“Students, Computers and Mathematics: The Golden Trilogy in the Teaching-Learning Process”

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Research Questions

What is the students' attitude toward the use of computers in the teaching of mathematics?

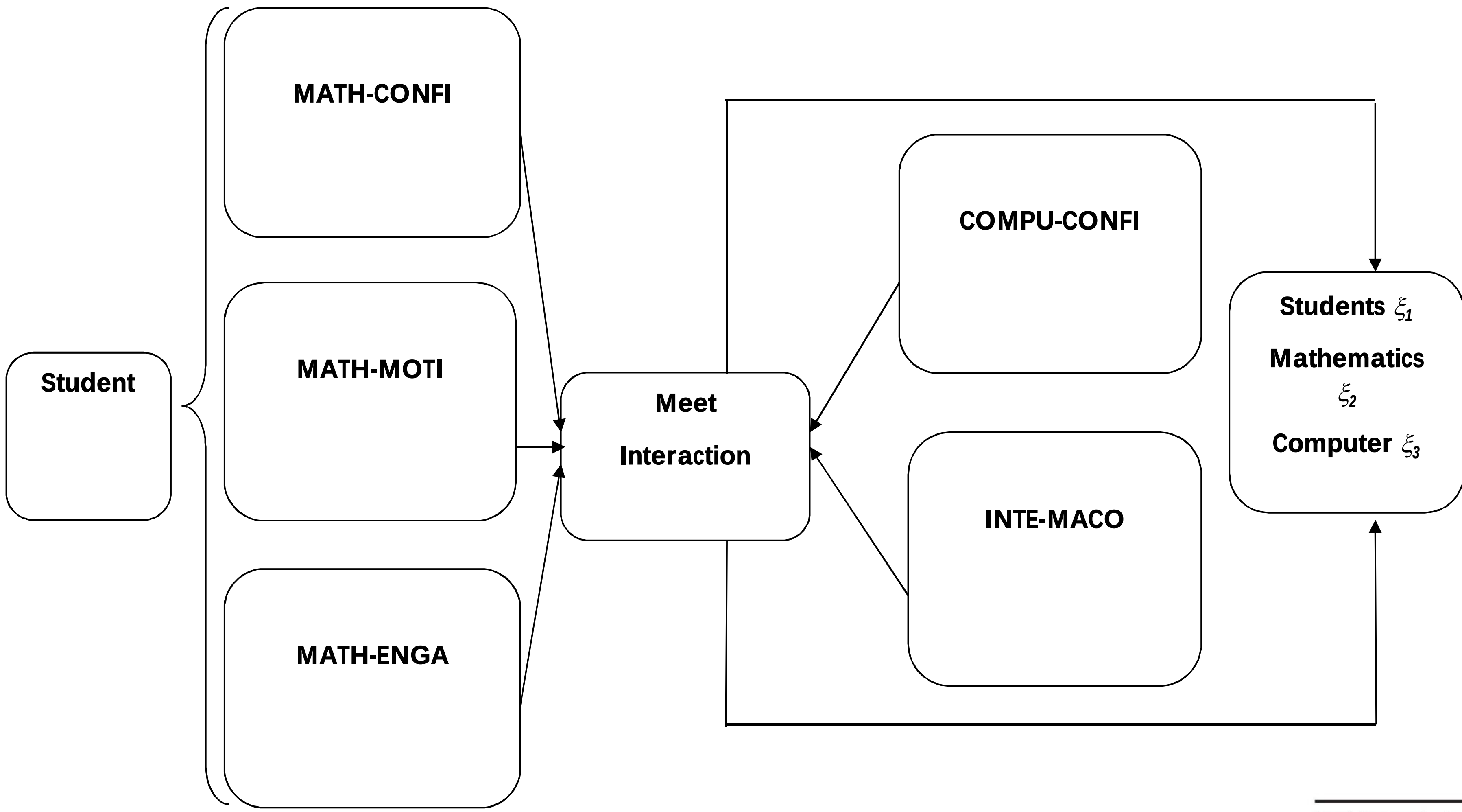
What is the students' attitude toward mathematics confidence, motivation and engagement?

How is this interaction between computer and mathematics achieved in the teaching process?

