Academic Adaptation to Remote Higher Education Questionnaire:
Adaptation and Psychometric Study with Universities

Adriana Satico Ferraz[1] 🆔

Amanda Lays Monteiro Inácio[2] 🆔

Jennifer Kerolly de Oliveira Barros Bathaus[3] 🆔

Acácia Aparecida Angeli dos Santos[3] 🆔

Abstract: Due to the need to understand the academic adaptation in the temporary transition from the in-person to the virtual modality, the general objective of this research is to adapt the Academic Adaptation to Higher Education Questionnaire for remote teaching. The specific objectives are to investigate their evidence of content validity and internal structure-based validity and reliability estimates. The questionnaire was adapted for remote teaching in the first stage of the research. The questionnaire was, then, evaluated by three judges and 12 students, whose results evidenced the content validity. Subsequently, 319 students answered the questionnaire. With confirmatory factor analysis, a plausible model was identified, containing five factors (Institutional, Social, Study, Personal-Emotional, and Career Planning), indicating validity based on the internal structure. Additionally, the questionnaire showed adequate accuracy indices ($\omega > .85$). The practical implications are traced, and we also suggest for the questionnaire to be adjusted for the hybrid teaching modality.

Keywords: higher education, college environment, college students, educational technology, psychometrics

Questionário de Adaptação ao Ensino Superior Remoto:
Adaptação e Estudo Psicométrico com Universitários

Resumo: O objetivo geral desta pesquisa foi adaptar o Questionário de Adaptação ao Ensino Superior para a modalidade de ensino remoto. Os objetivos específicos foram investigar as suas evidências de validade de conteúdo e baseada na estrutura interna, e as estimativas de fidedignidade. O estudo constituiu-se de três etapas. Na primeira etapa adaptou-se o questionário para o ensino remoto. Na etapa subsequente, o questionário foi avaliado por três juízes e 12 estudantes, cujos resultados evidenciaram a validade de conteúdo. Na última etapa 319 estudantes responderam ao questionário. Identificou-se mediante análise fatorial confirmatória um modelo plausível contendo cinco fatores (Institucional, Social, Estudo, Pessoal-Emocional, Planejamento de Carreira), indicativo de evidência de validade baseada na estrutura interna. Adicionalmente, o questionário apresentou índices adequados de precisão ($\omega > 0,85$). As implicações práticas são trazidas e sugere-se a adequação do questionário para a modalidade de ensino híbrido.

Palavras-chave: ensino superior, ambiente universitário, estudantes universitários, tecnologia educacional, psicometria

Cuestionario de Adaptación a la Educación Superior Remota:
Adaptación y Estudio Psicométrico en Universitarios

Resumen: Debido a la necesidad de comprender la adaptación académica en el tránsito temporal de la modalidad presencial a la virtual, el objetivo general de esta investigación fue adaptar el Cuestionario de Adaptación a la Educación Superior Remota. Los objetivos específicos fueron investigar su validez de contenido, basada en la estructura interna y la confiabilidad. En la primera etapa, se adaptó el cuestionario. En la segunda, el cuestionario fue evaluado por tres jueces y 12 estudiantes, cuyos resultados evidenciaron la validez de contenido. En la última etapa, 319 estudiantes respondieron el cuestionario. A partir del análisis factorial confirmatorio se identificó un modelo plausible de cinco factores (Institucional, Social, Estudio, Personal-Emocional, Planificación de Carrera), indicando la validez basada en la estructura interna. El cuestionario mostró índices de precisión adecuados ($\omega > .85$). Se exponen las implicaciones prácticas, y se sugiere la adecuación del cuestionario para la modalidad de enseñanza híbrida.

Palabras clave: educación superior, ambiente universitário, estudantes universitários, tecnologia educacional, psicometría

---

[1]*Centro Universitário de Brasília, Brasília-DF, Brazil*

[2]*Universidade Estadual Paulista, Assis-SP, Brazil*

[3]*Universidade São Francisco, Campinas-SP, Brazil*

Correspondence address: Adriana Satico Ferraz. Centro Universitário de Brasília, SEPN 707/907 - Asa Norte, Brasília-DF, Brazil. CEP 70.790-075. Email: adrianasatico.as@gmail.com

Emergency Remote Teaching (ERT) was implemented in Brazilian higher education institutions (HEIs) in the first half of 2020 to continue the school year amid the expanded social distancing measures to contain the COVID-19 pandemic (Ministry of Education, 2020). This teaching modality has the specificity of employing Information and Communication

Technologies (ICTs), previously used solely as supporting media, as the protagonists of teaching and learning in remote classes, while still maintaining the pedagogical project of in-person teaching (Rondini et al., 2020). This situation brought a series of difficulties for the students in managing their studies, establishing and/or maintaining interpersonal relationships, maintaining their emotional stability, and in accessing the online classes, either due to the lack of financial resources or the lack of skills to manage the technological instructional resources (Amaral & Polydoro, 2020; Appenzeller et al., 2020).

