

## ORIGINAL ARTICLE

## MOTIVATION OF HEALTHY AREA STUDENTS IN DISCIPLINES THAT ARE 100% DISTANCE EDUCATION: SOCIOECONOMIC INFLUENCE\*

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### ABSTRACT

**Objective:** to evaluate whether the socioeconomic characteristics of health area students affect motivation in the use of Digital Information and Communication Technologies.

**Method:** an analytical study was carried out in 2015 with 713 undergraduate students of the health area. The Scale of Evaluation of Motivation Factors with regard to the Integration of Information and Communication Technologies into Teaching was applied in a teaching institution of the metropolitan region of São Paulo.

**Results:** the Demotivation factor was significant among students with stable partners. Lower family income positively affected the External Control and Internal Control factors. The initial semesters of the courses presented higher means in external control, internal control, control by identification and intrinsic motivation.

**Conclusion:** the knowledge of the relationship between the socioeconomic characteristics and the motivation factors of students in distance education disciplines contributes to the planning of personalized and contextualized approaches in higher education.


**DESCRIPTORS:** Distance Education; Higher education; Information Technology; Communication; Motivation.


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## **MOTIVAÇÃO DE ALUNOS DA ÁREA DA SAÚDE EM DISCIPLINAS TOTALMENTE A DISTÂNCIA: INFLUÊNCIA SOCIOECONÔMICA**

### **RESUMO**

*Objetivo:* avaliar se as características socioeconômicas de alunos da saúde interferem na motivação no uso das Tecnologias Digitais da Informação e Comunicação.

*Método:* estudo analítico realizado em 2015 com 713 alunos de graduação da área de saúde. Foi aplicada a Escala de Avaliação de Fatores de Motivação com Relação à Integração das Tecnologias de Informação e Comunicação ao Ensino em uma instituição de Ensino da Região metropolitana de São Paulo.

*Resultados:* houve significância para o fator Desmotivação entre estudantes com companheiro estável. Menor renda familiar interferiu positivamente nos fatores Controle Externo e Controle Interno. Os semestres iniciais dos cursos implicaram em maiores médias no controle externo, controle interno, controle por identificação e na motivação intrínseca.

*Conclusão:* o conhecimento da relação entre as características socioeconômicas e os fatores de motivação de estudantes em disciplinas totalmente a distância contribui para o planejamento de abordagens personalizadas e contextualizadas no ensino superior.

**DESCRITORES:** Educação a Distância; Educação Superior; Tecnologia da Informação; Comunicação; Motivação.

## **MOTIVACIÓN DE ALUMNOS DEL ÁREA DE SALUD EN ASIGNATURAS ENTERAMENTE A DISTANCIA: INFLUENCIA SOCIOECONÓMICA**

### **RESUMEN:**

*Objetivo:* evaluar cuánto las características socioeconómicas de alumnos del área de la salud influyen en la motivación en el uso de las Tecnologías Digitales de la Información y Comunicación.

*Método:* estudio analítico que se realizó en 2015 con 713 alumnos de enseñanza superior en área de salud. Se utilizó la Escala de Evaluación de Factores de Motivación con Relación a la Integración de las Tecnologías de Información y Comunicación a la Enseñanza en una institución de Enseñanza de la Región metropolitana de São Paulo.

*Resultados:* hubo significancia para el factor Desmotivación entre estudiantes con pareja estable. Menor renta familiar influyó positivamente en los factores Control Externo y Control Interno. Los semestres iniciales de los cursos presentaron mayores promedios en el control externo, control interno, control por identificación y en la motivación intrínseca.

*Conclusión:* el conocimiento acerca de las características socioeconómicas y los factores de motivación de estudiantes en asignaturas enteramente a distancia contribuye para el planeamiento de abordajes personalizados y contextualizadas en la enseñanza superior.

