

**NATIONAL CAPITAL REGION**

**Policy, Planning and Research Division**

**BERF-COMPLIANT ACTION RESEARCH PROPOSAL TEMPLATE**

**TITLE: Simulation of Color-Coded Circles in Solving Composite Functions**

**“I am with You, you’re with me” an Intervention Material on Solving Composite Functions**

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Schools Division Office of Valenzuela

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| RATIONALE OF THE ACTION RESEARCH | CONTEXT | One of the competencies under the General Mathematics subject is solving composite functions. This functions can be described as a series of “picking up” and “dropping off”. This means that one function can be substituted to another function and does something to it. This pattern can or may continue over several functions. This refers to the combining of two or more functions in the manner where the result from the first function can be the input of the second function. (Donna Roberts, 2012).  For the past three years, solving composite functions is the one the least mastered skill of grade eleven students under the HUMMS, GAS and TECH-VOC strand. The mastery level from 2017 – 2019 are 45.63, 40. 69 and 35.48 respectively. Based on the data presented we can see that the mastery level of the students are falling under this competency. This results provides proof that students find difficulty unraveling composite functions.  Other teachers teaching general mathematics subject also revealed that the performance of grade eleven students in solving composition of functions is way below the needed mastery. It is for these reasons the researcher is eager to find a method that would lessen the difficulty of the students in solving composite functions.  The study focusing on the development of the simulation of color coded circles in solving composite function as a strategy to help grade eleven students increase their mastery on the said competency. |
| PROPOSED INTERVENTION,  INNOVATION,  STRATEGY | From the article math betterexplained.com, colorizing math equations can actually help learning a concept and do more of it. There are few reasons why colorized equations are more fun. First, is that it forces an analogy for the equation. Colors can help distinguished thing that are not stated in the equations. Second, the colors serves as a diagram in the given problem. Lastly, colors is a technical description of math equations.  In Addition, the four color theorem states that no more than four colors are required to represent any mathematical equations so that even the elementary level student can grasp the idea. (Jesus Najera, 2019). This means that color is the most practical way to simulate mathematical equations and confidently graspable at an undergraduate level.  The student will use the color coded circle to recreate or simulate the functions given. There are two types of color coded circle, the functions and the variable of the function. The bigger circle represents the variable of the function, and the smaller circle is the function itself. The students can choose whatever color he/she wish to simulate in the circle as long as the color of the bigger and smaller circle is the same that corresponds the function. This intervention strategy will help the students easily understand the concept of solving composition of functions. This method could be adopted by general mathematics teachers so that the mastery of their students will improve and by that the school will benefit since the learning of the students will increase particularly in mathematics. |
| ACTION RESEARCH QUESTION | | 1. What are the scores of the students exposed to traditional method as compared to simulation of color coded circles in solving composite functions? 2. Are there significant differences between the scores of the students exposed to traditional method as compared to simulation of color coded circles in solving composite functions? |
| ACTION RESEARCH METHODS | -PARTICIPANTS  and/ or SOURCES OF DATA INFORMATION  -DATA GATHERING METHODS  -DATA ANALYSIS | The respondents of this study were the grade eleven senior high school students who are identified to be develop in solving composite functions regardless of age and gender of General Tiburcio De Leon National High School located in the City of Valenzuela. They were asked to answer the test questionnaire. The researcher used three sections of which each was purposively selected.  This study used a multiple-choice teacher-made test questionnaire which included time sequence problems about composite functions that uses the strategy of simulation of color coded circles, these problems served as a pretest and posttest of the students. There were 10 items in the pretest and posttest that were administered to the groups of grade eleven senior high school students.  The following are observed in the gathering of data, a permission to conduct a study was secured from the Office of the Superintendent, Principal, and the Head of the Math Department in the Senior High School. Upon approval, the researcher personally gathered data in the pretest and the posttest performance of the senior high school student in the test. The data obtained from the test questionnaire were tabulated, organized, analyzed, and interpreted using weighted mean and analysis of the variance. |

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| ACTION RESEARCH WORK PLAN AND TIMELINES | |  |  |  | | --- | --- | --- | |  | ACTIVITIES | TIMELINE | | PRE-IMPLEMENTATION | 1. Identification of participants through early screening using teacher made test on composition of functions.  2. Secure approval from the principal and parent consent.  3. Orientation of identified students.  4. Administration of the validated test as pre-test. | 1st week of July 2020  2nd week of July 2020 | | IMPLEMENTATION PROPER | 5. Meet the participants during class hours.  6. Teach the students the concept of solving composite functions based from the competency.  7. Administer a test based on how the composite function is taught from the competency.  8. Teach the students the concept of simulation of color coded circles in solving composite functions as a proposed intervention strategy. | 3rd week of July 2020  3rd week of July 2020 | | POST-  IMPLEMENTATION | 9. Administration of the post test  10. Get a feedback from the students about the lesson.  11. Analyzing the results from pretest and posttest.  12. Sharing my paper in learning action cells.  13. Submitting my papers for free publication in the Schools Division Office and DepEd-NCR | 4th week of July 2020  August - September, 2020 | |
| COST ESTIMATES | |  |  |  |  | | --- | --- | --- | --- | | Item | Cost Per Unit (P) | Number | Total Cost (P) | | Questionnaire forms | ------- | ------ | ------- | | Office supplies for the project   * scissors * construction paper | 15.00  4.00 | 10 pcs  10 sheets | 150  80  **230.00** | | Report materials and supplies   * ink for printer | 400 | 1 set | 400  **400.00** | | Duplication services(reports)   * Post and pre-test * Worksheet * Letter for parent consent * Window card | 0.5  0.5  0.5  0.5 | 40 pcs  320 pcs  20 pcs  160 pcs | 20  160  10  80  **270.00** | | Field work | ----- | ----- | --- | | Purchase of books | ----- | ---- | ---- | | Subject/Research Participants   * food and beverages (snacks) | 30.00 | 90 | **2700** |   **TOTAL: 3600.00** |
| REFERENCES | Roberts, D. (2012). Composition of Functions. MathBitsNotebook.com.  https://betterexplained.com/articles/colorized-math-equations  Najera, J. (2019). Four Color Theorem. |
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