Measuring Levels of Cooperation and Assertiveness in the E-Learning System During a Pandemic Crisis

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ABSTRACT

Agenda 2030 focuses on the sustainability of education. Objective: In the impossibility of teaching in person due to the public health measures implemented to stop the COVID-19 pandemic, an attempt was made to evaluate in the e-learning system: the cooperation and assertiveness levels in students and the correlation between these variables. Method: This is a quantitative, cross-sectional study involving 329 higher Portuguese education students, using beyond a demographic questionnaire and two scales: EAGC and EAGA. Results:The sample mean of EAGC=31.57 ($\pm$ 6.59 sd) reveals an average capacity for cooperation and in the EAGA=30 ($\pm$ 5.9 sd) also reveals an average assertive competence who attend higher education. It was verified that there is a weak positive correlation (r_s=0.125) with strong statistical significance (p-value<0.01) between both scales.Students excel in assertiveness. Conclusion: The present scales may prove to be a contribution to sustainability in education, particularly in periods of confinement and emergency.

Introduction

There are multiple conceptions around the Qualityof Life construct and dimensions such as: health, safety, education, free time. Specifically according to the World Health Organization Quality of Life (WHOQOL) group, the quality of life encompasses the subject's perception and position in life in the context of the culture and value systems in which he/she lives and in relation to his/her objectives, expectations, standards andconcerns(WHOQOL,1995). It encompasses six domains: physical health, psychological health, level of independence, social relations, environment and beliefs/spirituality/religion in a multidisciplinarycomplexity (Titrek, Erkiliç,Süre, Güvenç, Pek, 2016;Santos, Galinha, Cunha,2020). In addition to these WHOQOL-100 and WHOQOL-BREF instruments, the Human Development Index applied by the UNHDP (United Nations Development Programme) integrates the following criteria: long and healthy life: life expectancy at birth; access to knowledge:

average years of study and expected years of schooling; and a decent standard of living: *per capitae*(UNHDP, 2003; Haggerty, Cummins, Ferriss, Land, Michalos, Peterson, Sharpe, Sirgy, Vogel, 2001). The United Nations Agenda for 2030 and its 17 objectives for sustainable development include education, 4th objective, to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Agenda 2030 brings a plan of action focused on people, the planet, prosperity, peace and partnerships (5P), with the ultimate goal of poverty eradication and sustainable development, in which all states and other stakeholders assume their own responsibilities for its implementation, which is an agenda with a universal dimension to be implemented by all countries, and not only in developing countries, as in the case of the Millennium Development Goals, in the period between 2000 and 2015. If already before Morin (2011), Nóvoa (2019) and Nóvoa and Alvim (2020) considered that the next generation will go through a complex metamorphosis of the school,

through a change of its form with the pandemic crisis even more metamorphoses are placed in the new era that we face.

In this progress, the COVID-19 pandemic is expected to have a profound effect on education in the post-pandemic era and as educators, to engage in security efforts such as: meetings limited to ten students, non-presential academics and the limitation of rotations between different locations, even within the institution, in order to minimize risk (ABC News, 2020;Chick, Clifton, Peace, Propper,Hale, Alseidi, Vreeland,2020). Faced with this problem, industry 4.0 refers to the fourth industrial revolution with the potential to meet custom requirements during the COVID-19 crisis through the manufacture and application of digital information technologies(Javaida, Haleem,Vaishya, Bahl, Suman, Vaish,2020). UNESCO (2020) estimates that the closure of educational institutions due to the COVID-19 pandemic affects half of the world's student population (890 million students in 114 countries). On the other hand, distance learning is an obstacle to the spread of the pandemic, but it brings increased (e.g. pedagogical) and perhaps discriminatory challenges in the socio-economic field since not all students have access to a computer with an internet connection (Araújo, Lima, Cidade, Nobre,Neto,2020). Also the new role of the teacher with emerging didactic situations around a virtual environment provides a new teaching situation mediated by technological devices.

This new way of teaching, with informatics didactic resources, requires a unique preparation of the teaching activity that creates moments of active and meaningful learning (Camacho, Joaquim, Menezes, Sant'Anna,2020). In these new times, according to Chentsova-Dutton (2020) we point out an integrative mode of the role of emotions in cultural dynamics, covering mechanisms ranging from micro (psychological mechanisms of cultural innovation, selection and transmission in individuals and small groups) to macro (emergence, maintenance and change of cultural systems).