Objective

The objective of this study was to measure, how mathematics confidence, mathematics motivation, computer confidence, computer motivation, computer-mathematics interaction and mathematics engagement help to understand the students' attitude toward mathematics and technology.

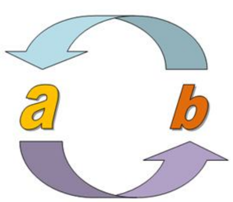
Theoretical model



Hypothesis

Null Hypothesis H_O: There are no factors that contribute to understand the students' attitude towards mathematics and technology.

Alternative Hypothesis H_1: There are factors that contribute to understand the students' attitude towards mathematics and technology.



Test –population and sample

SCALE (Galbraith and Hines, 2000)	ITEMS
Confidence Toward Mathematics	8
Mathematics Motivation	8
Engagement Mathematics	8
Computer Confidence	8
Computer Interaction and Mathematics.	8
TOTAL	40

- ✓ Lickert scale, the range on this scale ranged from 1 (low) to 5 (very high).
- ✓ Were surveyed 303 students (Questionnaires)

Scales Sample

Mathematics Confidence	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
Mathematics is a subject in which I get value for effort					
The prospect of having to learn new mathematics makes me nervous					
I can get good results in mathematics					
I am more worried about mathematics than any other subject					
Having to learn difficult topics in mathematics does not worry me					
No matter how much I study, mathematics is always difficult for me					
I am not naturally good at mathematics					
I have a lot of confidence when it comes to mathematics.					
Mathematics Motivation	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
Mathematics is a subject I enjoy doing					
Having to spend a lot time on a mathematics problem frustrates me					
I don't understand how some people can get so enthusiastic about doing mathematics					
I can become completely absorbed doing mathematics problems					
If something about mathematics puzzles me, I would rather be given the answer than have to work it out myself					
I like to stick at a mathematics problem until I get it out					
The defy of understanding mathematics does not appeal to me					
If something about mathematics puzzles me, I find myself find about it afterwards.					

Metodology

Table 1 Students majoring in the UCC

Majoring	Frequency	Percentage
Management	49	16.2
Accounting	42	13.9
Economy	26	2.0
Marketing	35	11.6
(IBM) -MNI	85	28.1
Tourism	66	21.8
Total	303	100.0

Source: Self-made

- **Reliability (was used software SPSS)**
- **Alpha de Cronbach 0.629**

Results

Table 1 Matrix correlations

	Variables	Math confidence	Math-Motivation	Math-Engagement	Comp-Confidence	Computer-Math-Interaction
Correlation	Math confidence	1.000	.271	.114	-.104	.178
	Mathematics Motivation	.271	1.000	.193	.145	.307
	Mathematics Engagement	.114	.193	1.000	.162	.148
	Computer confidence	.104	.145	.162	1.000	.220
	Computer-Mathematics Interaction	.178	.307	.148	.220	1.000
Sig. (Unilateral)	Math confidence		.000	.024	.036	.001
	Mathematics Motivation	.000		.000	.006	.000
	Mathematics Engagement	.024	.000		.002	.005
	Computer confidence	.036	.006	.002		.000
	Computer-Mathematics Interaction	.001	.000	.005	.000	
Bartlett's test of Sphericity				92.70374 (α=0.00) df 10		
Measure of sampling adequacy (overall) (KMO)				. 668		

Source: self-made.

Results

Table 2 Measure of sampling adequacy KMO (overall) and partials correlations

Variable	Math confidence	Math-Motivation	Math-Engagement	Comp-Confidence	Computer-Math-Interaction
Math confidence	**.682**[a]	-.072	-.185	-.583	-.044
Mathematics Motivation	-.072	**.639**[a]	-.392	.091	.376
Mathematics Engagement	-.185	-.392	**.716**[a]	-.221	-.018
Computer confidence	-.583	.091	-.221	**.688**	.085
Computer-Mathematics Interaction	-.044	.376	-.018	.085	**.660**[a]

