Demographic Aspects In The Use Of Music-Action Integration In Teaching Mitosis

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Abstract: Music and action integration had been used in a lot of pedagogical studies in the field of science education. This study sought to situatedemographic factors such as sex and educational background to use it as a tool in teaching mitosis. Using experimental- correlational design, the level of significance was identified using t-test for the performance based on the pre and posttests. Results showed that music-action integration was an effective tool in teaching mitosis compared to the traditional lecture discussion. Factors such as sex and educational background did not affect students' performance.

Introduction

Among the topics of junior high school Biology, cell division, photosynthesis, cell respiration, food chain, food web, and evolution are the topics that are difficult to teach and learn. Both teachers and students believe that cell division is the most difficult to learn among the topic (Oztap, Ozay, & Oztap, 2003). Many related studies have shown that students of different ages and in different grades all have poor understanding of cell division (Lewis, Leach, Wood-Roinson, 2000a, b; Lewis & Wood-Roinson, 2000; Smith 1991). Students had a poor understanding of cell division because they are not clear about the basic structures of genetics and therefore easily become confused about the terminologies (Lewis, Leach, Wood-Roinson, 2000a, b; Lewis & Wood-Roinson). The student will be able to develop a better understanding if the basic structure are clearly presented (Lewis, Leach, Wood-Roinson, 2000a, b; Lewis & Wood-Roinson). One of the most important and pervasive goals of schooling is to teach student to think. The over-reaching objective of science education at present is to produce science literate citizens; one who can think and react critically, analytically and scientifically (Tan, 2005). According to Thomas (2000), in the 20th century, advertisers have discovered that musical jingles help people remember their client's products. Educators, however, have been slower to recognize the importance of music in learning, as a result, most of us have thousands of commercial musical jingles in our long-term memory but relatively few school-related musical pieces. Music activities can be considered one type of instructional approach.Research supports the use of music as mnemonic device for learning of new information, in addition to the role of music in focusing attention and providing a motivating context for learning. Educational research also supports that we learn and retain information better when it is interesting and meaningful to use (Lazar, 2004).

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The value of music as a teaching tool lies in its potential to do the following: (1) tap the core intelligences of musical / rhythmic and emotional (interpersonal and intrapersonal), (2) engage both the left and right hemisphere, (3) appeal to the reptilian, limbic and neocortex layers of the brain to sense the nature of sounds, we act the music emotionally, and (4) manipulate students' Alpha and Beta brain waves to relax or alert them for learning(Waterhause's 2006a, 2006b).Berk 2008 on the other hand, mentioned 20 potential outcomes to ponder in knowing what the learning value of music to classroom included:grabbingstudent's attention; focusing students' concentration; generating interests in class and creating a sense of anticipation to mention a few. Music instruction imparts learning in the following ways: (1) Enhance fine motor skillsForgeard 2008; Hyde 2009; Schlaug et al. 2005. (2)Cultivate better thinking skills Rauscher 2000. (3) Boost reading and English language arts skills Baker 2011; Catterall 1998. (4)Equip students to be creative Lichtenberg, Woock &Weight 2008. On the other hand, kinesthetic activity can also be implemented together with the music instruction. According to Schneider (2011), Body movement helps to encode a mental concept, such as an unfamiliar foreign word or the spatial relationships implied by prepositions such as "over" or "behind." Students may memorize a concept or word in tandem with a gesture or movement. According to Exploring the Application of Multiple Intelligences Essay, "Bodily-kinesthetic intelligence: various organs of the body can be used for this intelligence like the use of fingers in counting or the use of body movements to show movements of letters in words, such as standing for vowel letters and standing down for consonant letters or translation of spelling words into sign language or gestures expression of specific words and concept of the lesson whereby students transfer lesson information from symbolic linguistic systems to bodily kinesthetic expressions, such as cell division or number subtraction." By repeating physical movements that represent a specific process or idea, students can gradually internalize the process or idea (Thomas Armstrong). Indeed, kinesthetic learning has powerful, underexploited applications not only for older children, but also for adults across the lifespan (Schneider 2011). The music action formula to learning deserves serious consideration by all faculty (Berk, 2008).The shared structure of emotional music and movement must be reflected in the organization of the brain. Consistent with this view, music and movement appear to engage shared neural substrates such as recruited by time-keeping and sequence learning.