**DESCRIPTORES:** Educación a Distancia; Enseñanza Superior; Tecnología de la Información; Comunicación; Motivación.

## INTRODUCTION

Distance Education (DE) can be defined as a teaching-learning process mediated by digital tools, in which teachers and students are separated in space and/or time, however, can be connected through technologies, especially telematics, such as the internet<sup>(1-2)</sup>.

Digital Information and Communication Technologies (DICTs) contribute to DE and allow the transmission, dissemination, transformation, storage, communication and creation of contents that may or may not be linked to a more dynamic, collaborative and interactive teaching methodology<sup>(1)</sup>.

Accordingly, in a world in constant transformation, the role of the teacher needs to be reviewed in order to produce presential and/or distance educational practices that prevail through pedagogical mediation between the subjects and the objects of knowledge in the digital age. It is teaching in "beta mode"<sup>(3)</sup>, that is, permanently unfinished and has many potentialities and many challenges to be consolidated.

In Brazil, the Law of Guidelines and Bases 9.394/96 (Lei de Diretrizes e Bases) regulated the accreditation of institutions to offer distance education courses or programs, for youth and adult fundamental education and high school and higher professional education<sup>(4)</sup>. The Ministry of Education is responsible for institutional accreditation, supervision, monitoring and evaluation related to quality standards<sup>(5)</sup>.

Decree 9.057/2017 represented a new regulatory framework for DE in Brazil and regulates the possibility of offering higher undergraduate and postgraduate distance education courses. However, it does not allow a fully virtual formation and the evaluations, training and laboratory classes still remain in the presential mode<sup>(6-7)</sup>.

Distance Education has become commonplace due to the omnipresence of DICTs. It is necessary to understand that the student must have a minimum digital physical structure to guarantee access at different times and in virtual and presential spaces<sup>(8-9)</sup>.

Learning in virtual environments requires the student's availability, commitment, organization for study, intellectual maturity and self-knowledge of their own needs and limits<sup>(1,9)</sup>. However, motivation can vary between intrinsic, in which the individual feels self-determined to carry out an activity, and extrinsic, when there is concern for the fulfillment of a task for external rewards<sup>(10)</sup>.

In education, motivation is associated with the involvement of students in challenges, with the variety of strategies and with the development of tasks that positively contribute to learning<sup>(11)</sup>. Motivation in the use of DICTs, however goes beyond the individual dimension and encompasses the socioeconomic context, as the Brazilian reality reveals social inequalities that compromise access to goods and services, such as education and technological advances<sup>(12)</sup>.

Based on this educational scenario in constant transformation, the aim was to evaluate whether the socioeconomic characteristics of health students affect the motivation in the use of DICTs.

## METHOD

An analytical cross-sectional study was carried out from May 2015 to September 2015, in which the dependent variable was motivation in the use of DICTs in the teaching and the independent variables were the socioeconomic characteristics of students of a private Higher Education Institution (HEI) in São Paulo.

There were a total of 22 distance education subjects, with 19 of these offered in

the undergraduate health courses, with the Modular Object-Oriented Dynamic Learning Environment (Moodle) being the virtual learning environment used. The students had to complete four to six disciplines of this type of teaching in their formation.

These disciplines followed a structure of eight units with two classes each and with textual content only in Portable Document Format (PDF). At the end of each unit, the student responded to a test with ten multiple choice questions, each with five alternatives. Forums and contextualized activities (elaboration of text on specific topics) complemented these teaching strategies.

The representative sample was calculated for the population of each course, using the STATS 2.0 statistical program, considering a maximum acceptable percentage of error of 5%, an estimated percentage level of 50% and a confidence level of 95%. Considering the populations of 656 Nursing students, 234 Biomedicine students, 361 Physical Education students and 220 Pharmacy students, the representative minimum samples obtained were: 242, 145, 186 and 140 students, respectively.

