NURSING UNDERGRADUATE STUDENTS' MOTIVATION IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

MOTIVAÇÃO DE ALUNOS DE ENFERMAGEM NO USO DAS TECNOLOGIAS DA INFORMAÇÃO E COMUNICAÇÃO

MOTIVACIÓN DE LOS ALUMNOS DE ENFERMERÍA EN EL USO DE LAS TECNOLOGÍAS DE LA INFORMACIÓN Y COMUNICACIÓN

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Objectives: To measure nursing undergraduate students' motivation in the use of information and communication technologies in distance education and to evaluate the interference of personal characteristics in motivation for the use of these technologies. Method: A quantitative cross-sectional study was carried out with the use of the scale of evaluation of motivation factors regarding the integration of information and communication technologies for education (EMITICE- *Echelle de motivation lor de l'intégration des technologies de l'information et des communications dans l'enseignement*). Descriptive and inferential analyses were carried out. Results: The sample of 188 undergraduate nursing students presented low mean motivation, with a mean score of 77.49 (±25.57). The lack of motivation in the use of information and communication technologies was evident and more significant among women. Conclusion: In general, higher motivation was found in widowed or separated students, and in those enrolled in the fifth or eighth semesters.

Descriptors: Distance Education. Higher Education. Educational Technology. Nursing.

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Objetivos: mensurar a motivação no uso de Tecnologia da Informação e Comunicação na Educação a Distância de alunos do curso de enfermagem e avaliar a interferência de características pessoais na motivação para o uso dessas tecnologias. Método: estudo transversal quantitativo com o uso da Escala de Avaliação de Fatores de Motivação com Relação à Integração das Tecnologias de Informação e Comunicação ao Ensino. Foram realizadas análises descritiva e inferencial. Resultados: a amostra de 188 alunos de graduação em enfermagem apresentou baixa média de motivação, com escore médio de 77,49 (±25,57). A desmotivação no uso da Tecnologia da Informação e Comunicação foi evidente e mais acentuada no sexo feminino. Conclusão: em geral, maior motivação foi encontrada em alunos viúvos ou separados e naqueles matriculados no quinto ou oitavo semestres.

Descritores: Educação a distância. Educação superior. Tecnologia educacional. Enfermagem.

Objetivos: mensurar la motivación en el uso de la Tecnología de la Información y Comunicación en la Educación a la Distancia de los alumnos del curso de enfermería y evaluar la interferencia de las características personales en la motivación para el uso de esas tecnologías. Método: estudio con enfoque transversal cuantitativo con el uso de la Escala de Evaluación de Factores de Motivación con Relación a la Integración a la enseñanza de las Tecnologías de la Información y Comunicación. Se realizó un análisis descriptivo e inferencial. Resultados: la muestra de 188 alumnos de graduación en enfermería presentó una media de motivación baja, con un cálculo medio de 77,49 (±25,57). La desmotivación en el uso de la Tecnología de la Información y Comunicación fue evidente y más acentuada en el sexo femenino. Conclusión: en general, la mayor motivación fue encontrada en alumnos viudos o separados y, en aquellos matriculados en el quinto u octavo semestres.

Descriptores: Educación a la distancia. Educación superior. Tecnología educacional. Enfermería.

Introduction

The increasing use of information and communication technologies (ICT) and distance education (DE) has generated wide-ranging discussions on their interference in the training of healthcare professionals. Proposals of DE that applied ICTs in an innovative and creative way presented positive results for the teaching-learning process[1-3]. In the teaching of clinical content, there is no evidence that distance education compromises learning or produces results different from the classroom attendance modality[4]. However, the excessive use of distance learning in nursing courses, beyond the limit of 20% of the total class load approved by the Brazilian Ministry of Education, may compromise the training of professional competencies, especially in technical and relational dimensions. Distance from face-to-face contact with professionals and users of healthcare services, in both interaction and development of techniques and procedures, would compromise the training of qualified professionals to recognize people's fragilities and needs[5].

