayao State College and 30 elementary pupils from Tumog Elementary School for the initial try out of the materials.

Research Instrument:

The research used the developed Science card game. Face validation tool was designed where in questionnaire was used to evaluate the game. In this, the following scale was used: 5 – highly valid; 4 – valid; 3 – undecided; 2- not valid; 1- strongly not valid. The questionnaire was used to determine the validity. It consisted of 4 subs – criterion as follows: the material used rules, questions, and the card game itself. Space for comments and suggestions was also included below the questionnaire.

Research Procedure:

Initially, the researchers forwarded a letter of approval to concerned offices for the conduct of the study. First to the president of Apayao State College, then to the schools division superintendent of Apayao Division and the school heads where validation and try outs was conducted.

After approval has been made, learning competencies were reviewed and identified as basis for the development of the game. After which nutri-scie card games were developed. The materials were validated by subject experts and instructional materials development experts.

The face validation tool was then administered for the purpose of the games' validity. After which, the answered questionnaires were collected then tabulated, analyzed and interpreted.

Statistical Treatment of Data

Mean was used to describe respondents' response to each statement on the face validation tool

Table 1:Limits and verbal description from the scale used in the study.

| Scale | Limits of description | Verbal description |
|-------|-----------------------|--------------------|
| 5 | 4.20 – 5.00 | Highly Valid |
| 4 | 3.40 – 4.19 | Valid |
| 3 | 2.60 – 3.39 | Undecided |
| 2 | 1.80 – 2.59 | Not Valid |
| 1 | 1.00 – 1.79 | Strongly Not Valid |

4. RESULTS

The Game and its Rule

Number of Player

The game consists of two player. The first player to set nutri category will be determined through tossing of coin or rolling a die. The player who has the greater number of head appearing in a toss will be the first one to set the nutria category. The nutria category are nutritional content of the food in the card each player is holding.

The goal of the game

- The aim of the game is to get all the cards from the opponent player.

How to start the game

- The game will start by means of tossing a coin. The winner of the tossing of the coin will be the first one to set the nutri category.

Choosing a Category

- The first to draw the game will choose a category. Categories are nutrient component found in foods as iron, calcium, potassium, vitamins, sodium or cholesterol fat.

Commence Playing


- The one who won the tossed coin will be the first one to choose and pick his/her card. After choosing and picking his/her card, the player will look the content for the opponent player to beat according to the content of the set nutri category. For nutritious food (natural/ no preservatives) Player with the higher nutri category will get the card of the opponent player. In the case of food additives (usually found in junk foods and preserves) food additives such as sodium, carbonates and others, winner of the nutri category will be the lesser one.

Continue playing


- In matching the card; if the content is substantial it should be higher in content like iron, calcium, potassium and vitamins. If the content is additives, it should be lower in content like sodium and cholesterol and fat. If the card of the first player contains higher iron, calcium, potassium and vitamins then he/she will get the opponents card until nothing will left from them. The player with greatest number card left will be declared winner.

The Game


The sample card game.



| Avocado | | | |
|---------------------|-------|-----------|-------------|
| Nutrition Facts | | | |
| Calories 160 | | | |
| % Daily Value* | | | |
| Total fat | 15g | | 23% |
| Saturated fat | 2.1g | | 10% |
| Polyunsaturated fat | 1.8g | | |
| Monounsaturated fat | 10g | | |
| Cholesterol | 0mg | | 0% |
| Sodium | 7mg | | 0% |
| Potassium | 485mg | | 13% |
| Total Carbohydrate | 9g | | 3% |
| Dietary fiber | 7g | | 28% |
| Sugar | 0.7g | | |
| Protein | 2g | | |
| Vitamin A | | 4% | |
| | | 2% | Vitamin C |
| | | 16% | |
| Calcium | 1% | Iron | 3% |
| Vitamin D | | 0% | Vitamin B-6 |
| | | 15% | |
| Vitamin B-12 | 0% | Magnesium | 7% |