The students were recruited by the researcher during the classes and with the authorization of the professors of the presential disciplines. Inclusion criteria were: to be aged 18 years or over, to have studied a distance learning discipline at the HEI of the study and to be between the 2nd and 8th semester of the course.

The Scale of Evaluation of Motivation Factors with regard to the Integration of Information and Communication Technologies into Teaching (Echelle de motivation lor de l'intégration des technologies de l'information et des communications dans l'enseignement - EMITICE) was used, this being a psychometric instrument based on the Self-Determination Theory, which aims to comprehend the components of intrinsic motivation, extrinsic motivation and demotivation<sup>(10)</sup>. Accordingly, the personality and human motivation are concentrated in evolutionary tendencies, in innate psychological needs, in favorable conditions for motivation, in social functioning and in personal well-being<sup>(13)</sup>.

To understand the dimensions of the EMITICE, the authors<sup>(13)</sup> state that intrinsic motivation refers to the drive to do something where the interest in the action is pleasing to the individual and is in accordance with his/her values, needs and wants. Demotivation, on the other hand, refers to the absence of this impulse. External control is related to behaviors regulated by interest in an external reward, while internal control is characterized by the internalization of an external source of motivation as a way to satisfy the need for acceptance or self-esteem. The control by identification factor represents the actions taken by the individual when there is no possibility of choice, given the context in which he/she is inserted.

Although the EMITICE refers to the general use of DICTs in the university environment, in this study the participants answered the questionnaire with a focus on the use of the DICTs in the online disciplines offered by the HEI. The scale presents 20 statements and was applied, as proposed by the validation study of the original scale in French, with the items randomized.

The scale items are evaluated on a 7-point Likert type response scale: (1) Does not correspond at all, (2) Corresponds very little, (3) Corresponds somewhat, (4) Corresponds moderately, (5) Corresponds quite a bit, (6) Corresponds strongly and (7) Corresponds completely<sup>(13)</sup>.

The scale has five factors: Demotivation (items 3, 8, 13, 18), External Control (6, 11, 16), Internal Control (4, 9, 14, 19), Control by Identification (2, 7, 12, 17) and Intrinsic Motivation (1, 5, 10, 15, 20). The total score is obtained by the sum of the responses and after the recoding of the items of the Demotivation factor. The total score varies from 20 to 140, with higher total scores equating to greater motivation in the use of DICTs in distance education<sup>(13)</sup>.

The participant characterization questionnaire contains six items on socioeconomic

and academic characteristics (gender, age, marital status, family income, course and semester).

Descriptive data analysis was performed through absolute and relative frequencies, central tendency (mean and median) and dispersion (standard deviation, minimum and maximum values). Regarding the inferential analysis, the normality of the EMITICE total score and of the factors were evaluated through the Kolmogorov-Smirnov test; as they did not present normal distribution, nonparametric tests were applied. In the comparison of the scores the Mann-Whitney test was applied and, in the comparison with variables with three groups or more, the Kruskal-Wallis test was used. In the latter case, when a significant difference was observed, Dunn's post hoc test was applied.

In the comparison between quantitative variables Spearman's correlation test ( $r$ ) was used. The reference values for the magnitude were:  $r = 0.10$  to  $0.39$ , weak;  $r = 0.40$  to  $0.69$ , moderate;  $r = 0.70$  to  $1$ , strong<sup>(14)</sup>.

A descriptive level of 5% ( $p < .05$ ) was assumed for significance. Data were entered in Excel® and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0 for Windows® and GraphPad.

It should be noted that in this study, due to missing data, for some variables the mode data imputation process was used<sup>(15)</sup>, with no differences in the distribution of measures of central tendency and dispersion of the variables, since the losses ranged between 0.1% and 1.8%.

The present study was approved by the Research Ethics Committee of the University of Guarulhos under authorization number 512.813.

## RESULTS

A total of 713 students with mean age of 26.6 years ( $\pm 7.1$ ), 64.6% female, 70% single and with a mean family income of 3.9 minimum wages, participated in the study (Table 1).