In view of the above, the proposed theme is relevant at several levels. In short:

i) In Education, the advantages of cooperative work and assertiveness competence are multiple (Comoglio, Cardoso, 1996; Jardim, 2010; Jardim, 2019;Kaendler, Wiedmann, Rummel,Spada,2015) also to Agenda 2030 for Sustainable Development (United Nations Organization, 2015).

ii) Personal and social competences are increasingly important in marked development processes and or in transition in different educational contexts, as is the case of attending higher education, where a diversity of development tasks and life events confront the subject with the need for adaptation, requesting personal and environmental resources (Pereira, Motta, Vaz, Pinto, Bernardino, Melo, 2006;Dixe, Custódio, Catarino, Ventura, Loreto, Carrasqueira, Caetano, Nóbrega, 2010;OPP, 2020).

The present investigation aims during the COVID-19 period, in the e-learning system, to evaluate the cooperation and assertiveness in Portuguese higher education students using two specific scalesand with the use of sociodemographic information obtained by questionnaire. The authors believe that these proposed scales can be used as a complementary tool in distance learning so that teachers can outline teamwork strategies while maintaining the levels of cooperation and assertiveness in their students with a view to their higher education institutions.

Literature Review

Conceptual framework for sustainability, competences and e-learning in the pandemic crisis

Within the COVID-19 pandemic, as a public health problem affecting all citizens, psychic health occupies a prominent place, because of the expected impact of the pandemic and the isolation situation, and because it is a protective factor to face the challenges of the post-pandemic period (OPP, 2020; Wang, Pan, Wan, Tan, Xu, Ho, Ho, 2020). The epidemiological crisis and the moment of confinement by COVID-19, because of the impact of social isolation it entails, causes psychological suffering such as: anxiety, worry, anguish, uncertainty, loneliness, boredom, sadness and lack of hope (OPP, 2020; Rossi, Socci, Talevi,

Mensi, Niolu, Pacitti, Di Marco, Rossi, Siracusano, Di Lorenzo, 2020). Cultural differences are also a risk factor for mental health in this already vulnerable population (Júnior, Moreira, Pinheiro, Amorim, Lima, Silva, Neto, 2020). These lasting impacts, which may include an increase in mental health disorders, also involve a joint increase in adaptive reactions in order to recover well-being and avoid or mitigate the impact on academic productivity (OPP, 2020). This pandemic is a major international concern and poses a challenge to psychological resilience. The literature refers to the need for empirical research data to reduce adverse psychological impacts and psychiatric symptoms (Wang, Pan, Wan, Tan, Xu, Ho, Ho, 2020; Rossi, Socci, Talevi, Mensi, Niolu, Pacitti, Di Marco, Rossi, Siracusano, Di Lorenzo, 2020). Because it is a recent disease, many of its epidemiological aspects are not yet fully known. However, containment and social containment is a non-pharmacological measure used by all countries that minimizes contact with other individuals and extended groups until 2022 (Júnior, Moreira, Pinheiro, Amorim, Lima, Silva, Neto, 2020; Kissler, Tedijanto, Goldstein, Grad, Lipsitch, 2020). It includes social distancing, quarantine, isolation and restriction of movement/social interaction of people who may be infected with COVID-19, even if asymptomatic, by reserving themselves at home. In this line, the teaching-learning process brings new ways in the face of the new working reality of students in e-learning, in a more flexible and demanding reconstruction of the educational identity. In this sense, personal and social adaptive skills are essential, showing themselves to be useful in the organization of a new work routine whose teaching and learning spaces integrate their participants in different times and spaces through digital technologies of interaction and communication (Carmo, Franco, 2019; FVG, 2020). In turn, prolonged distance, even if intermittent, will have economic, social and educational consequences (Kissler, Tedijanto, Goldstein, Grad, Lipsitch, 2020). According to Peterson (1989) psychological well-being refers to the way people subjectively evaluate their lives both cognitively and affectively. Also according to Abdullah (2017) psychological health is the positive emotional, behavioral and mental state in a personal and social adjustment, in which this