In spite of the relevance of this issue, other aspects that involve the learning process must be investigated. In online education, dynamic and active characters are learning determinants. This may be defined as a dynamic process in which knowledge and skills are continuously developed. It is worth mentioning interaction and motivation as the main support of the process to time self-management[6].

Motivation, which is the object of this study, presupposes an intention to act[7] and is of utmost importance in the educational process. It may produce an effect on learning and performance, as much as learning may interfere with motivation[8], because motivational factors may be determinants in the way people interact and place themselves in their relationships with others and with aspects of life itself. The current understanding of motivation involves intrinsic and extrinsic dimensions of individuals[7]. Learning depends on both dimensions of motivation, that is, depends on both students' involvement with the activity, due to interest or satisfaction, and interest for rewards and compliments[8].

The importance of motivation in learning and online learning, interpersonal communication based on interaction as an important factor

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in bonding, and the need to identify other aspects that interfere with motivation, justify the relevance of the present study.

With the purpose of clarifying the understanding of motivation of students who attend courses at distance and supporting pedagogical actions in this context, the objective of this study was to measure nursing students' motivation in the use of ICT in DE and to evaluate the interference of personal characteristics in the motivation for the use of these technologies.

Method

This was a quantitative cross-sectional study, which has as dependent variable motivation, and as independent variables gender, age, marital status, and course semester.

The study was carried out in a private Higher Education Institution (HEI) located in Guarulhos, a city in the state of São Paulo, Brazil, with nursing undergraduate students. Growth trends in the use of ICTs in education were followed, considered essential in the learning process[9]. The HEI that was setting of this study offers online courses as part of the professional training academic activities, within the limit of 20% established by the Brazilian education's legislation.

For the nursing course, the duration is 8 semesters, with a total of 4,440 hours. In the DE modality, 14 compulsory and 4 elective courses are offered, totaling the limit of 720 hours of online activities. The courses are attended by means of Modular Object-Oriented Dynamic Learning Environment® (Moodle®), and include healthcare content, current reflective content, environmental themes, development of integration projects of several courses, as much as methodological practice of research and production of texts. This format aims at offering students an overall and diverse training, based on a flexible curriculum.

Among the population of the study, which was made up of 474 undergraduate students, a sample size of 182 participants was estimated for application of the data collection instrument. The sample calculation was carried out by means of the website of the Laboratory of Epidemiology and Statistics of the Dante Pazzanese Institute of Cardiology, considering standard deviation (SD; σ=11.97) and mean (μ=82.23) values of a pilot study with 30 students from five healthcare courses at the institution (biomedicine, biological sciences, pharmacy, physiotherapy, and dentistry). The coefficient of variation (CV) was calculated based on the ratio between SD and mean (CV=SD/Mean; CV=045). The estimate's maximum error was calculated by multiplication of the CV and σ (0.145 x 11.97), resulting in 1.74. The significance level was pre-established at 5%. The total sample was made up of 188 nursing students.

The inclusion criteria were students aged 18 years or older, effectively enrolled in the undergraduate nursing course, and attending, at the time of data collection, at least one of the disciplines of DE offered by the institution setting of the study. No exclusion criteria were applied and the instrument was self-administered.

The participants were recruited between October and December 2014 by means of two strategies. In the first strategy, a link in the virtual environment of the Moodle® was made available, by means of which the students had access to the free and informed consent form, a questionnaire, and an instructional video of 33 seconds, in which the researcher presented herself, explained objectives, and invited them to participate in the study. In the second strategy, the students were approached by the researcher in the HEI, before or after classes, to respond to the printed questionnaire. Personal recruitment was necessary, due to the low adherence of students to the virtual environment.

The scale of evaluation of motivation factors regarding the integration of information and communication technologies for education (EMITICE) was used to measure motivation, validated according to the original Canadian scale entitled *Echelle de motivation lor de l'intégration des technologies de l'information et des communications dans l'enseignement*, which is based on the theory of motivation developed by Deci and Ryan. This instrument is made up

of 20 questions distributed into five factors: lack of motivation (lack of intention to act), external control (external influences as rewards), internal control (internalization of external source), control by identification (decision making in contingency situations), and intrinsic motivation (behavior motivated by will and personal values)[7].