Statement of the Problem

1. Is music-action integration an effective approach in teaching cell division: mitosis compared to the traditional lecture-discussion?
2. Do demographic factors specifically, sex and educational background affect learning the topic cell division: mitosis with music- action integration?

Methodology

Participants of the study weretwo heterogeneous first year students taking up Biological Science101 in Leyte Normal University, Tacloban City, Philippines. The study made use of a multiple-choice composed ofthirty item (30-item) questions related to cell division which wasa conglomeration from different standardized testfrom California Standards Test(Retrieved from http://www.cde.ca.gov/ta/tg/sr/resources.asp.), North Carolina Test of BiologyDivision of Accountability Services/North Carolina Testing Program Raleigh, North Carolina (Retrieved fromww.ncpublicschools.org) and California Standard Practice for Biology/ Life Science from McGraw-Hill Companies Inc. The same test questions but in different orders were given as pretest and posttest. T-test was used to identify whether posttest mean score was different from the pretest mean score thus determininghow significant the change of their pretest and posttest difference after the intervention (music-action integration).

Results and Discussion

Result of the study revealed that before the treatment, both the groups (control & experimental) had a very low knowledge in mitosis. The said result was in consonance with the results on the previous studies of Lewis et.al.1991.

Table1. Comparison of Pretest between Control and Experimental Groups

Groupings Pretest	N	Mean	Std. Deviation	Mean Difference	t-value	p-value	Interpretation (p<0.05)
Control	42	10.2045	2.71584	-.29978	-.527	.599	No significant difference
Experimental	42	9. 9048	2.55486				

*p<0.05= significant **p<0.01 = highly significant

Results showed that there was no significant difference between the pre-post mean score of control and experimental group. Thus, we can generalize that students exposed in music-action performed better than students exposed to traditional lecture discussion. Indicating that the integration of music action in teaching mitosis was effective compared to the traditional lecture discussion.

Table 2. Comparison between Performance Before and After the Treatments among the Control and Experimental Group

Groups	N	Pretest Mean Score	Posttest Mean Score	Difference Pre-post Mean Value	Difference Pre-Post Standard Deviation	t-value	p-value	Interpretation (p<0.05)
Control	44	10.2045	15.5227	-5.3182	3. 92234	-4.482	.000**	Highly significant
Experimental	42	9.9048	18.8810	-8.9762	3.64583			

*p<0.05= significant **p<0.01 = highly significant

Result showed that the p-value of female and male .923 is greater than 0.05 (.923>0.05), thus there was no significant difference. The null hypotheses (H0) which states that there is no significant difference between the mean scores of male students and female students, is not rejected. It indicates that male and female performed correspondingly in learning mitosis with music-action integration.

Table 3. Demographic Factors of the Respondents considered between Pretest-Posttest Results

Difference Pre-post		N	Mean	Std. Deviation	t-value	p-value	Interpretations (p< 0.05)
Sex	Female	29	-8.9310	2.98725	.098	.923	No significant difference
	Male	13	-9.0769	4.95751			
Educational Background	Private	2	-6.5000	2.12132	1.616	.305	No significant difference
	Public	40	-9.1000	3.67807			

*p<0.05= significant **p<0.01 = highly significant

The result shows that the p-value of female and male .923 is greater than 0.05 (.923>0.05), thus there is no significantdifference.It indicated that male and female performed correspondingly in learning mitosis with music-action integration. It revealed that students from public and private schools performed equally in learning Mitosis with music-action integration. Accordingly, sex (male & female) and educational background (graduated from public & private high school) does not affect the students learning mitosis with the use of music-action integration.

Conclusion

Based on the findings of this research, the following conclusions are made (1) Music-action integration is an effective approach in teaching mitosis compared to traditional lecture discussion. (2) Demographic factors specifically sex and educational background do not affect the learning of the topic cell division: mitosis with the music-action integration.

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