Table 1 - Number and percentage of students, according to socioeconomic and academic characteristics (n = 713). Guarulhos, SP, Brazil, 2016 (continues)

| Variable and Categories | n   | %    | Variable and Categories | n   | %    |
|-------------------------|-----|------|-------------------------|-----|------|
| Sex*                    |     |      | Semester**              |     |      |
| Female                  | 461 | 64.6 | 2nd                     | 98  | 13.7 |
| Male                    | 252 | 35.4 | 3rd                     | 155 | 21.7 |
| Marital status          |     |      | 4th                     | 145 | 20.3 |
| Single                  | 499 | 70.0 | 5th                     | 121 | 17.0 |
| Married                 | 156 | 21.9 | 6th                     | 54  | 7.6  |
| Stable union            | 24  | 3.4  | 7th                     | 100 | 14.0 |
| Separated               | 7   | 1.0  | 8th                     | 40  | 5.6  |
| Divorced                | 26  | 3.6  | Course                  |     |      |
| Widowed                 | 1   | 0.1  | Biomedicine             | 145 | 20.3 |
|                         |     |      | Physical Education      | 182 | 25.5 |

|       |     |     |       |          |     |      |
|-------|-----|-----|-------|----------|-----|------|
|       |     |     |       | Nursing  | 246 | 34.5 |
|       |     |     |       | Pharmacy | 140 | 19.6 |
| Total | 713 | 100 | Total |          | 713 | 100  |

Note: \* imputation 0.4% of the variable; \*\* imputation 0.1% of the variable

Considering the mean values of central tendency and dispersion for each item that comprises the EMITICE score, the highest median values were for the four items that comprise the Demotivation factor, showing that the students had the impression of wasting time doing the on-line discipline, and did not understand the relevance of learning with the technologies, the reason for DICTs requests in the academic work or the use of DICTs in the classes. The items with lower mean scores indicate that the students used DICTs more due to obligation than for pleasure (Table 2).

Table 2 - Descriptive analysis of the items of the EMITICE instrument (n = 713). Guarulhos, SP, Brazil, 2016 (continues)

| Item | Variables  | Mean | SD  | Median |
|------|--|------|-----|--------|
| 3    | I have the impression I am wasting my time using ITC.*                                       | 4.8  | 1.7 | 5      |
| 8    | I do not understand the relevance of learning with the technologies.§§                       | 4.7  | 1.7 | 5      |
| 18   | I do not know why I use ICT in my university classes.**                                      | 4.7  | 1.9 | 5      |
| 13   | I do not see why we are being asked to use ICT in our work.***                               | 4.6  | 1.7 | 5      |
| 2    | In my view, knowledge of ICT will help me better prepare for my future profession.§          | 4.0  | 1.7 | 4      |
| 12   | This will help me to be better prepared and instrumentalized for the career I have chosen.** | 4.0  | 1.7 | 4      |
| 17   | I believe that better command of ICT will increase my professional competence.               | 4.0  | 1.7 | 4      |
| 19   | In our time, we must use ICT in education.   | 4.0  | 1.7 | 4      |
| 11   | It is a differential to get a stable job at the end of my studies.¥¥                         | 3.9  | 1.7 | 4      |
| 20   | Learning with the help of ICT is interesting.  | 3.9  | 1.7 | 4      |
| 7    | For me, ICT is an essential tool for my formation.***  | 3.8  | 1.7 | 4      |
| 9    | In my view, mastering ICT will allow me to feel important and competent.¥¥¥                  | 3.7  | 1.6 | 4      |
| 16   | This will make my work more interesting.§  | 3.7  | 1.6 |        |
| 4    | To prove to myself that I can learn from ICT.****  | 3.6  | 1.6 | 4      |
| 10   | Learning through ICT is stimulating.¥  | 3.6  | 1.7 | 4      |
| 14   | To prove to myself that I am an intelligent person, able to learn through ICT.§§§            | 3.6  | 1.6 | 4      |
| 15   | For the pleasure of carrying out projects or projects with the help of ICT.**                | 3.6  | 1.6 | 4      |
| 5    | I really like using ICT.§§§  | 3.5  | 1.7 | 4      |
| 6    | There are no other ways to do well in certain courses at the University.                     | 3.4  | 1.7 | 4      |