period will require additional psychological resources, considered important attributes for good mental health. Personal and social skills take on increasing importance in the psychological development of the human subject and especially in processes of marked development and/or transition in different educational contexts, as is the case of this period of pandemic confinement, where a diversity of development tasks confront the subject with the need for adaptation, requesting personal resources (Pereira, Motta, Vaz, Pinto, Bernardino, Melo,2006;Dixe, Custódio, Catarino, Ventura, Loreto, Carrasqueira, Caetano, Nóbrega, 2010).Carmo and Franco (2019) presented a synthesis of skills and knowledge for online tutoring: didactic-pedagogical (mastery of the curricular unit and possibility of its teaching to young adult students through the mobilization of contents and didactic materials in order to promote learning); technological (ability to apply new technologies for dialogue and interaction and anticipation of possible difficulties); linguistic (in the writing and understanding of texts in order to preserve interpersonal relations in the group and guide the student in the process of building learning); social (in establishing and maintaining a teaching and learning environment conducive to communication and interaction between its participants); learning (about how to learn and teach, what are the different learning styles and their possibilities in the online environment); intercultural (ability to deal with cultural diversity) and tutorial (openness to receive suggestions and guidance to adapt to new situations, ability to manage student participation in the course and flow of teaching and administrative activities, organize and maintain a tutorial work routine).

Benefits of cooperation and assertiveness for a healthy life

Within a conceptual multiplicity attributed to cooperation, it can be characterized as the activity by which individuals act together to accomplish tasks for a common purpose. It refers to the way in which individuals combine their forces and knowledge to achieve the same objective, in an attitude that is proactive and participatory by all. For communities of practice, sharing information

and researching new tools, it can cooperatively initiate a continuous process of teaching-learning and research in the school context, inside and outside the classroom. There are multiple advantages of cooperative work for school life (Comoglio, Cardoso,1996; Formosinho, Machado, 2008; Formosinho,2009; Kaendler, Wiedmann,Rummel, Spada, 2015). According to Jardim and Pereira (2006), the competence of cooperation is the "ability to operationalize knowledge, attitudes and skills in order to act together, with a view to achieving a common goal, maximizing the potential of each individual in a durable and balanced way" (p.136). In the context of Education, cooperation thus consists of the ability to operationalize together knowledge, attitudes and skills with a view to achieving a common goal, maximizing the potential of each individual in a durable and balanced way translating improvements in group performance (Jardim, 2010; Galinha, São-João, 2020; Direção-Geral de Educação, 2020). According to Vaz-Pinto (2004), "learning to cooperate with others in the very act of learning, is to assume our own community condition, where each one is not alone, where Being Human is Being-with-the-Other". Still according to the same author (Vaz-Pinto, 2004) "learning, learning from others, valuing diversity, interacting, upwards, sideways, downwards, bringing down prejudices and common ideas". For Morin (2002), quoted by Cochito (2004), "it must be formed in the minds from the consciousness that the human being has to be both individual, part of a society and part of a species". "Each one of us carries within himself this triple reality. In the same way, all human development must include the joint development of individual autonomy, community participation and the consciousness of belonging to the human species". Camacho, Feliciano and Leite (2016) and Camacho, Joaquim and Menezes (2020) highlight that in view of these skills it is important for the teacher to recognize himself as a mediator of knowledge and learning. In the current scenario of social isolation in front of COVID-19 these competences assume new meanings, values and habits in which although information and communication technology is taken into consideration it requires a look for remote learning among teachers and students (Camacho, Joaquim, Menezes, Sant'Anna,2020).Interest in

