EXPLORATORY MODEL OF QUALITY OF LIFE IN THE COVID-19 ERA

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ABSTRACT

The objective of this work was to validate a scale of quality of life in the face of Covid-19. A cross-sectional design was carried out with a correlational study and a sample of 100 students studying undergraduate in a virtual classroom and working temporarily. A factorial structure was found that explained 66% of the variance, although the results are only attributable to the sample, they suggest the extension of the study towards distance learning and asynchronous teaching scenarios.

Keywords: Quality of life, life satisfaction, group norms, availability of resources, perceived capacities.

INTRODUCTION

As of this writing, the SARS-CoV-2 pandemic and the Covid-19 disease have claimed the lives of around a million people, although asymptomatic cases are recognized as a source of transmission that would increase considerably the deaths labeled as atypical pneumonia (Elizalde González, 2020). In this scenario, health policies, focused on mitigating and containing the pandemic, have established distancing and social confinement as a strategic measure (Laureiro & Sa, 2020). The impact on the educational system, mainly the higher level by accelerating the transition from traditional to virtual classroom. It is an asynchronous system in which administrators, teachers and students reproduce the asymmetries observed in the traditional classroom to the virtual one, such as their level of quality of life. In this way, measuring the impact of the pandemic in the virtual classroom, considering the levels of quality of life, will allow the evaluation of health policies regarding distancing and social confinement, as well as anticipating scenarios of exclusion and inclusion of teachers and students in the virtual classroom (Dhawan, 2020).

However, the instruments that measure quality of life are distinguished by establishing dimensions allusive to the traditional classroom, but they do not contemplate the scenario of confinement and social distancing as strategies for containment and mitigation of the pandemic. This is so because the design of the instruments was carried out from theoretical and conceptual frameworks in which quality of life only considered risks, contingencies and threats as probable scenarios. In the current context, these scenarios would be reflected in the quality of life of people in confinement and social distancing, as is the case of the virtual classroom (Kim & Kang, 2020). Consequently, the theories that

explain these uncertain scenarios together with the traditional theories would explain a higher percentage of the total variance of the quality of life.

In this section the theoretical and conceptual frameworks such as the Human Capital Theory (HCT), the Intellectual Capital Theory (ICT), the Technology Acceptance Theory (TAT), the Consumption Theory are exposed. Electronic (ECT). Before the SARS CoV-2 pandemic, human capital was assumed as a result of public policies aimed at investment in health, education, science and technology (Aretio, 2021). The programs and strategies for evaluation, accreditation and certification of the quality of academic processes and products determined the level of human capital. It was an isomorphic structure in which the quality of academic life would reflect neoliberal policies.

However, the generality of public policies and their effects on the evaluation of the educational system led to an academic isomorphism that took the strategic guidelines of knowledge management, production and transfer to the extreme. Human capital was replaced by intellectual capital to explain the transformation of a talent to an intangible asset in organizations (Sanchez Medina et al., 2007). It was a management system that not only separated knowledge from other human capacities, but also structured the feasibility of knowledge according to the guidelines of the international market. In this way, the quality of life of intellectual capital revolved around the specialization and updating of scientific and technological innovations.

In this process of transition from human capital into intellectual capital aimed at being an intangible asset of institutions and organizations, technology emerged as an instrument of academic, professional and labor training, education and training (García et al., 2006). Human capacities and intellectual abilities were oriented to the selection, processing and dissemination of information with the purpose of establishing an agenda to intensify the quality of academic processes and products. Human capital in its transformation to intellectual capital and its consolidation into intangible assets was oriented towards the acceptance of technology at the same time as the adoption of electronic consumption (López & Mejía, 2016). In this process, quality of life was an indicator of the effect of evaluative policies on education, academic, professional and work training. Often, it was observed in the management, production and transfer of knowledge. In other words, the computational abilities and skills of selection, processing and dissemination of information were directed as a sequence of electronic consumption (Sánchez, 2007). This was so because the usefulness and risks of adopting digital protocols complemented traditional leadership training as a distinctive feature of human and intellectual capital.

During the SARS CoV-2 pandemic, the axes, trajectories and relationships of human, intellectual, technological and electronic capital are being observed in the transition from the traditional classroom to the virtual classroom (Lizaraso Caparó & Jorirse, 2020). Distance or platform-mediated training protocols in asynchronous modes have enriched the transformation of human capital into electronic assets but reduced their quality of life. In this section, the most recent studies on quality of life as an effect of the virtual classroom are exposed, highlighting the stalking, harassment, ridicule and anxiety pathologies reported in the literature (Gulliana Cedillo-Ramirez, 2020). The confinement and distancing of people has led to an intensive use of technology, devices and networks, but by reducing direct and synchronous interaction it has increased the differences between men

and women, specialists and lay people, as well as increased pathologies associated with the use of Internet.