|   |                               |     |     |   |
|---|-------------------------------|-----|-----|---|
| 1 | I take pleasure in doing it.* | 3.2 | 1.6 | 3 |
|---|-------------------------------|-----|-----|---|

Note: \* imputation 0.1% of the variable; \*\* imputation 0.3% of the variable; \*\*\* imputation 0.4% of the variable; \*\*\*\* imputation 0.8% of the variable; ¥ imputation 1.0% of the variable; ¥¥ imputation 1.1% of the variable; ¥¥¥ imputation 1.3% of the variable; § imputation 1.4% of the variable; §§ imputation 1.7% of the variable; §§§ imputation 1.8% of the variable; The term Information and Communication Technology (ICT) was proposed by the author of the instrument, however, refers directly to DICTs

The mean EMITICE total score in the sample was 78.5 ( $\pm$  20.4), below the midpoint of the instrument (80), which corresponds to low to moderate motivation. Once normalization to 100 was performed to allow comparison between the factors, it was possible to identify that the Demotivation factor obtained the highest score. Low Intrinsic Motivation was observed compared to the other factors (Table 3).

Table 3 - Descriptive analysis of the factors and total score of the EMITICE instrument (n = 713). Guarulhos, SP, Brazil, 2016

| Variables                 | No. of items | Mean | Normalization to 100 | SD   | Median | Minimum | Maximum |
|---------------------------|--------------|------|----------------------|------|--------|---------|---------|
| Total Score               | 20           | 78.5 | 56.1                 | 20.4 | 80     | 22      | 140     |
| Factors                   |              |      |                      |      |        |         |         |
| Demotivation              | 4            | 18.7 | 66.8                 | 5.4  | 19     | 4       | 28      |
| External control          | 3            | 11.1 | 52.9                 | 4.1  | 11     | 3       | 21      |
| Internal control          | 4            | 15   | 53.6                 | 5.3  | 16     | 4       | 28      |
| Control by identification | 4            | 15.7 | 56.1                 | 5.8  | 16     | 4       | 28      |
| Intrinsic motivation      | 5            | 17.8 | 50.9                 | 6.7  | 18     | 5       | 35      |

The student's age variable did not present a significant correlation with the scores of the factors: Demotivation ( $r = 0.02$ ,  $p = .55$ ), External Control ( $r = -0.00$ ,  $p = .96$ ), Internal Control ( $r = -0.05$ ,  $p = .17$ ) and Intrinsic Motivation ( $r = -0.01$ ,  $p = .76$ ).

There was a significant difference for the marital status and course variables with the Demotivation factor. For marital status, there was higher mean in demotivation when there was a stable partner. For the course, greater demotivation was observed in the Pharmacy course in relation to the Biomedicine course (Table 4).

Table 4 - Significant comparison of the socioeconomic variables according to the scores in the factors of the EMITICE instrument (n = 713). Guarulhos, SP, Brazil, 2016 (continues)

| Variables       | n   | Mean | SD  | Median | Minimum | Maximum | P-value |
|-----------------|-----|------|-----|--------|---------|---------|---------|
| Marital status* |     |      |     |        |         |         |         |
| Without partner | 533 | 18.6 | 5.4 | 19     | 4       | 28      | 0.03    |
| With partner    | 180 | 19.7 | 5.2 | 20     | 4       | 28      |         |