Due to the demand for understanding the adaptation of students in this context, this research aims to adapt the Academic Adaptation to Higher Education Questionnaire (*Questionário de Adaptação ao Ensino Superior* – QAES) for remote teaching and, subsequently, to carry out psychometric studies (Ilha et al., 2020). The QAES is focused on in-person teaching and evaluates, via 40 items, the academic adaptation in a multidimensional perspective that addresses five dimensions: institutional, study, career planning, social, and personal-emotional (Ilha et al., 2020).

With the implementation of ERT, Ambiel et al. (2020) presented these dimensions of student adaptation to higher education in the format of a guide to help students, faculty, and other professionals of the HEIs to deal with the new academic routine. The undertaking of Ambiel et al. (2020) was based on the research of Ilha et al. (2020), Matta et al. (2017), and Teixeira and Costa (2017), who identified associations between the dimensions of student adaptation to higher education and academic experiences and expectations, self-assessment of academic performance, self-regulation for learning, and a sense of life purpose and optimism.

When dealing with remote teaching in the institutional dimension, Ambiel et al. (2020) emphasize the role of HEIs in adapting to virtual environments, which replaced physical spaces during the COVID-19 pandemic (e.g., service channels, libraries), and in offering, to some extent, financial support to students (e.g., negotiation of tuition fees at private HEIs, support for students who have moved to attend higher education in public HEIs). The study dimension focuses on study strategies, with emphasis on the development of skills to deal with information and communication technologies (ICTs) and self-regulation for learning. In the career planning dimension, career exploration is stimulated as a way to articulate academic training with professional expectations. In the social sphere, Ambiel et al. (2020) focus on the establishment of interpersonal relationships via technologies (e.g., social networks, interaction in the chats of virtual rooms). In turn, the personal-emotional dimension was limited to the promotion of self-knowledge and self-care, seeking to mitigate the negative impact on the physical and psychological well-being of students, professors, and others involved in HEIs considering the difficulties faced in the shift to a virtual teaching environment.

The adaptation of the QAES for remote teaching fosters psychoeducational assessment, suggested by Araújo (2017) as a tool to identify potential risk factors for academic dropout due to difficulties in adapting to higher education.

Appenzeller et al. (2020) verified that, in line with what is observed in the in-person teaching, incoming students presented more adaptation problems in ERT. Furthermore, Fior and Martins (2020) indicate that incoming students are the most prone to evade classes, with the risk of suspending the course or definitively withdrawing from higher education being higher in the ERT.

At this juncture, motivational losses also emerge compromising the quality of learning, which was verified by the reduction in student participation in classes and engagement in activities (Fior & Martins, 2020; Rabaiolli & Hansen, 2020). Regarding the health domain, there was an increase in physical and psychological fatigue due to the strain caused by the poor adaptation to the ERT, in addition to the uneasiness caused by the pandemic scenario (Rabaiolli & Hansen, 2020; Sanchez Jr. & Silva, 2020).

Thus, our study aims to provide Psychology and Education professionals, who work in Brazilian HEIs, an instrument to evaluate the students' adaptation to higher education, consistent with the specificities of remote teaching. The general objective of this research is to adapt the Academic Adaptation to Higher Education Questionnaire for remote teaching (QAES-R). By prioritizing the psychometric quality of the QAES adapted to the ERT, our specific objectives are to investigate (a) the evidence of content validity; (b) evidence of validity based on internal structure; (c) and the reliability estimates (American Educational Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NCME], 2014). Then, we will present the three stages of the study. The first consists of adapting the instrument; the second is the evidence of content validity, contemplating analysis of expert judges and target audience; and, finally, the third, covers the evidence of validity based on the internal structure and reliability estimates of the QAES-R.

Step 1. Adapting QAES for Remote Teaching

The adjustment of the Student Adaptation to Higher Education Questionnaire to assess the academic adaptation of remote teaching followed the International Test Commission guidelines (2017). For the contextual foundation, we used the theoretical and empirical literature regarding the routine of students who use ICTs and Virtual Learning Environments (VLEs) in remote classes (Amaral & Polydoro, 2020; Ambiel et al., 2020; Appenzeller et al., 2020; Sanchez Jr. & Silva, 2020; Soares et al., 2020).