The quality of life in the traditional classroom happened to be a positive effect of evaluative policies such as productivity indices; impact factor of publications, indexing in repositories or reputation of the institution to indicators of stalking, harassment, ridicule, anxiety and addiction to the Internet, devices and digital networks (Herrera-López et al., 2017). It is true that in the traditional classroom peer violence such as bullying and bullying were already present, although in the virtual classroom they were associated with impersonation, fraud and discredit.

However, the substantial difference between quality-of-life studies in a distant and asynchronous environment is observed in formative rather than reflective relationships. This is the case of the simulation of professional practice that can be carried out with props or virtual technology, but without being equipped to the patient's reactions in the clinical area (Machado et al., 2020). Unlike research prior to the pandemic where quality of life was explored as a construct, quality of life during the pandemic is considered a direct and indirect effect of the confinement and distancing of people, the virtual classroom being a factor mediator. In this section, the axes, trajectories and relationships between the variables regarding the quality of life in the virtual classroom during confinement and social distancing are exposed, considering their impact on mental health. Given that quality of life is a variable that reflects levels of well-being and satisfaction before the pandemic, during the pandemic it will be determined by degrees of confinement and social distancing mediated by the virtual classroom.

However, the quality of life when reflecting degrees of well-being or satisfaction suggests being determined by contingent variables or those related to people's environment. In such a process, mediating variables such as demands or resources reduce or increase this effect. In this sense, the measurement of reflective relationships supposes the weighting of formative relationships (Ye et al., 2020). This is so because the theoretical and conceptual frameworks allowed the design of instruments that considered quality of life as a second order variable in which other variables related to well-being and satisfaction are reflected (Urzúa & Caqueo-Urízar, 2012). Scales and inventories consolidated the measurement of quality of life based on objective indicators such as the demands of the environment and the resources of institutions, but they ignored human and intellectual capacities. Faced with the limitations of theories and concepts, hybrid approaches set out to explain the formative antecedents such as technology.

A theoretical hybrid would explain the variables that reflect the quality of life: justice, opportunity, norms, trust, satisfaction and resources. Even the variables that determine the quality of life: public, health, economic and educational policies, indicated by degrees of confinement and social distancing in settings such as the virtual classroom (Martinez-Martin et al., 2012). It is a hybrid model that includes reflective and formative relationships of quality of life.

Are there significant differences between the dimensions of quality of life reported in the literature before the pandemic with respect to the factors observed from the theoretical hybrid in the present work?

The premise that guides the present work refers to the fact that there are significant differences between the dimensions established in the literature with respect to the factors

found in the present work. This is so because the structural equation models are established by the formative or reflective relationships of the variables that factor them (Rizun & Strzelecky, 2020). It is their formative relationships that, by prevailing in risk events, show a watershed in theories, concepts and findings around a phenomenon such as quality of life in the virtual classroom during the SARS CoV-2 pandemic and the Covid-19 disease.

Thus, the present work includes a theoretical, conceptual and instrumental review that measures and explains the quality of life in a period from 2019 to 2021, as well as a proposal for modeling the factors subtracted from the consulted literature. In order to guide the review and observation, the methodological section is included. The results and the comparison with the selected studies are presented below. The implications of the instrument are included in the evaluation of health and educational policies in social distancing and confinement.

METHOD

Design: By virtue of the theoretical hybrid suggesting that the quality of life in the virtual classroom is an effect of confinement and social distancing, the design is longitudinal, although for the purposes of this study a cross section of the pretest will be exposed (González & Difabio, 2016). In this way, the type of research was explanatory by the relationships between the factors stated in the literature were contrasted with respect to the observations made in the present study.

Sample: A non-probabilistic selection of 100 students was made (M=20.13 SD=2.36 age and M=950.21 SD= $ 24.5 per month). The selection criteria were having a paid activity, internet service and having been enrolled in the school period.

Instrument: A Quality-of-Life Questionnaire was constructed from the educational, technological and labor dimensions, depending on the factors of resource availability, social reliability, social justice, choice opportunities, selection skills and satisfaction perceptions Table 1.