|                           |     |      |     |      |   |    |      |
|---------------------------|-----|------|-----|------|---|----|------|
| Course                    |     |      |     |      |   |    |      |
| Biomedicine               | 145 | 17.9 | 5.3 | 18   | 4 | 28 | 0.03 |
| Physical Education        | 182 | 18.7 | 5.2 | 19   | 4 | 28 |      |
| Nursing                   | 246 | 19.0 | 5.7 | 19   | 4 | 28 |      |
| Pharmacy                  | 140 | 19.8 | 5.0 | 19.5 | 4 | 28 |      |
| External control          |     |      |     |      |   |    |      |
| Family income             |     |      |     |      |   |    |      |
| 1 to 3 minimum wages      | 372 | 11.4 | 4.3 | 12   | 3 | 21 | 0.04 |
| 4 to 6 minimum wages      | 257 | 10.7 | 3.8 | 11   | 3 | 21 |      |
| 7 or more minimum wages   | 84  | 10.5 | 4.1 | 11   | 3 | 21 |      |
| Semester*                 |     |      |     |      |   |    |      |
| 2nd to 4th                | 398 | 11.4 | 4.1 | 12   | 3 | 21 | 0.02 |
| 5th to 6th                | 315 | 10.7 | 4.1 | 11   | 3 | 21 |      |
| Internal control          |     |      |     |      |   |    |      |
| Family income             |     |      |     |      |   |    |      |
| 1 to 3 minimum wages      | 372 | 15.4 | 5.6 | 16   | 4 | 28 | 0.02 |
| 4 to 6 minimum wages      | 257 | 14.6 | 4.7 | 15   | 4 | 28 |      |
| 7 or more minimum wages   | 84  | 14.0 | 6.0 | 15   | 4 | 28 |      |
| Semester*                 |     |      |     |      |   |    |      |
| 2nd to 4th                | 398 | 15.3 | 5.4 | 16   | 4 | 28 | 0.04 |
| 5th to 6th                | 315 | 14.5 | 5.3 | 15   | 4 | 28 |      |
| Control by Identification |     |      |     |      |   |    |      |
| Semester*                 |     |      |     |      |   |    |      |
| 2nd to 4th                | 398 | 16.2 | 5.8 | 16   | 4 | 28 | 0.01 |
| 5th to 6th                | 315 | 15.1 | 5.7 | 15   | 4 | 28 |      |
| Intrinsic Motivation      |     |      |     |      |   |    |      |
| Semester*                 |     |      |     |      |   |    |      |
| 2nd to 4th                | 398 | 18.3 | 6.6 | 19   | 5 | 35 | 0.02 |
| 5th to 6th                | 315 | 17.2 | 6.7 | 17   | 5 | 35 |      |

Note: Kruskal-Wallis Test / \*Mann Whitney Test

In the External Control and Internal Control factors there was a significant difference for the family income variable. These data show that students with family income between 1 and 3 minimum wages presented higher means in both external and internal control (Table 4).

The semester variable presented a significant difference in the comparison regarding the External Control, Internal Control, Control by Identification and Intrinsic Motivation factors. Students in the 2nd to 4th semester had higher mean scores in these factors compared to those in the 5th to 8th semester (Table 4).

Figure 1 highlights the positive influence of income on the external and internal control



of the individual in relation to the use of digital technologies, in which the participants with the lowest income (1 to 3 minimum wages) were the ones who managed to direct behaviors more visualizing external rewards and satisfaction through the realization of the disciplines that used digital resources as a form of communication and learning.