| Papaya | | | |
|---------------------|-------|-----------|-------------|
| Nutrition Facts | | | |
| Calories 43 | | | |
| % Daily Value* | | | |
| Total fat | 0.3g | | 0% |
| Saturated fat | 0.1g | | 0% |
| Polyunsaturated fat | 0.1g | | |
| Monounsaturated fat | 0.1g | | |
| Cholesterol | 0mg | | 0% |
| Sodium | 8mg | | 0% |
| Potassium | 182mg | | 5% |
| Total Carbohydrate | 11g | | 3% |
| Dietary fiber | 1.7g | | 6% |
| Sugar | 8g | | |
| Protein | 0.5g | | 1% |
| Vitamin A | | 19% | Vitamin C |
| | | 101% | |
| Calcium | 2% | Iron | 1% |
| Vitamin D | | 0% | Vitamin B-6 |
| | | 0% | |
| Vitamin B-12 | 0% | Magnesium | 5% |




Banana
Nutrition facts
Calories 89

| | % Daily Value* | |
|--------------------------|----------------|-----|
| Total fat 0.3g | 0% | |
| Saturated fat 0.1g | 0% | |
| Polyunsaturated fat 0.1g | | |
| Monounsaturated fat 0g | | |
| Cholesterol 0mg | 0% | |
| Sodium 1mg | 0% | |
| Potassium 358mg | 10% | |
| Total Carbohydrate 23g | 7% | |
| Dietary fiber 2.6g | 10% | |
| Sugar 12g | | |
| Protein 1.1g | 2% | |
| Vitamin A 1% | Vitamin C | 14% |
| Calcium 0% | Iron | 1% |
| Vitamin D 0% | Vitamin B | 6% |




Cheez-It
Nutrition Facts
Serving Size 30g
Servings Per Container about 5/6
Amount Per Serving
Calories 137 Calories from Fat 45

| | %RENI* | |
|-------------------------|-----------|----|
| Total fat 5g | 8% | |
| Saturated Fat 3g | 15% | |
| Trans Fat 0g | | |
| Cholesterol 7mg | 2% | |
| Sodium 264mg | 10% | |
| Total Carbohydrates 21g | 8% | |
| Dietary Fiber 0g | 0% | |
| Sugars 2g | | |
| Protein 2g | 4% | |
| Vitamin A 33% | Vitamin C | 0% |
| Calcium 0% | Iron | 0% |



Muncher
Nutrition Facts
Packing Size 10g
Serving Size 25g
Serving Per Container about ½

| | Calories From Fat 40 | |
|------------------------|----------------------|----|
| | % Daily Value * | |
| Total Fat 5g | 7% | |
| Saturated Fat 4g | 21% | |
| Trans Fat 0g | | |
| Cholesterol 0mg | 0% | |
| Sodium 120mg | 5% | |
| Total Carbohydrate 14g | 5% | |
| Dietary Fiber 4g | 18% | |
| Sugars 2g | | |
| Protein 5g | | |
| Vitamin A 0% | Vitamin C | 8% |
| Calcium 0% | Iron | 6% |



Prawn Crackers
Nutrition Facts
Serving Size 1.06 oz. (30g)
Serving Per Container about 1
Amount Per Serving

| | % RDA | |
|------------------------|-----------|----|
| Energy 130kcal | 5% | |
| Calories from Fat 30 | | |
| Total Fat 4g | 6% | |
| Saturated Fat 3g | 15% | |
| Trans Fat 0g | | |
| Cholesterol 0m | 0% | |
| Sodium 220mg | 9% | |
| Total Carbohydrate 24g | 8% | |
| Dietary Fiber 0g | 0% | |
| Sugars 1g | | |
| Protein 2g | 3% | |
| Vitamin A 35% | Vitamin C | 0% |
| Calcium 0% | Iron | 0% |