The items of the scale are evaluated by means of a seven-point Likert scale, in which the lowest value must be attributed when the item does not correspond absolutely, and the highest value when the item corresponds absolutely. The total score ranges from 20 to 140 points, and consists of the sum of the responses to the 20 items. The higher the total score, the higher the motivation in the use of ICT in DE[7].

Descriptive and inferential analyses were carried out. Association of age with total scores and with each factor was measured by means of Spearman's rank correlation coefficient. The factors were studied with regard to gender, marital status, and course semester through the Mann-Whitney U test. The probability of error adopted in the tests was $p<0.05$. The Statistical Package for the Social Sciences 21 (SPSS) software was used for analysis.

The development of the present study met national and international ethical principles on research involving human beings and was approved by the research ethics committee of the HEI under protocol no. 512.813.

Results

A total of 188 nursing undergraduate students were interviewed. Among these, 44 responded through virtual environment and 144 responded face-to-face. The return of responses through the online instrument represented 9.28% of the population and 23.4% of the sample. The participants' mean age was 29.31 years (±8.26) and the sample was mostly made up of women (n=166; 88.30%) and single students (n=101; 53.72%). Most students were enrolled in the fourth (n=48; 25.53%) and second (n=42; 22.34%) semesters.

The total mean score of the participants' responses regarding the EMITICE was 77.49 (±25.57), presenting, in general, low to moderate motivation in the use of ICT, since the total score ranged from 20 to 140. The distribution of the participants in relation to the total score, showed that almost half of them obtained a score below (49.47%) and above (50.53%) the score 80 of the instrument (mean point), showing some balance regarding the theme studied. In the analysis of the means of each dimension in the EMITICE, the highest score in the dimension lack of motivation stood out (20.21 ±5.88), showing lack of willingness or intention to act regarding ICTs (Table 1).

Table 1 – Description of dimensions and total score of the EMITICE. Guarulhos, São Paulo, Brazil – 2014. (n=188)

Dimension	Items	Score variation	Mean	Standard deviation
Lack of motivation*	4	4-28	20.21	5.88
External control	3	3-21	10.10	4.57
Internal control	4	4-28	14.76	6.03
Control by identification	4	4-28	14.96	6.99
Intrinsic motivation	5	5-35	17.46	8.24
Total score	20	20-140	77.49	25.57

Source: Created by the authors.

*Items recoded for the total score.

With regard to the descriptive analysis of the participants' responses related to motivation in the use of ICTs, the items of the dimension lack of motivation presented the highest means-item 3 (5.11 ±1.85), item 13 (5.06 ±1.83), and item 18 (5.22 ±1.78), showing that students felt they were

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wasting their time using ICTs, and that they did not understand why they were using them in the course.

The items with the lowest means were item 1 (3.35 ±1.77) and item 5 (3.23 ±1.85) of the dimension intrinsic motivation, and item 6 (2.85 ±1.70) of the dimension external control,

showing little pleasure and interest in the use of ICTs. However, they were used because there was no other way to carry out the university's courses.

There was no significant correlation among age, total score, and dimensions of the scale (Table 2).

Table 2 – Correlation of the dimensions of the EMITICE with the numerical variable age. Guarulhos, São Paulo, Brazil – 2014. (n=188)

Dimensions	Age	
	R	**P value**
Lack of motivation	0.018	0.802
External control	0.122	0.094
Internal control	0.075	0.303
Control by identification	0.090	0.218
Intrinsic motivation	0.132	0.070

Source: Created by the authors.

Spearman's rank correlation coefficient.

A statistically significant difference was found in the dimension lack of motivation regarding age and marital status. Women, divorced, and widowed participants were those who most showed lack of motivation, feeling they were wasting their time, not understanding the relevance of using ICTs, and why they were using them (Table 3).