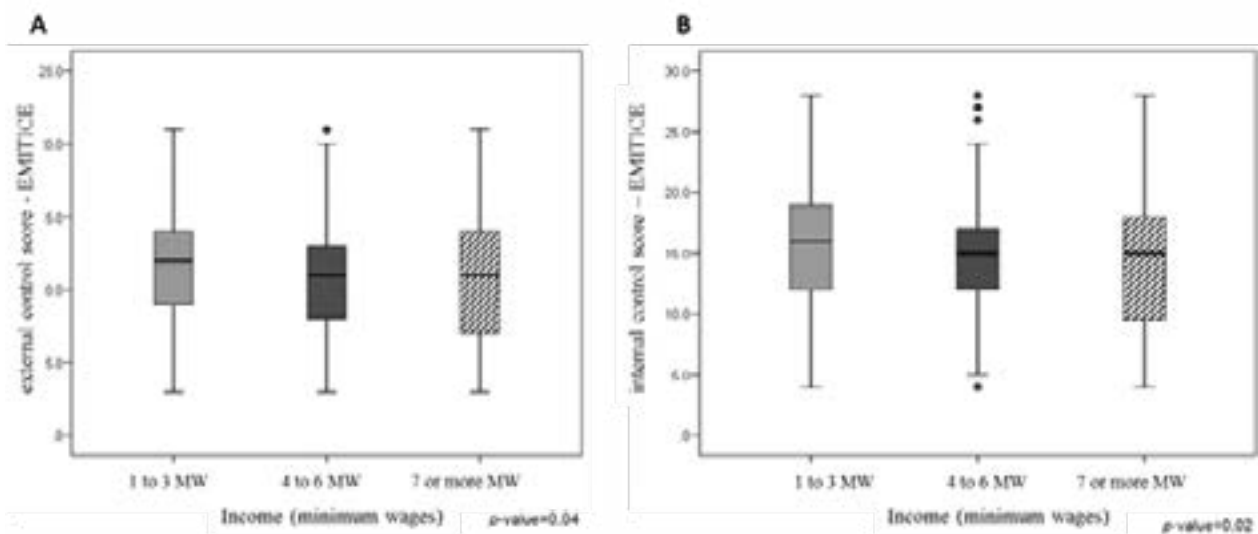


Figure 1 - Significant associations of the income in minimum wages variable with the EMITICE (n = 713). Guarulhos, SP, Brazil, 2016

Legend: MW: minimum wages. p-value: level of significance. Result of the two-by-two comparison through Dunn's post hoc test: A: The difference was between students receiving between 1 and 3 MW versus 4 and 6 MW. B: The difference was between students receiving between 1 and 3 MW versus 7 or more MW. A and B: Kruskal-Wallis test.

## DISCUSSION

In this study, the participants presented a high mean age for university students, indicating a late investment in higher education. According to the 2009 Higher Education Census of the Ministry of Education, the mean age of university students was 21 years. They usually enter the university through the entrance examination at the age of 19 in undergraduate courses in private institutions, with the most frequent completion age being 23 years<sup>(16)</sup>.

When considering the mean age found in this study, it can be seen that the majority of the participants were part of a young generation characterized by digital fluency, which justifies this variable not having significantly impacted on any of the EMITICE factors.

Another important point to note is the mean family income of 3.9 minimum wages of the students in this study, a value that converges with the economic context of the region. The HEI studied is located in a municipality of the metropolitan region of São Paulo, with lower economic conditions, since the *per capita* household income in the city of São Paulo corresponded to 1.8 times that of the municipality studied (R\$1,516.21 versus R\$829,91) according to a census by the Brazilian Institute of Geography and Statistics (IBGE)<sup>(17)</sup>.

Family income influences certain learning patterns. A study conducted in the United Kingdom<sup>(18)</sup> found that students with high family income were likely to exhibit a pattern of learning directed toward meaning (meaningful learning), while those with low income were more likely to exhibit a pattern of learning driven by reproduction (mechanical learning).

Meaning and reproduction approaches produce very different results in learning<sup>(19)</sup>.

Although previous studies highlight low income as an unfavorable factor for the learning process<sup>(17-19)</sup>, in this study, the individuals from a family with lower income (from 1 to 3 minimum wages) had greater external and internal control in relation to the use of DICTs. These participants showed greater willingness to conduct externally and internally regulated behaviors to seek rewards and improve self-esteem.