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Table 1			
VARIABLES OPERATIONALIZATION			
Factor	**Definition**	**Code**	**Consideration**
Life satisfaction	Degree of evaluation of public services (education, technology and employment)	SV1, SV2, SV3	0=not at all satisfactory, 1=very unsatisfactory, 2=not very satisfactory, 3=very satisfactory
Expected capacities	Level of educational, technological and employment choice skills	CE1, CE2, CE3	0=not at all preferable, 1=very little preferable, 2=little preferable, 3=very preferable
Trust relationships	Degree of credibility in the authorities regarding education, technology and employment	RC1, RC2, RC3	0=not at all preferable, 1=very little preferable, 2=little preferable, 3=very preferable
Perception of justice	Level of evaluation of the public administration in educational, technological and labor matters	PJ1, PJ2, PJ3	0=not at all desirable, 1=very undesirable, 2=undesirable, 3=very desirable
Opportunity expectations	Degree of freedom of educational, technological and labor choice	EO1, EO, EO3	0=not at all optional, 1=very little optional, 2=little optional, 3=very optional
Assessment of the environment	Level of access to educational, technological and labor public	VE1, VE2,	0=not at all efficient, 1=very inefficient, 2=not very efficient,

	services.	VE3	3=very efficient
Context rules	Degree of distribution of educational, technological and labor public services	NC1, NC2, NC3	0=not at all appreciable, 1=very little noticeable, 2=not very noticeable, 3 = very noticeable
Resources received	Level of availability of resources through educational, technological and labor services.	RP1, RP2, RP3	0=not at all cooperative, 1=very uncooperative, 2=not very cooperative, 3=very cooperative
Source: self-made; SSV=Life Satisfaction Subscale, SCE=Expected Capabilities Subscale, SRC=Trust Relationships Subscale, SPJ=Justice Perception Subscale, SEO=Opportunity Expectations Subscale, SVE=Environment Assessment Subscale, SNC=Subscale of Context Norms, SRP=Perceived Resources Subscale			

Procedure: The page of the public university housed the questionnaire where the students accessed with the registration code, after processing before the authorities of the institution. The respondents signed an informed consent type section where they were presented with the person in charge of the project and their role, explaining that their responses would not generate any monetary benefit or affect their academic status. At the time of solving the questionnaire, the interviewees were instructed to write down any doubts they might have regarding the survey.

Analysis: Once collected, the information was captured in the Statistical Package for Social Sciences (SPSS) version 21.0 in order to estimate the multivariate parameters in the Analysis of Structural Moments (AMOS) version 6.0. A reliability analysis was carried out, assuming internal consistency or Cronbach's alpha. Subsequently, the validity of the construct was estimated, after sphericity and suitability of the instrument to the study sample. Next, bivariate correlations and multivariate covariances were estimated to anticipate causal relationships in structural models, fit and residuals.

Reliability: The internal consistency of the items with respect to the scale was weighted with Cronbach's alpha statistic (Ortiz, 2015). Values greater than 0.60 and less than 0.90 were assumed as evidence of symmetric relationships between the items and the psychological traits that were intended to be measured.

Validity: The adequacy was weighted with the Kaiser Meyer Olkin parameter in which values greater than 6.00 were considered as a requirement for the validity of the construct. Sphericity was also estimated with the Bartlett test, the chi-square value close to unity and a significance level less than 0.05 were assumed as a second requirement for the exploratory factor analysis of principal components, with varimax rotation. Correlations between the item and the factor greater than 0.300 were assumed as indicators of a construct. Regarding the percentages of explained variance, results greater than 20% were considered as evidence of adjustment of the model specifications, with respect to the observed data.

Correlation: Pearson's r parameter was used to calculate the negative or positive relationships between the factors established in the validity of the construct (Zubaran et al., 2008). Those values close to zero and unity (in absolute value) were assumed as spurious and collinear relationships. Instead, the values between the extremes were considered as probable dependency associations. The "*phi*" estimate was used to establish the association between one factor and another in reference to the other factors. Like the correlation, the values were identified as spurious, collinear and dependency relationships.

Structure: "*Phi*" parameters were used to estimate covariances, "*gamma*" statistics to estimate the regression of exogenous factors to mediators, "*beta*" parameters for the regression of mediating factors to endogenous factors. The statistics "*delta*", "*epsilon*" and "*sigma*" were used to calculate the measurement errors of exogenous indicators, and indicators of endogenous factors, as well as the variability of endogenous factors. The criterion to interpret the values close to zero and to unity was also considered for the mentioned parameters.

Adjustment: The contrast of the model was carried out from the estimation of the Goodness of Fit Index (GFI for its acronym in English). Values close to unity were considered as evidence of acceptance of the null hypothesis. The contrast of the model was also carried out from the calculation of the Mean Square Approximation Error (RMSEA). Values close to zero were considered as evidence of fit of the specified model with respect to the data obtained.