In the dimension external control, statistically significant differences were found in the variables

marital status and course semester, in which widowed and separated students, as well as students attending the fifth or eighth semesters, recognized that DE could make professional activity more interesting and be a differential to get a more stable job. They also recognized that there is no other way to conclude the course successfully (Table 3).

Table 3 – Association of the dimensions lack of motivation and external control of the EMITICE with categorical variables. Guarulhos, São Paulo, Brazil – 2014. (n=188) (to be continued)

Characteristics	Lack of motivation			External control		
	Mean	**Standard deviation**	**P value**	**Mean**	**Standard deviation**	**P value**
Gender			0.047			0.920
Female	20.51	5.8		10.06	4.5	
Male	17.95	6.1		10.41	4.8	
Marital status			0.026			0.031
Single	20.29	5.6		9.90	4.8	
Married	19.34	6.2		9.99	4.4	
Widowed	25.00	6.0		14.75	1.0	
Separated	19.80	6.4		12.60	2.6	
Divorced	26.17	2.7		7.50	4.0	
Semester			0.928			0.003
First	18.00	-		10.00	-	
Second	20.69	5.7		9.71	4.9	
Third	18.33	3.0		10.33	2.9	

Table 3 – Association of the dimensions lack of motivation and external control of the EMITICE with categorical variables. Guarulhos, São Paulo, Brazil – 2014. (n=188)

(conclusion)

Characteristics	Lack of motivation			External control		
	Mean	Standard deviation	P value	Mean	Standard deviation	P value
Fourth	20.04	5.4		9.04	4.1	
Fifth	21.00	6.2		12.66	4.1	
Sixth	20.03	6.4		8.34	4.3	
Seventh	19.25	6.3		9.17	5.0	
Eighth	19.60	7.1		12.67	4.1	

Source: Created by the authors.

Mann-Whitney U test was used for independent samples.

A statistically significant difference was found in the dimension internal control regarding the variable course semester, in which the participants of the fifth or eighth semesters presented higher means compared to the items that evaluated the need to prove that they were capable, intelligent, important, and competent, as well as recognizing that ICTs should be used (Table 4).

In the dimensions control by identification and intrinsic motivation, statistically significant differences were found in the variables marital status and semester, showing that widowed and separated students, as well as students of the fifth or eighth semesters, had both more control by identification and intrinsic motivation. In the dimension control by identification, the participants recognized that the use of ICTs prepared better for profession and career, were essential tools for training, and increased professional competence. Intrinsic motivation was expressed by responses regarding pleasure in undertaking and developing projects, pleasure in using ICTs, challenging learning, and interest for ICTs (Table 4).

In general, the highest means found in the subscore of widowed and separated students with a mean age of 46 and 39 years, compared to single and married students with a mean age of 25 and 33 years, in addition to statistically significant differences in four of the five dimensions of the scale, showed that probably, perceptions of two generations were compared, with significant differences regarding the use of ICTs (Table 4).

Higher means found in the subscores of students of the fifth or eighth semesters in statistically significant differences, also in four of the five dimensions of the scale, were possibly related to the fact that the use of ICTs in the university in this period of the course was no longer a novelty, and most students were already adapted to them in disciplines of DE (Table 4).

Table 4 – Association of the dimensions internal control, control by identification, and intrinsic motivation of the EMITICE with categorical variables. Guarulhos, São Paulo, Brazil – 2014. (n=188)

(to be continued)

Characteristics	Internal control			Control by identification			Intrinsic motivation		
	Mean	Standard deviation	P value	Mean	Standard deviation	P value	Mean	Standard deviation	P value
Gender			0.724			0.990			0.619
Female	14.68	6.0		14.96	7.0		17.34	8.2	
Male	15.36	6.2		15.00	7.1		18.32	8.6	
Marital status			0.149			0.036			0.023
Single	14.51	6.4		14.76	7.3		16.86	8.4	
Married	14.78	5.7		14.45	6.6		16.96	7.9	
Widowed	19.00	4.1		24.75	4.5		27.50	4.0	

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(conclusion)