Low income can have a positive impact on the motivation in the use of DICTs, since individuals in this socioeconomic situation tend to commence higher education more determined and later and to invest in education as an opportunity to change their current life situation. However, demotivation was predominant in the general context and was the factor that obtained the highest mean in comparison to the others.

The students of the 2<sup>nd</sup> to 4<sup>th</sup> semesters stood out regarding motivation, since they presented higher means in relation to the External Control, Internal Control, Control by Identification and Intrinsic Motivation factors. This data shows that they can regulate behaviors by external and internal means, act effectively when a choice is unavailable, and motivate themselves by generating intentional behavior based on their own needs and wants.

A quantitative study carried out with students from the School of Education, Technology and Management obtained convergent results in relation to the semester and motivation in the use of TDICs. Second-year students (3<sup>rd</sup> and 4<sup>th</sup> semesters) attributed greater importance to the items individual study and the use of digital educational resources, such as online encyclopedias, scientific repositories and e-learning platforms<sup>(20)</sup>.

In this study, there are aspects that may have directly influenced the high demotivation of the participants, such as the structure of the disciplines (always in the same form of presentation, with little innovation and interaction) and the pedagogical strategy (content presentation only in a textual format).

The use of creative and innovative teaching strategies enables systematized searches on the internet itself and increases students' interest in courses that are 100% online or hybrid. Problem-Based Learning<sup>(21)</sup> enriched by DICTs and the use of WebQuests<sup>(22)</sup> exemplify ways to broaden learning to learn and contemplate higher levels of operations of thinking to solve problems during the health graduation course.

The need for a more direct relationship with the tutor or teacher can strengthen the autonomy and the discipline to carry out the studies in the virtual environment, as the lack of knowledge for textual interpretation, the accumulation of tasks and missing deadlines can compromise the learning process<sup>(8)</sup>.

As a consequence of these difficulties in learning, the distance disciplines are performed more due to obligation than for pleasure, converging with one of the results found in the present study. Based on the descriptive analysis of the EMITICE items, the students had the feeling of wasting time and did not understand the relevance of learning with the technology or the reason for DICT requests in the academic work and in the classes.

The teacher-student relationship is an important element in the teaching-learning process in the classroom, in which the teacher must provide opportunities so that the lesson is in fact a moment of exchange, development of potentialities, intellectual growth and discovery of values that will contribute to the students' personal development as citizens and as future professionals<sup>(23)</sup>.

Pedagogical mediation in virtual environments helps to reaffirm the importance of the student, object of knowledge and teacher relationship. However, the process of mediating supported in the DICTs presents some complexity, needing to be learned and requiring appropriation of these telematic tools by the teacher, in order to incorporate them into the

learning process<sup>(24)</sup>.

The limitations of the present study include the non-randomization of the participants, the exclusivity of one HEI evaluated and the type of teaching modality focusing on contents and multiple-choice questions as mandatory activities for the students. However, the importance of this study is in recognizing the socioeconomic characteristics of the students of the HEI as elements that contribute to the planning, implementation and evaluation of the DE courses and disciplines.

## CONCLUSION

The motivation of the students in the performance of 100% distance education disciplines in the HEI studied was low to moderate. The impression of wasting time, the obligation to complete the online tasks and the lack of understanding about the relevance of learning and using DICTs in the work and classes were evidenced.

Demotivation was influenced by the marital status and the course. Age did not affect the motivation of the students in the use of DICTs. Family income positively impacted on the external control and internal control of the participants with lower incomes.

The semesters of the courses impacted on external control, internal control, control by identification and intrinsic motivation. The students of the 2nd to 4th semesters presented higher means in relation to the External Control, Internal Control, Control by Identification and Intrinsic Motivation factors. Having a stable partner and being enrolled in the Pharmacy course were relate to demotivation in the use of DICTs.

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