The adaptation involved adjustments in the instruction to fill out the questionnaire and in the answer key, which was changed from a five-point Likert scale to a four-point Likert. The third answer key was removed because it indicated "I do not disagree, nor agree," which may cause a discontinuity in the level of agreement established by the other answers. Since it is located in the middle of the response keys and has a neutral connotation, this answer can lead to a response bias, which may compromise the psychometric properties of the psychological instrument (Gehlbach & Barge, 2012).

Table 1 shows the list of items corresponding to the five theoretical dimensions of the original QAES (Ilha et al., 2020), indicating the items that remained or were excluded, and those that were adapted or formulated to compose the version of the questionnaire for the new context. The QAES-R has 45 items, nine of which are representative of the Institutional, Career Planning, and Personal-Emotional Dimensions; 11 items are on the Study Dimension; and 7 are on the Social Dimension, based on the aforementioned research that addressed the multidimensional structure of adaptation to higher education (Ambiel et al., 2020; Island et al., 2020).

Table 1

Adjustment of the Student Adaptation to Higher Education Questionnaire (QAES) for Remote Teaching

QAES Dimensions	*N* remaining items	*N* deleted items	*N* adapted items	*N* new items
Institutional	1	2	5	3
Study	4	0	4	3
Career Planning	6	0	2	1
Social	0	0	7	0
Personal-emotional	8	1	0	1

Ethical Considerations

The project that derived this research report was approved by the Research Ethics Committee of the HEI with which it is linked to (No. 4,098,394). Therefore, this authorization covers all its stages. Notably, only students aged over 18 years participated in the study, upon reading and signing an informed consent form.

Step 2. QAES-R: Study of evidence of content validity – Analysis of expert judges

Methods

Participants

Three professors of Psychology courses, who accompanied the transition from the modality of in-person teaching to remote classes, participated as judges of this research. Two judges worked in private HEIs and one judge in private and public HEIs, located in the states of São Paulo and Paraná. Years of teaching of the professors ranged from three to 20 years.

Instruments

Judges Evaluation Protocol. This instrument was constructed by the authors of this study for the judges to evaluate the 45 items of the QAES adapted for remote teaching based on the four criteria of the Content Validity Coefficient – CVC (Cassepp-Borges et al., 2009). The validation criteria: clarity of language (CL), practical relevance (PR), and theoretical relevance (TR) are answered on a Likert scale, ranging from 1 "barely adequate" to 5 "very adequate." The fourth validation criterion, referring to the theoretical dimension (TD) is answered in the dichotomous format – "yes" or "no." The instrument was inserted in the Google Forms to be answered remotely.

Procedure

Data collection. The professors were selected from the contact network of the authors of this research (non-random sampling). Judges who had at least one year of teaching experience in in-person graduation course and who accompanied the transition from in-person to remote teaching during the COVID-19 pandemic were selected, as determined by Ordinance No. 343 (Ministério da Educação, 2020). The invitations to participate in the research and the link to evaluate the QAES-R were sent to the judges by email. The average time to answer the survey was 50 minutes.

Data analysis. Content Validity Coefficient (CVC). The calculations for the CVC validation criteria (CVC of the constant [CVCc] and total CVC [CVCt]) for the CL, PR, and TR were performed in a Microsoft Excel spreadsheet. The reference value of the CVCt < .80 and the qualitative analysis of the judges' observations on the items guided the reformulation and exclusion of items. Items with CVCt > .80 were maintained (Cassep-Borges et al., 2009). The TD was calculated using the Kappa Fleiss (*k*), in the online calculator available in http://justusrandolph.net/kappa/. As a criterion for maintaining an item, the value of *k* had to be greater than .40.

Study with the Target Audience

Methods

Participants

The sample consisted of 12 students from public and private HEIs located in the South and Southeast regions (M_{age} = 26.7; *SD* = 7.69 years), with the majority being male (75%). The students attended to the second to ninth semester, from eight in-person undergraduate courses, and they started remote classes at least three months prior to answering the questionnaire.

Instruments

Pilot Study Assessment Protocol. The protocol is composed of two parts. In the first part, students must evaluate the instruction and the response key of the QAES-R regarding language clarity and the presence of unknown and difficult to understand words. The second part focuses on the evaluation of the 45 items of the questionnaire, regarding the adequacy of its content with the reality experienced by the student and with the writing of the sentences (identification of similar and intelligible phrases). These topics were evaluated using a dichotomous answer key: "*yes*" or "*no*." Each part of the protocol has a space for the student to indicate their observations. The instrument was /inserted in Google Forms to be answered remotely.