Characteristics	Internal control			Control by identification			Intrinsic motivation		
	Mean	Standard deviation	P value	Mean	Standard deviation	P value	Mean	Standard deviation	P value
Separated	17.30	4.7		17.90	2.8		22.60	5.8	
Divorced	11.67	3.6		12.67	8.6		17.83	9.1	
Semester			0.049			0.002			0.000
First	13.00	-		14.00	-		16.00	-	
Second	14.36	6.7		14.00	7.3		15.55	8.3	
Third	16.50	4.2		16.17	3.8		19.00	4.9	
Fourth	13.92	5.9		13.73	6.4		15.75	7.5	
Fifth	17.03	6.0		18.91	6.8		22.77	7.9	
Sixth	12.62	5.3		12.66	6,6		15.10	7.4	
Seventh	13.58	6.9		12.08	7.1		13.83	8.4	
Eighth	17.80	4.0		18.73	5.8		22.80	6.9	

Source: Created by the authors.

Mann-Whitney U test was used for independent samples.

Discussion

In the nursing context, the use of technologies advanced in the healthcare and education area, demanding that professors and students prepare themselves for the use of these tools. It is worth mentioning that technology must be used as a tool to improve education and requires critical view on the context where it is used. Possible advances regarding institutional, health, and education policies must be evaluated and directed to the recognition of benefits and challenges that the theme requires[10].

The increasing use of ICTs in different contexts and types of education has been inevitable and necessary. A study that analyzed the situation of nursing education in Latin America and the Caribbean evidenced the need for strengthening the use of ICTs in professional training, since this technology is positive for both the teaching-learning process, inside and outside classroom, and for future professional practice. The authors highlight that all transformations in the paradigm of current education in health sciences must be directed to meet the demands of the population[9].

The relationship among new ICTs, teaching, and learning has an important role in the DE context, allowing the development of interactive virtual learning environments that enable communication and improve accessibility. However, it is of utmost importance that everyone involved, that is professors and students, is aware of the characteristics of the modality in question, in order to deal better with expectations regarding access, training, interaction, means of communication, and system of evaluation[11].

The main barriers for the use of ICTs in nursing education are in the lack of investment in educational policies for university training in nursing and the lack of knowledge of professors and students for the use of technologies in education[3]. In this respect, the adaptation of education institutions is essential, since ICTs provide a space of renewal of the teaching-learning process and bring new challenges, when transforming the school model of transmission of information into a model of active construction of knowledge and collaboration[6]. It is worth mentioning that the planning of activities cannot be limited to the offer of classroom attendance content transposed to the new modality. Distance education must make use of strategies of interaction, collaboration, reflection, and collective construction of knowledge, and several available technological resources[12].

Like in the international context[4,13], in Brazil, the use of DE strategies in nursing has been a topic investigated and discussed regarding its benefits or damage for education. Different experiences have shown the benefits of ICT and DE within the limits approved by the Brazilian Ministry of Education[1-3,5,10,12]; however, it is worth reflecting on the tangibility of care and the need for interaction of students with other professionals and patients[4], especially in the choice of courses or content that could be dealt at distance. It is worth mentioning that the present study focuses on the use of DE according to the class load limit provided by legal bases and the recognition of the strategy's potential by the Federal Nursing Council[5]. This study does not intend to discuss the feasibility of courses totally based on DE, which is a practice not approved by the Brazilian Ministry of Health and rejected by the Council[5].

In the setting of the present study, the distance learning module of some disciplines of the nursing course is established as part of academic activities, making it even more relevant to investigate the motivation in study mediated by ICTs through DE. Motivation determines interpersonal interaction and, especially, individual's autonomy. According to the Self-Determination Theory, which was basis for the development of the scale applied in this study, motivation is distinguished between extrinsic and intrinsic[7].

In extrinsic motivation, individuals are driven by external conditions, benefits, or punishment, since the action itself does not meet their demands[14]. Therefore, low to median motivation levels presented in the results may be associated with the obligation to attend online disciplines in order to conclude the nursing course. Although the use of ICTs is a current trend, complementary studies may clarify the expectation of students regarding content developed in classroom attendance and distance education modalities.