Validation

Degree of agreement of the teacher and students on the developed card game in some specific criteria:

| Criterion | Computed Mean | Descriptive Value |
|-------------------------------|---------------|---------------------|
| A. Materials used are: | | |
| • suited to the activity | 4.73 | Highly valid |
| • easy to the activity | 4.07 | Valid |
| • easy to use | 4.33 | Highly valid |
| • appropriate to the game | 4.6 | Valid |
| • user – friendly | 4.4 | Valid |
| Mean | 4.43 | Highly valid |
| B. The rules are: | | |
| • easy to follow | 4.33 | Highly valid |
| • strongly implemented | 4.13 | Valid |
| • concise and clear | 4.47 | Highly valid |

| | | |
|--|-------------|---------------------|
| Mean | 4.31 | Highly valid |
| C. The questions are: | | |
| • based from science topics | 4.6 | Valid |
| • clear and easy to understand | 4.27 | Highly valid |
| • challenging | 4.27 | Highly valid |
| • categorize into easy, average, difficult | 4.13 | Valid |
| Mean | 4.32 | Highly valid |
| D. The Science Card game is: | | |
| • Captivating | 4.07 | Valid |
| • an aid to enhance the student learning ability | 4.4 | Valid |
| Mean | 4.24 | Highly valid |
| Grand Mean | 4.33 | Highly valid |

Highly valid results were obtained in all the criteria set for evaluation. On materials used a mean rating of 4.43 Which is highly valid, 4.31 on rules which is also highly valid, 4.32 on questions which is also highly valid, 4.32 on the scie-card describe as highly valid and an overall mean of 4.33 describe as highly valid.

5. CONCLUSION

In the light of the findings, it can be concluded that the developed nutri-scie card game is highly valid as a result of the validation.

6. RECOMMENDATION

The following are forwarded as recommendations:

1. Test the effectiveness of Nutri-card games to other group of students.
2. Encourage Science teachers to use the developed Nutri-card games for classroom instruction.
3. Develop other instructional games for specific topics in Science .
4. Evaluate nutri- scie card game in experimental design.

REFERENCES

- [1] Gidding, S. et. al. AHA Scientific Statement. Dietary Recommendations for Children and Adolescents 2005. Retrieved from <http://circ.ahajournals.org/content/112/13/2061.full>. On June 26, 2016
- [2] Nutrition –Related Health Concerns, Dietary Intakes, and Eating Behaviors of Children and Adolescents. Retrieved from <http://www.nap.edu/read/11899/chapter/4>
- [3] Murphy, A. and Buccino, J. 2011. Fats in Children’s food: What you need to know. Retrieved from <http://www.aboutkidshealth.ca/EN/HEALTHAZ/HEALTHANDWELLNESS/NUTRITION/Pages/fat-food-child-nutrition.aspx> on June 26, 2016
- [4] Arcan, C., Bruening, M., Story, M. 2013. Television (TV) and TV Advertisement Influences on Children’s Eating Behaviour. Retrieved from <http://www.child-encyclopedia.com/child-nutrition/according-experts/television-tv-and-tv-advertisement-influences-childrens-eating> on June 28, 2016
- [5] Harris, J. Bargh J. and Brownell, K.(2009). Priming Effects of Television Food Advertising on Eating behaviour. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/19594263> o June 26, 2016
- [6] Wechsler H, Devereaux RS, Davis M, Collins J. Using the school environment to promote physical activity and healthy eating. Preventive Medicine. 2000;31:S121–S137. doi: 10.1006/pmed.2000.0649 on June 26, 2016
- [7] Integrated Approach to Address Food and Nutrition Security in the Philippines Retrieved from Retrieved from <https://www.idrc.ca/en/project/integrated-approach-address-food-and-nutrition-security-philippines> on June 27, 2016
- [8] DO 52, s. 2008 - Compliance With DepED Policies on Food Safety in Schools. Retrieved from <http://www.deped.gov.ph/orders/do-52-s-2008> on June 27, 2016