Procedure

Data collection Students were recruited via the contact network of the researchers who conducted this study (non-random sampling). As inclusion criteria, students had to be aged over 18 years and have attended to at least one semester of their undergraduate course in the in-person modality. The WhatsApp messaging application was used to contact students and to send the survey link, answered remotely via Google Forms. The students took, on average, 30 minutes to answer the Pilot Study Evaluation Protocol.

Data analysis. Frequency analysis was applied to the close-ended responses of the Pilot Study Evaluation Protocol, which were performed in a Microsoft Excel spreadsheet. Students' observations were integrated into the quantitative analysis. Qualitative impressions of the QAES-R items were considered — which encompassed comprehensiveness, clarity, and pertinence — to decide on their permanence, reformulation, or exclusion (AERA et al., 2014).

Stage 2 results

In the judge's analysis (Step I), the 45 items of the QAES-R presented the CVCc > .80 and values of $k = 1$, except for two items of the Institutional Dimension, with $k = .33$, namely: "My professors are good at online classes" and "I am satisfied with the student support areas from the university I study (e.g., virtual library, online platform access tutorials, chats with teachers)." Table 2 indicates that the three validation criteria of the CVCt ranged from .85 to .91, considered adequate, as well as the k value, referring to the theoretical dimension of the adapted questionnaire. This result supported the permanence of the 45 items of the QAES-R, without the need for reformulations in its writing.

In the evaluation of the target audience (Step 2) the frequency values exposed in Table 3 indicate that the instruction, the labels of the answer keys, and the items of the QAES-R are intelligible. The students' observations supported the reformulation of two items, related to the Institutional and Study dimensions. Based on the result of this study, the 45 items of the QAES-R were maintained.

Table 2

Questionnaire for Student Academic Adaptation to Remote Higher Education (QAES-R) Content Validity Coefficient

QAES-adapted	CVCt			k	Agreement between judges
	CL	PR	TR	TD	
Institutional	.88	.89	.91	.7%	85.19%
Study	.90	.90	.90	1	100%
Career Project	.85	.87	.87	1	100%
Social	.88	.87	.87	1	100%
Personal and Emotional	.88	.87	.85	1	100%

Note. CVCt = Total Content Validity Coefficient; k = Kappa Fleiss; CL = Clarity of Language; PR = Practical Relevance; TR = Theoretical Relevance; TD = Theoretical Dimension.

Table 3

Evidence of Content Validity for QAES-R: Pilot Study

Part 1: Statement and response key labels	
1.Understanding of the instructions for completing the questionnaire	AF = 12 (100%)
2. Identification of confusing sections	AF = 0 (0%)
3. Identification of unknown words	AF = 0 (0%)
4. Understanding response key labels	AF = 11 (91.66%)
Part 2: Institutional Dimension Items	
1. Identification of similar content	AF = 1 (8.33%)
2. Difficulty understanding	AF = 0 (0%)
Items for Study, Career Project, Social, Personal-emotional Dimensions	
1. Identification of similar content	AF = 2 (16.66%)
2. Difficulty understanding	AF = 0 (0%)
Rewording of item	Reworded item
Institutional Dimension Items Remote classes meet my learning needs	Remote classes meet my theoretical learning needs
Study Dimension Item. The environment in my home is appropriate for watching the online classes	The environment in my home is appropriate for attending the online classes

Note. AF = Absolute Frequency.

Discussion of Step 2

The results of the analysis of expert judges and the target audience corroborate the evidence of content validity of the QAES-R. ERT is acknowledged to be centered on the figure of the professor, therefore, institutional measures should enable the interaction of these professionals with students via virtual learning environments (VLEs) (Correia et al., 2020; Soares et al., 2020). Thus, Correia et al. (2020) warn about the impairment of psychological well-being resulting from the perception of students in relation to passivity and the lack of control of their own learning in the ERT. Another point addressed in the institutional dimension of the QAES-R is consistent with the guidelines of Amaral and Polydoro (2020) regarding the flexibilization of the academic regulation while adapting the services offered by the HEIs for emergency situations, with special attention to students who present greater social vulnerability.