the study of assertiveness in young adults has been growing among the scientific community. According to Lazarus (1971) assertiveness has been highlighted as a key competence related to the ability to express ideas and feelings among peers. Soon after, Jakubwski and Lange (Jakubowski, Lange,1978, 1976) added the importance of expressing beliefs in a direct way in order to respect the right of interlocutors. We can define mental health as a state of well-being in which the individual realizes his/her own capabilities, faces the normal tensions of life, works productively and contributes to his/her community. Mental health is also considered to be the social and economic circumstances that influence their immediate social environment including positive involvement with family members, friends or colleagues. We also consider in mental health the environmental factors: the wider socio-cultural and geopolitical environment of the family or community, including levels of access to basic goods and services, exposure to prevailing beliefs, attitudes or cultural practices, as well as nationally formed social and economic policies. In addition, to achieve the Sustainable Development Goal (SDG) of Agenda 2030, the health sector needs to address health in a comprehensive way by also addressing the needs of adolescents in all aspects. WHO leads the global multi-sectoral health and well-being response (WHOQOL, 1995). According to Jardim and Pereira (2006), improving assertiveness competence presupposes a systematic learning and balancing process in which one's own needs, purpose and surrounding circumstances must be considered. There are several benefits of assertive competence as a person, student and professional future in an optimization of psychological resources. Increasingly the importance of assertive training in various contexts allows for gains in multiple spheres, such as in education (Allen, Long, O'mara, Judd, 2007). The global assessment of assertiveness serves to assess competence and identify possible emerging improvements (Nunes, 2011). Assertiveness is conceived as a two-way behavior that emphasizes the importance of considering the desires, thoughts and feelings of both the sender and receiver of the assertive message (Vagos, 2019). Assertiveness is thus within psychological health a personal and social communicative competence predictive of

academic success within the adaptive sphere (Radmila, 2019). Assertiveness through verbal communication gains more prominence in distance communication, since in this type of teaching-learning, non-verbal communication is small compared to the face-to-face context in the expression of knowledge, ideas and feelings among peers in pedagogical training. Distance learning also promotes a variety of personal and social skills associated with the perception of

Method

This is a quantitative, cross-sectional study. Themethodology will seek to answer the following research questions:

Q1: Are there protective factors with respect to maintaining higher levels of cooperation and assertiveness, compensate for the absence of mobility imposed by confinement?

Q2: In this exceptional period of public health to which the study reports, the respondents in distance education keep assertiveness and cooperation levels on the average?

Q3: Is there an association between these variables: social support and age; mobility (ways of transport) and academic degree?

Q4: Is Cooperation associated with: age, academic degree, and mobility?

Q5: Is Cooperation associated with: gender, and social support?

Q6: Is Assertiveness correlated with cooperation?

Q7: Is Assertiveness associated with age, academic degree, mobility, gender, and social support?

Q8: What are the most valuable items in EAGCand EAGA?

Methodology

The statistical methodology used was descriptive and inferential. The data analysis was performed using R software, version 3.6.1 (R Core Team, 2019).

Data Analysis

This study involves a sample of 329 higher Portuguese education students. Regarding the sociodemographic profile, most of the participants

social support even in periods or phases of isolation. The family as a social support plays a fundamental role in the life of the individual, in the strengthening of social and cultural relations in the achievement of skills, in the optimization of affective, social and cognitive relations, arising from the experiences of the social group to which it belongs and its different historical, material and cultural conditions (Baptista, Teodoro,2012; Dessen, 2010; Dessen, Polonia, 2007)

are females (84%), single (92%), live with their families (67%) and the minority (8%) lives within inn sharing accommodation. The average age is 24 years old (± 9 years sd). The distribution of education level among students: level 5 UE courses (10%), bachelor (67%), postgraduate (2%), master (14%) and PhD (6%). The distance traveled (one way) from address to school were: < 5 km (31.78%); [5,10[km (14.02%); [10,30[km (24.92%); [30, [(22.43%). 6.85% of students reported not knowing the distance of the journey. The ways of transport used before pandemic crisis: by foot (22%); public transports (60%), own car (17%) and cycling (1%). A random sampling method was used. The datacollection tool used was electronic questionnaires sent at random to Portuguese higher education institutions. The reliability and validity of the data was ensured by a computer application that disseminated the questionnaires to higher education institutions, and it was not possible that the same student could fill in more than one questionnaire. The used instruments were, beyond a demographic questionnaire to characterize the students, the methodological guidelines provided by Jardim and Pereira (2006) were used in the overall assessment of cooperation in the academic community (EAGC Scale) and assertiveness (EAGA Scale). Both scales are assessed on a five-point Likert scale (1- never, 2- rarely, 3- sometimes, 4-often, 5-always)consisting of 9 and 8 items, respectively. The EAGC is a self-registration Likert type scale with the following items: 1: When I work in a team I like to collaborate with my colleagues; 2: I think that cooperation helps to develop new ideas; 3: When I work in a group, I feel that everyone's contribution is important; 4: I like to work in a group more than individually; 5: I appreciate teamwork, especially for the great moments that provides; 6: The more I work in group with

colleagues, the more I appreciate them; 7: Group work makes me enjoy attending my teaching school work; 8: I prefer to evaluate in a group rather than individually; item 9: When I work in a group I have a much better return.

