Learning Between the Lines: A Syncretistic Experiment in Mathematics and Visual Arts Education

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Summary:

- action research study examines students' perceptions of integrated learning in mathematics and visual arts
- it also documents their performance in secondary school
- findings from research show that students perceive that when mathematics and visual arts were integrated, new mathematical learning was reinforced considerably
- communication in mathematics in both written and oral was somewhat reinforced with math and art integration
- motivation to complete math assignments that were integrated with visual arts was enhanced
- according to the study, the perceptions above were shared by students of different genders, ages and mathematical ability
- the study concludes that an integrated approach to mathematics with visual arts should be used more often
- when integrating, the student lists three qualities it should possess: complexity, playfulness and universal appeal
- four elements were identified as key criteria for developing an integrated curriculum: creative space, adequate time, legitimate matter, and infectious energy

Examples of Integrated Mathematics and Visual Arts Assignments: (from the Article)

ASSIGNMENT #1: Ration, Proportion and the Golden Section

- centred around character of Pythagoras, the historical period of ancient Greece, and the art/math concept of the golden section rectangle/golden ratio
- in ancience Greece, the classical sculptors frequently used the navel (belly button) as the Golden Cut of the human body
- asks students to calculate their Golden Cut of their own body and compare it to sculptures such as Kouros
- students apply mathematic concept of golden ratio to various mini-assignments in art

ASSIGNMENT #2: Linear Relations

- application of mathematic concepts of slope and lines with Renaissance linear perspective and 17th century analytic geometry (Leonardo da Vinci and Rene Descartes)
- use those concepts to create their own art work

ASSIGNMENT #3: Geometric Patterning and Escher Tessellations

- apply concepts related to polygons, angles, translations, rotations, reflections to create art using tessellations

REFLECTION and APPLICATION to my own teaching practice:

This article/action research provides evidence that the integration of mathematics with visual arts can increase student engagement and conceptual understanding of mathematical concepts. This study was done at the secondary level, but can be applied to the middle school level. The sample assignments in the study can be modified to find it in the Grade 7 and Grade 8 curriculum. I intend to try a few of the ideas from this article to integrate some of the math and visual arts assignments in my class.