RESULTS

The reliability of factors 1 to 8 (alphas between 0.718 and 0.791) shows a regular consistency between the items since the general reliability of the instrument was 0.769. In other words, the internal consistency of the instruments suggests a systematic measurement of quality of life, even when it was generated during the pandemic. In order to be able to observe the structure of the relationships between the factors that explained 66% of the variance, the correlations were estimated. The adequacy and sphericity [KMO=0, 574; $\chi2=10.31$ (17 gl) p=0.000] suggested the exploratory factor analysis of principal axes with promax rotation. It is a factor structure that explains 66% of the variance, suggesting the inclusion of other factors that the literature identifies as informative pathologies Table 2.

Table 2
SUBSCALE VALIDITY

	M	SD	A	F1	F2	F3	F4	F5	F6	F7	F8
			0,791								
r1	4,35	1,36			0,356						
r2	4,01	1,27			0,451						
r3	**4,47**	1,49			0,478						
			0,752								
r4	4,47	1,37				0,591					
r5	4,56	1,69				0,394					
r6	**4,71**	1,41				0,621					
			0,783								
r7	4,51	1,51					0,412				
r8	**4,94**	1,48					0,512				
r9	4,04	1,93					0,325				
			0,764								
r10	4,57	1,29						0,412			
r11	4,59	1,15						0,587			
r12	**4,27**	1,36						0,324			
			0,775								
r13	4,46	1,72							0,472		
r14	4,58	1,59							0,384		
r15	**4,14**	1,31							0,481		
			0,746								
r16	4,46	1,49								0,412	

Item	M	SD	A							F7	F8
r17	4,38	1,32								0,382	
r18	**4,03**	1,26								0,482	
			0,727								
r19	2,47	1,48									0,413
r20	**2,70**	1,59									0,482
r21	2,36	1,63									0,583
			0,718								
r22	2,45	1,26									0,351
r23	2,14	1,56									0,486
r24	**2,75**	1,21									0,631

Source: prepared with the study data; M=Mean, SD=Standard Deviation, A=Cronbach's Alpha. Suitability (KMO=0.574), Sphericity [χ2=10.31 (17gl) p=0.000]. F1=Life Satisfaction Factor (22% of the total explained variance), F2 = Expected Capabilities Factor (16% of the total explained variance), F3=Trust Relations Factor (12% of the explained variance), F4=Justice Perception Factor (10% of the explained variance), F5=Opportunity Expectations Factor (6% of the explained variance), F6=Environment Assessment Factor (3% of the explained variance), F7=Factor of Context Norms (2% of the explained variance), F8=Perceived Resources Factor (1% of the explained variance)

Both "*r*" and "*phi*" correlations suggest a structure configured by axes, trajectories and relationships between the variables related to the quality of life in the virtual classroom, both in confinement and in distancing people Table 3.

Table 3
CORRELATIONS BETWEEN THE FACTORS

	F1	F2	F3	F4	F5	F6	F7	F8	F1	F2	F3	F4	F5	F6	F7	F8
F1	1,000								1,825							
F2	0,661*	1,00							0,672	1,935						
F3	0,372*	0,692*	1,00						0,482	0,681	1,725					
F4	0,461**	0,491*	0,681*	1,00					0,592	0,593	0,671	1,868				
F5	0,582*	0,395**	0,493*	0,613*	1,000				0,393	0,692	0,484	0,671	1,938			
F6	0,482***	0,591**	0,597**	0,492**	0,615***	1,000			0,610	0,482	0,596	0,415	0,687	1,836		
F7	0,481*	0,391*	0,570*	0,582**	0,526*	0,695*	1,000		0,413	0,396	0,686	0,581	0,314	0,682	1,738	
F8	0,493*	0,619*	0,625*	0,481*	0,593**	0,314*	0,621*	1,000	0,382	0,481	0,729	0,624	0,491	0,624	0,635	1,829

Source: Prepared with the data of the study; F1=Life Satisfaction Factor, F2=Expected Capabilities Factor, F3=Trust Relations Factor, F4=Justice Perception Factor, F5=Opportunity Expectations Factor, F6=Environment Assessment Factor, F7=Factor of Context Norms, F8=Perceived Resources Factor: * p <, 01; ** p <.001; *** p <.0001

Regarding the dependency relationships between the factors, they demonstrate formative and reflective axes, trajectories and relationships of the quality of life in the virtual classroom, considering the policies of confinement and social distancing Table 4.