The EAGAis composedwith the following items:item 1: Usually I express my ideas; item 2: In a conflict situation, I usually know when to be firm and not to give in; item 3: Normally I defend my rights; item 4: I can refuse with something that I don't agree with; item 5: When I disagree with someone, I would express it convincingly; item 6: I usually speak as long as necessary to state my views; item 7:Normally I speak in a clear and audible tone of voice; item 8: When and if I feel offended, I manifest it directly.The results obtained to research questions will be presented below.

Results

Sociodemographic variables were also used, which seemed promising in contextualizing, interpreting, and discussing the results. Sociodemographic aspects present in the sample such as: young adult age group, degree of education attended, family social support and distance learning, are protective factors with respect to maintaining higher levels of cooperation and assertiveness, compensate for the absence of mobility imposed by confinement.

Table 1 summarizes the results regarding the relationship between the variables under study.

Table 1. Results of statistical association between variables under study

Variables	Statistical Test	p-value
Association		
Social support and age category	FET	0.002
Mobility and academic degree	CST	0.029
Age category and cooperation	FET	0.046
Academic degree and cooperation	FET	0.007
Mobility and cooperation	FET	<0.001
EAGC and EAGA	SRCC (0,125)	0.025

FET:Fisher´s Exact Test; CST: Chi-square Test; SRCC:Spearman's Rank Correlation Coefficient

Table 2,shows that there were no statistically significant associations in the following set of variables:

Table 2. Results of no statistical association between variables under study

Variables	Statistical Test	p-value
No association		
Gender and cooperation	FET	0.896
Social support and cooperation	FET	0.394
Gender and assertiveness	FET	0.735
Social support and assertiveness	FET	0.5
Age category and assertiveness	FET	0.809
Mobility and assertiveness	FET	0.121
Academic degree and assertiveness	FET	0.548

FET:Fisher´s Exact Test

There is a statistically significant and positive correlation between cooperation and assertiveness (p-value=0.025) expressed through Spearman's rank correlation coefficient (0.125).

Table 3 presents that items 8 and 4 of the EAGC scale are those with an average score below the center of the scale (3-sometimes) 2.65 and 2.89 respectively.

As we can observe from Table 4, the EAGA scale shows that all items have an average score above the centre of the scale, particularly for items 3 and 1 with higher average scores (4.13 and 3.94).

Table 3. Percentages of responses given by students by items and levels of EAGC

	Mean (sd)	Levels				
		1:Never	2	3	4	5:Always
item 1	3.25 (0.84)	3.43%	15.58%	33.96%	47.04%	0%
item 3	3.25 (0.84)	3.12%	16.51%	33.02%	47.35%	0%
item 9	3.05 (1.04)	7.17%	20.56%	41.43%	21.5%	9.35%
item 6	3.43 (0.95)	3.12%	10.59%	38.94%	34.58%	12.77%
item 2	3.37 (0.72)	0.93%	11.21%	37.68%	50.16%	0,00%
item 8	2.65 (1.23)	23.99%	18.69%	33.96%	14.95%	8.41%
item 4	2.89 (1.09)	11.53%	22.43%	40.19%	17.13%	8.72%
item 5	3.46 (1.08)	4.98%	11.53%	34.58%	29.91%	19%
item 7	3.21 (1.14)	7.17%	20.25%	31.46%	26.17%	14.95%

Description of the items: item 1:When I work in a team I like to collaborate with my colleagues; item 2: I think that cooperation helps to develop new ideas; item 3:When I work in a group, I feel that everyone's contribution isimportant; item 4:I like to work in a group more than individually; item 5:I appreciate teamwork, especially for the great moments that provides; item 6:The more I work in group with colleagues, the more I appreciate them; item 7:Group work makes me enjoy attending my teaching school work; item 8:I prefer to evaluate in a group rather than individually; item 9:When I work in a group I have a much better return.