As regards intrinsic motivation, individuals are driven for action by internal reasons based on intrinsic demands, that is, personal demands. Individuals' gratification results from their own

actions, without the need for external benefits as drivers[14]. The results measured in this study presented, significantly, low to moderate motivation levels among the participants in the study.

It is worth mentioning that all individuals have an innate capacity of motivation, although social interactions are required to strengthen its determinants: feelings of competence, autonomy, and belonging. In the educational context, these aspects are expressed by willingness and initiative to study[15]. In the present study, widowed and separated students, even with lack of motivation, seemed to face the need for the use of ICTs with more maturity and they recognized the importance of these technologies for future professional competence.

In addition, the Self-Determination Theory presupposes three central basic needs that, when satisfied, make it possible to "internalize" motivation. First, the need to feel competent, be useful, recognize their values, by means of competence. Additionally, the need for autonomy, which refers to freedom to undertake the activity in their "way", taking their values in consideration. Finally, bonding represented by the need for establishing consistent relationships with one or more individuals who care beyond the activity[8,16].

The students' profile may be a determinant factor for motivation and development of learning strategies. Adult individuals, such as the majority of the participants in this study, professionally active and self-motivated, may present better performance in the DE modality, especially due to their maturity to deal with the new, constant challenges, and self-control[17]. Regarding gender, there was a prevalence of women in the use of ICTs to support learning, corroborating results of a Portuguese study[18].

Also, experiences acquired by adults conform a pool of resources that favor the learning process. This, in turn, is associated with the solution of practical questions, requiring pedagogical approach different from those used for children[19]. Adults seek DE as a way of meeting a need for training and updating, in

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a model that meets their daily demands of time and traveling[20].

Studies show advantages resulting from the use of ICTs and better performance of students in the teaching-learning process, in both fully DE modalities and in the use of ICTs as support. It is evident that the use of ICTs since the basic education of individuals, as a continuous and gradual process, improves motivation and creativity, as well as meets the demands of new generations[18,21].

In the dimension lack of motivation, the participants considered the use of ICTs a waste of time. For the participants, especially among women, widowed, and divorced students, it was not clear why this technology was being used. Lack of motivation has a negative effect in initiative and compromises the commitment of students. Consequently, it compromises learning and performance[15].

The several existing technological resources in the platforms of DE favor the virtual rapprochement between students and tutors. Their main role is to facilitate and motivate students during the teaching-learning process[20]. The experience of training ICT tutors and the use of active methods at distance seem to influence the motivation of students and their performance in DE courses. Professors of several areas of knowledge of a university identified fragilities in the development of professors, work overload, and insecurity, discouraging their participation in ICT training. The learning of active methods and teamwork were highlighted as potentialities[22].

However, the more informational is the DE model, the lesser the need for interaction, which may severely compromise students' motivation and learning. In order to supply these characteristics, the instructional design must be based on high-quality materials, to transpose classroom attendance content into virtual environment content[19]. Therefore, structure and content must overcome the expectation of students regarding interactivity and the dynamic character of the course, which are characteristics not always endorsed by DE courses.

Women may opt for DE courses due to the low demand of time to study. However, they present more personal difficulties, health problems, and family commitments as barriers in the development of educational activities[23]. This may justify the relationship between lack of motivation and women observed in the present study.

With regard to external control, the participants did not show interest in the use of ICTs. The participants who attended the fifth and eighth semesters, as well as separated and widowed participants, considered that there was no other way to attend the course, and thus, the use of ICTs could be a differential. Regarding the dimension control by identification, the participants who attended the fifth and eighth semesters, as well as widowed and separated participants, recognized that ICTs could prepare them for a better performance and increase professional competence, in addition to being an essential tool.

Some school and academic activities are not interesting for students, from the perspective of mobilization of interpersonal processes. In order to overcome this characteristic and maintain acceptable levels of motivation, extrinsic motivation must be internalized[15]. External regulations were internalized, thus integrating their personal values[7]. The reasons and rewards involved in the development of DE courses must be internalized, in order to justify the continuing willingness to study. It is possible that students of the fifth and eighth semesters, close to the conclusion of their nursing major and future professional practice, internalized extrinsic motivation and were able to perceive the importance of the use of ICTs for their training, which is evidenced in the dimension control by identification.

