Examination of Students' Motivational Styles and Their Experience of a Gamified Exercise in Histology

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BACKGROUND

Gamifcation of classroom activities in higher education and anatomy have been shown to lower stress levels of students and increase learning, as well as increase participation.

Motivational styles for gaming can allow tailoring of the game elements to reach a variety of learning styles and increase positive benefits of the game.

This is the first study done on the benefits and motivational styles of doctor of chiropractic students.

OBJECTIVES

- To determine the affects of using a gamification strategy in histology to review lab material
- To examine motivational styles driving enjoyment of the game and learning in the course

METHODS

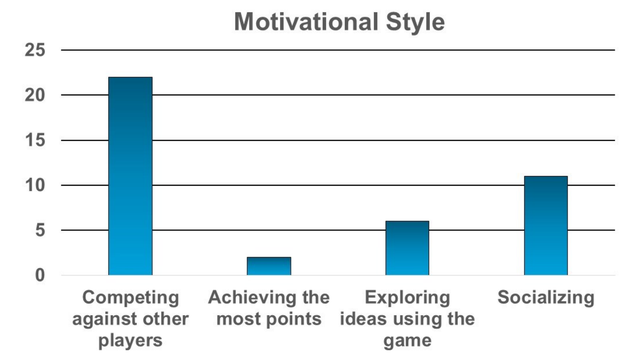
Two different cohorts were surveyed following 10 weeks of participation in the marble game (Spring '19 and Summer '19). Following the marble game, the students were given a 30-question survey including their motivations for playing the marble game, perceptions of their learning and stress levels regarding course material. Most of these questions were scored using a 1-5 Likert scale (1: strongly disagree, 2: disagree, 3: neither agree or disagree, 4: agree, 5 strongly agree); some were open-ended response questions.

There were 111 responses in the Spring '19 group and 45 responses in the Summer '19 group. Each participant responded to 30 questions that were tallied and correlations between lower stress and higher learning and others were examined. Statistics and significance were prepared and calculated using a Two-Tailed T-test. Content analysis was performed for the open-ended questions.

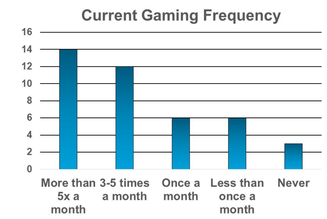
THE MARBLE GAME

- Students play in teams of 10-14
- Lab performed, game played following week at beginning of lab
- Marbles awarded for correct answers to review questions, contribution to course materials and acts of professionalism
- Winners receive free lunch party

Students' prime motivators were competition and socialization.



A majority of our students are regular gamers.



STUDENT FEEDBACK

Positives:
- Viewed competition as a positive learning tool
- Socialization and teamwork aspect
- Was fun and created positive environment
- Low-stakes, risk free environment
- Review and instant feedback helpful
- Was not tied to class points

Could use improvement:
- Should be tied to class points
- More review of lecture content as well as lab
- Total marbles won should be limited per group

DEMOGRAPHICS

	Spring 2019	Summer 2019
Male	70 (63%)	23 (51%)
Female	40 (36%)	21 (47%)
Average Age	27	27
White students Students of color	96 (84.2%) 14 (15.8%)	35 (79.6%) 9 (20.4%)

The risk free environment correlated positively with reported confidence in the course material.

Descriptive Statistics		Mean	St. Deviation	N
Spring 2019 Cohort	Risk Free Environment	3.26	0.945	104
	Contributed to Feeling Competent	3.25	0.983	104
Summer 2019 Cohort	Risk Free Environment	3.27	0.867	41
	Contributed to Feeling Competent	3.54	0.809	41

Likert scale 3: neither agree or disagree, 4: agree

Correlations			Contributed to Feeling Competent
Spring 2019 Cohort	Risk Free Environment	Pearson Correlation	0.201
		Sig (2-tailed)	0.041 *
			104
Summer 2019 Cohort	Risk Free Environment	Pearson Correlation	0.396
		Sig (2-tailed)	0.010 *
			41

* Correlation is significant at the 0.05 level

CONCLUSIONS

- Lowered stress, increased feelings of interest, engagement and confidence in histology.
- The feeling of a risk-free environment during the game correlated positively with feelings of competence about the course material.
- Competition and social interaction were the highest motivators.
- This exercise demonstrates that gaming can be a useful learning tool for students in higher education.