Table 4. Percentages of responses given by students by items and levels of EAGA

	Mean (sd)	Levels				
		1:Never	2	3	4	5:Always
item 5	3.72 (0.88)	0.31%	8.81%	28.62%	43.4%	18.87%
item 8	3.53 (1.06)	2.2%	15.09%	31.13%	30.19%	21.38%
item 1	3.94 (0.84)	0.31%	4.39%	22.88%	45.45%	26.96%
item 7	3.88 (0.85)	0.63%	5.03%	23.58%	46.86%	23.9%
item 3	4.13 (0.80)	0.31%	2.52%	16.98%	44.03%	36.16%
item 2	3.75 (0.85)	0.94%	4.72%	31.45%	44.03%	18.87%
item 6	3.75 (0.92)	0.94%	9.12%	24.84%	44.34%	20.75%
item 4	3.56 (0.94)	1.26%	8.81%	41.82%	28.93%	19.18%

Description of the items: item 1:Usually I express my ideas; item 2: In a conflict situation, I usually know when to be firm and not to give in; item 3:Normally I defend my rights; item 4:I can refuse with something that I don't agree with; item 5:When I disagree with someone, I would express it convincingly; item 6:I usually speak as long as necessary to state my views; item 7:Normally I speak in a clear and audible tone of voice; item 8:When and if I feel offended, I manifest it directly.

Discussions

According to the results in table 1, we can observe that there is an association in the following set of variables:social support and age category; mobility (ways of transport) and academic degree; age category and cooperation; academic degree and cooperation; mobility and cooperation.

In Table 2,in opposition, there were no statistically significant associations in the following set of variables: social support and cooperation; gender and assertiveness; social support and assertiveness; age category and assertiveness; mobility and assertiveness; academic degree and assertiveness.However, there is a statistically significant and positive correlation between cooperation and assertiveness expressed through Spearman's rank correlation coefficient.

On the EAGC scale (Table 3), item 5 was the one with the highest concentration of responses (19%) at the highest level of the scale (5-always). The items with the highest concentration at the highest levels of the scale are items 2.3 and 1 respectively with 50.16%, 47.35% and 47.04%, which means a greater tendency for cooperation to promote new ideas, group/teamwork and assessment of individual contribution within a team.

On the EAGA scale (Table 4), items 4 and 8 are those with the highest percentage of responses at the lower levels of the scale together with the intermediate level (3-sometimes), contributing to lower average values. Students are excel in assertiveness. As far as cooperation is concerned, much of the results now obtained are in line with the works of Comoglio and Cardoso (1996); Jardim and Pereira (2006), Formosinho and Machado (2008); Formosinho (2009); Kaendler, Wiedmann, Rummel and Spada (2015); Camacho,

Joaquim and Menezes (2020); Camacho, Joaquim, Menezes and Sant'Anna (2020); Araújo, Lima, Cidade, Nobre and Neto (2020)

Conclusion

The results now obtained in this research go in the direction of the works of Lazarus (1971), Jakubwski and Lange (1978,1976), Lloyd (1993), Nunes (2011), Pereira, Motta, Vaz, Bernardino and Melo (2006), Allen, Kathleen, O'mara and Judd (2007), Dixe, Custódio, Catarino, Ventura, Loreto, Carrasqueira, et al (2010), Carmo and Franco (2019), Vagos (2019), FVG (2020) regarding assertive characteristics; in the social support works of Dessen and Polonia (2007), Dessen (2010), Baptista and Teodoro (2012), Castedo, Pino-Juste and Alonso (2015), Mitamura (2017), Maldonado et al. (2020), Heiberger and Robbins [63], Bryer, at al. (2014), Kennedy (2018), Monjas (2002) and Snow (2020). As far as assertiveness is concerned, they are in accordance with Pereira and Jardim (2006). The present scales may prove to be a contribution to sustainability in education, particularly in periods of confinement and emergency.

Limitations and Future Studies

Suggestions for future studies: faced with a longer time horizon, the possibility of conducting a case-control study to assess levels of cooperation and assertiveness.The future possibility of a larger sample with students from several countries/regions, supported by a longitudinal study design, will allow determining the influence and impact of these variables on both scales (EAGC and EAGA) in different contexts as well as the evolution of the levels of cooperation and assertiveness.

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