Source: self- made

Results

Table 3 Component Matrix and Communalities

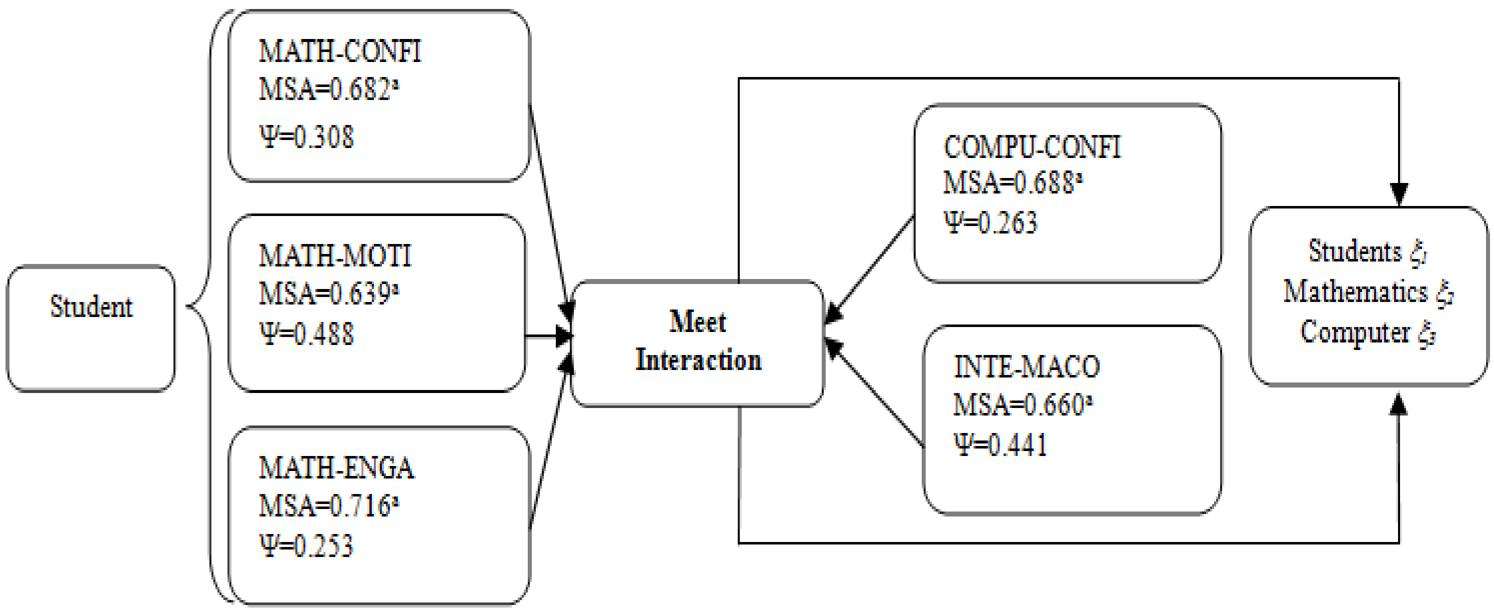
	Component 1	Communalities
Math confidence	.555	.308
Mathematics Motivation	.698	.488
Mathematics Engagement	.503	.253
Computer confidence	.513	.263
Computer-Mathematics Interaction	.664	.441
Eigenvalues	1.753	
% Variance	35.057	

Source: self-made

Results

Figure 2 Theoretical Path Model validated

Student – Mathematics	Student - Computer	Variable that explains students' perception



KMO=0.703 $X^2_{calculated}$ = 92.928 with 10 df > X^2_{tables} p=<0.01, α=< 0.01 Eigenvalues 1.753 = %35.057 total variance

Ψ= communalities, MSA= Measure sampling adequacy, r= correlation among variables

Source: self-made

Conclusions

The results provide empirical evidence to assert that there is a relationship between the factors proposed by Galbraith and Hines explaining the attitude towards mathematics and technology in college students.

In addition the professors that impart this matter must do not only have the knowledge, but also abilities which make it possible the implementation of didactic actions, so that the teaching-learning process can be better, in order to strengthen the student's attitude.

The results show overall a positive attitude towards mathematics and technology by the student.

Math confidence, Mathematics Motivation, Mathematics Engagement, Computer confidence, Computer-Mathematics Interaction, help us to understand the students attitude towards mathematics and technology.

LAST

All comments and suggestions are welcome....

Any question, send mail to: agarcias@ucc.mx will be responded by Arturo Garcia (main researcher)

¡THANK YOU FOR YOUR ATTENTION¡

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