Table 4
DEPENDENCY RELATIONSHIPS BETWEEN FACTORS

		Mediation		**Determinants**
			β= 0,341	F3
F1	β=0,626	F6	γ=0,616	F4
F2	β=0,628	F7	γ=0,617	F5
			β=0,641	F8
F3	β=0,631	F8	γ=0,631	F1
F4	β=0,624	F1	γ=0,637	F2
F5	β=0,676	F2	γ=0,652	F3
			β= 0,374	F4

Source: Prepared with the data of the study; F1=Life Satisfaction Factor, F2=Expected Capabilities Factor, F3=Trust Relations Factor, F4=Justice Perception Factor, F5=Opportunity Expectations Factor, F6=Environment Assessment Factor, F7=Factor of Context Standards, F8=Perceived Resource Factor; β=Influence of a determining or mediating factor on a target factor; γ=Incidence of a determining factor on a mediating factor.

The fit and residual parameters [$\chi2$=10.35 (10gl) p=0.000; GFI=0.995; RMR=0.008] suggest the non-rejection of the null hypothesis. That is, the differences are not significant between the factors reported in the literature and the factors established in the present study. In other words, the effects of social distancing and confinement in the virtual classroom during the pandemic are consistent with the relationships found in the literature Figure 1.
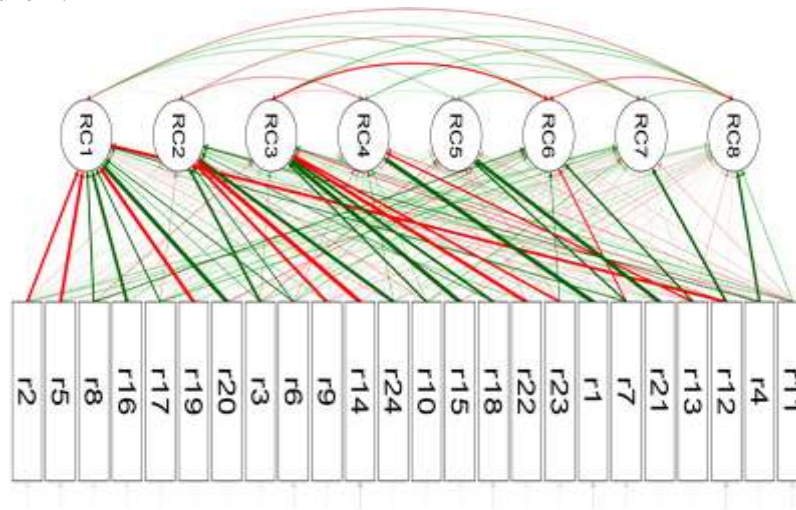
FIGURE 1
STRUCTURAL EQUATION MODELLING
Source: elaborated with data study

DISCUSSION

The contribution of this work to the state of the question lies in the contrast of a hybrid model of relationships between the variables that form the quality of life and the variables that reflect it in the virtual classroom during the pandemic. The results are attributable to the sample, suggesting the extension of the study to other scenarios and

samples to give validity to the instruments. Regarding the theoretical hybrid, made up of the concepts of human, intellectual, technological and electronic capital, which emphasizes the incidence of the demands of confinement and social distancing on informational capacities, this work warns that the structure of quality of life is made up of eight explanatory factors of the phenomenon. Future lines of research related to confinement as a measure against outbreaks of the coronavirus will allow us to anticipate quality of life scenarios in the virtual classroom.

Regarding quality-of-life studies that enhance informational pathologies as effects of confinement and social distancing in electronic technologies, devices and networks, the present work found eight factors that explained 66% of the total variance. Lines of study related to the factorial structure of quality of life will allow corroborating or increasing the percentage of explained variance, considering the exclusion and inclusion of indicators allusive to informational pathologies. In relation to the modeling of the explanatory variables of the quality of life, the present investigation demonstrated axes, trajectories and relationships between predictive factors. The observation and contrast of the proposed model in other scenarios will allow anticipating significant differences before and after the health crisis. Furthermore, the prediction of the factors related to information capacities will explain the incidence of confinement and distancing policies in their communicative dimension of risks.

CONCLUSION

The objective of the present work was to establish the contrast of a model from a theoretical hybrid. The effect of the policies of confinement and social distancing in the virtual classroom was explained considering the formative and reflective variables of the quality of life. The results can only be applicable to the study sample, suggesting the extension of the work to other actors and institutional and educational sectors. The importance of establishing the validity of an instrument that measures quality of life lies in the construction of a public agenda. It is about the evaluation of confinement and social distancing strategies and programs in the virtual classroom. The discussion around government action in the face of the health crisis also refers to a virtual classroom program adjusted to the quality of life of Internet users.

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