3rd WCPE
World Conference on Physics Education
Hanoi, Vietnam, 13 - 17 December 2021
3RD WORLD CONFERENCE ON PHYSICS EDUCATION
Innovating physics education: From research to practice

IMPROVING WOMEN MOTIVATION IN LEARNING PHYSICS

AUTHORS

Héctor Reyes Martín (Physics and Chemistry Department, International High School J.H.Newman, Madrid, Spain)

Juan Manuel García González (Sociology Department, Pablo de Olavide University, Seville, Spain)

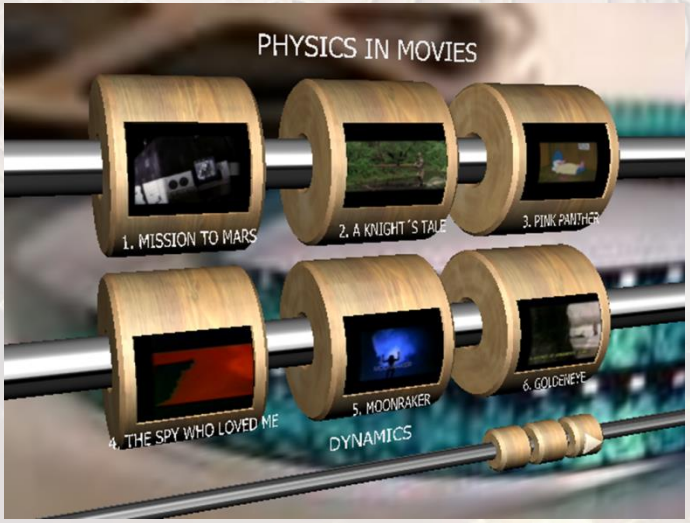
José Antonio Mirón Canelo (Department of Biomedical Sciences. Researcher at the Institute of Biomedical Research of Salamanca (IBSAL), Faculty of Medicine, University of Salamanca, Spain).

COLEGIO INTERNACIONAL
J.H. NEWMAN

INTRODUCTION

It is necessary to find relationships between Physics and other branches of knowledge, such as Mathematics, Biology, Philosophy, History [1] , Geography and Music, among others.

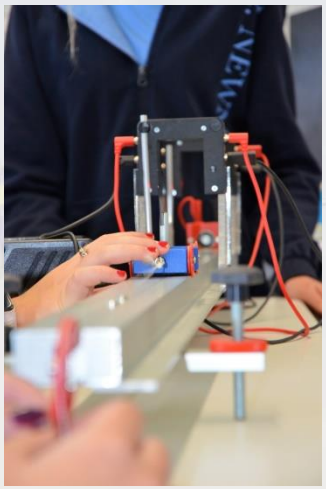
Transversality is inherent in the process of acquiring knowledge. Thus, the BBTA applied is based on the implication of the students in their own learning process [2].



METHODS

The AMS test is used in this study. Vallerand et al. [3] suggested different motivation factors:

Intrinsic Motivation to Know (IMTK)
Intrinsic Motivation to Accomplish (IMTA)
Intrinsic Motivation to Experience Stimulation (IMES)
Extrinsic Motivation for External Regulation (EMER)
Extrinsic Motivation for Introjected Regulation (EMIN)
Extrinsic Motivation for Identified Regulation (EMID)
Amotivation (AMOT)



We analyze the motivations of students who learnt with a Brain-Based Teaching Approach (BBTA) methodology (Socratic style) were compared to a sample who had learnt in a masterclass style.

RESULTS

Table 1. Characteristics of the sample groups by sex and age.

		BBTA method			Classic method		
	Age	Male	Female	Total	Male	Female	Total
Course 1	15-16	19	12	31	19	12	31
		61%	39%	100%	61%	39%	100%
Course 2	16-17	9	12	21	17	21	38
		43%	57%	100%	45%	55%	100%
Course 3	17-18	8	9	17			
		47%	53%	100%			
Total		36	33	69	36	33	69
		52%	48%	100%	52%	48%	100%

Table 2. Kurtosis-Symmetry (K-S) and Shapiro-Wilk (S-W) normality tests (p-values) of women samples, T-test (parametric) / U Mann-Whitney test (non parametric)

	BBTA method		Classic method		T test	U Mann-Whitney test
	K-S	S-W	K-S	S-W		
IMTK	.142	.092	.077	.368	**.032**	
IMES	.282	.241	.856	.626	.199	
IMTA	.814	.893	.198	.051	.868	
AMOT	.046	.000	.005	.000		.686
EMER	.328	.293	.008	.000	**.000**	**.000**
EMID	.087	.051	.013	.000	**.013**	**.019**
EMIN	.619	.620	.278	.522	**.012**	

CONCLUSIONS

In light of the results obtained, the BBTA group has fewer extrinsic motivations than the classic group and more intrinsic motivations, especially for the pleasure of learning. Women from the BBTA group show significantly higher interest in learning Physics than women from the classic group. This BBTA method could be a strategy to follow in order to involve women in Science.

REFERENCES

[1] Petitto, L. A., & Dunbar, K. N. (2009). Educational Neuroscience: New Discoveries from Bilingual Brains, Scientific Brains, and the Educated Mind. Mind, brain and education : the official journal of the International Mind, Brain, and Education Society, 3(4), 185–197. https://doi.org/10.1111/j.1751-228X.2009.01069.x

[2] Reyes, H., García, J. M., Mirón, J. A. (2021). European Journal of Education and Psychology; Vol. 14 No. 1: January-June 2021; 1-18. https://doi.org/10.32457/ejep.v14i1.1550

[3] Vallerand, R., Pelletier, L., Blais, M., Briere, N., Senecal, C., & Vallieres, E. (1992). The Academic Motivation Scale: A Measure of Intrinsic, Extrinsic, and Amotivation in Education. Educational And Psychological Measurement, 52(4), 1003-1017. https://doi.org/10.1177/0013164492052004025

THANK YOU!

hreyes@colegionewman.org