When analyzing the item intrinsic motivation, it was observed that ICTs do not prove that the students interviewed are able to learn with them, in addition to having little pleasure in their use. However, the advantages or disadvantages in the use of ICTs is a theme hardly approached in the literature. It cannot be stated whether

there is a significant difference among levels of satisfaction of students in classroom attendance modality when compared with DE. However, it is important that intrinsic motivation overcomes extrinsic motivation and its relation to the context.

In poor contexts, from the point of view of training of professors and structural support for the use of ICTs by students, experiences may be negative and discouraging. In a qualitative study carried out with a sample of 42 students attending the fourth period of an undergraduate nursing course, the main objective was to analyze the perception of students concerning their assimilation in online disciplines. The results evidenced that, in the students' perception, there was a need for reformulating the DE process, adequacy of language, more training in virtual platforms, and more interactivity. That is, 50% of the students disagreed that these strategies serve as mediators in the learning process[24]. In the present study, it was also identified that training and adaptation may be positive factors for motivation of DE students, since students of the fifth and eighth semesters seemed to be more motivated than those attending previous school semesters.

A challenge in the present study was the low frequency of response of the participants to the online instrument made available in the Moodle® platform, requiring the presence of the researcher for conclusion of empirical data collection. However, the participation was similar to another study that had about 10% of return in invitations for data collection through the web. Although it was a limitation, the response rate, in the case of this study, could be complemented by the face-to-face data collection strategy, reaching the stipulated sample[25].

In addition, the results of the present study are limited to the application of the measurement scale of motivation levels. Further studies with different approaches are necessary to recognize meanings, perceptions, and implications of motivation for students, as a way of identifying and directing the necessary changes in the setting of the study, in order to improve DE

strategy, optimize the use of ICTs, and improve educational results, beyond motivation itself.

Conclusions

For the participants in this study, the use of ICTs presented low to moderate motivation levels, represented by the feeling of waste of time, lack of understanding of the relevance and importance of these technologies for future professional competence. Lack of motivation was evident and more significant among women, showing lack of willingness or intention to act regarding ICTs by students.

However, in general, a higher motivation was found in widowed and separated students in comparison with single and married students, showing that, even presenting difficulties in the use of ICTs, the individuals recognized the importance of these technologies for future professional competence. Therefore, it was evident that factors such as maturity and adaptation to the use of ICTs may be essential for a higher motivation in this education modality. Enjoying the use of ICTs or having pleasure in their use depend on the development of autonomy, self-control, ability for organization of time, and personal motivation, which are elements necessary to establish learning in this education modality.

The use of ICTs and DE is emerging and possible educational trends in the Brazilian context. In addition, they are able to break barriers of time and space, reduce costs, and optimize efforts, since they are adopted in different levels of professional training and qualification. The digital literacy of new generations is a facilitator of this renewal process of pedagogical strategies, although for students trained by traditional educational models, autonomous study may be configured as a barrier or challenge.

The role of HEIs is to develop and improve their educational and technological resources, following both trends and informational and pedagogical advances, and current demands regarding the need for profiles of students, professionals, and careers. Moreover, observation

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of educational guidelines and recommendations from different areas of education, as well as professional classroom councils, must be included in the planning setting in the use of ICT and especially DE, in order to strengthen consistent education, able to provide comprehensive care to meet the needs of the population who uses healthcare services.

Collaborations

1. conception, project, analysis, and interpretation of the data: Luciene Marcelina Alves de Oliveira, Ellen Moreira de Souza, Evellyn Franco Pontes, Luciane Lucio Pereira and Ana Claudia Puggina;

2. writing of the article, relevant critical review of its intellectual content: Maíra Rosa Apostolico and Ana Claudia Puggina;

3. final approval of the version to be published: Ana Claudia Puggina.

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