Regarding the content of the classes, Fossa et al. (2020) highlight that the didactic continuity of the elaborated activities should be encompassed in the adjustment of the Questionnaire of Student Adaptation to Higher Education for remote teaching. The adaptation to the study is also linked to the implementation of methodologies associated with the development of skills that help students and professors in the use of ICTs applied to VLEs. Regarding the health and well-being dimension of the QAES-R, we highlight the need for monitoring the frequency and intensity of symptoms that express mood instability and excessive physical and mental fatigue. Rabaiolli and Hansen (2020) consider that aspects related to mental health impairment result from psychological and economic frailty caused by the restrictions and losses caused by ERT and the COVID-19 pandemic. As highlighted by Ambiel et al. (2020), adaptation to career planning should also be considered as a possibility for students to reflect on their field of expertise and to make use of the different tools to have access to courses, lectures, podcasts, and other tools that broaden their professional horizons and align expectations with the course.

Step 3: Evidence of validity based on internal structure and reliability estimates of QAES-R

Methods

Participants

A total of 319 students (M_{age} = 26.25; SD = 9.5) participated in this study, from HEIs located in the five regions of Brazil. Most of the sample consisted of female students (n = 268; 84.01%) and students from private HEIs (n = 234; 73.35%). The students attended to courses in the following fields of knowledge: Human Sciences (n = 185; 58%), Health Sciences (n = 86; 26.96%), Applied Social Sciences (n = 31; 9.72%), Agricultural Sciences (n = 11; 3.45%), Linguistics, Literature, and Arts (n = 3; .94%), Biological Sciences (n = 1; .31%), Engineering (n = 1; .31%), and Exact and Earth Sciences (n = 1; .31%).

Instrument

Academic Adaptation to Remote Higher Education Questionnaire (QAES-R). The instrument has 45 items divided into five dimensions: Institutional, Study, Social, Personal-emotional, and Career Planning. The answer key is a 4-point Likert– labels ranged from "*Strongly Disagree*" to "*Totally Agree*."

Procedure

Data collection Data were remotely collected via the Google Forms. The link for the research was disseminated among the undergraduate students of the HEIs where the researchers work and in social networks by snowball sampling. To participate in the research, students had to accept the terms in the informed consent form.

Data analysis. Software programs used: JASP (Goss-Sampson, 2020) and Mplus, version 7.11 (Muthén & Muthén, 2012). Use of confirmatory factor analysis with estimation method: Weighted Least Square Mean and Variance Adjusted (WSLMV). Acquiescence was controlled by the random intercept (RI) method. To evaluate the plausibility of the model, the chi-square ratio divided by the degrees of freedom, $\chi^2/gl < .5$; the Root Mean Square Error of Approximation, RMSEA between $\leq .05$ and $.10$; the Confirmatory Fit Index and Tucker-Lewis Index, CFI and TLI $\geq .95$ and $.80$ (Marôco, 2014) was considered. Items presenting factor loadings lower than .40 in the model were excluded from the QAES-ER. This more conservative cut-off point was established to obtain a plausible model from a parsimonious set of items per factor. Thus, reliability was assessed by the McDonald's omega coefficient -ω total, with values $\geq .70$, qualified as adequate (Dunn et al., 2014). The parameters for interpreting the magnitude of the correlations between the factors of the QAES-ER were $r \geq .10$ and $.29$, small magnitude; $r \geq .30$ and $.49$, moderate magnitude; $r \geq .50$, large magnitude (Goss-Sampson, 2020).

Results

Table 4 shows the indices generated in the three confirmatory factor analyses (CFA) with the QAES-R. The CFA1 resulted in four items with factor loadings below .40, and the CFA2 resulted in one item below 0.40. This result guided the exclusion of these items. We observed that the model obtained by CFA 3 containing 40 items distributed in five factors is qualified as adequate, as well as its reliability indices. The negative sign in the factor load of item 42 of the Career Planning factor indicates that, when accounting for it, its score should be reversed, since this is the only sentence of the factor with negative content. The reliability indices (ω total) were above .70 in all factors of the QAES-R.

Table 4

QAES-R: Factor Structure, Reliability, and Correlations between Factors

Items for Institutional Factor	CFA1	CFA2	CFA3
1. Remote classes meet my learning needs	.68	.70	.70
6. I identify with my University (e.g. values, rules)	.35	-	-
11. I have adapted to remote classes	.86	.88	.89
16. My professors are good at online classes	.56	.57	.58
21. I am well served at my university when I have bureaucratic, administrative, or access problems in remote classes	.51	.51	.52
22. I consider the proposals for adapting the practical disciplines to online classes to be adequate.	.57	.59	.59
26. I like the cultural activities promoted by my University during the period of isolation	.32	-	-
31. I know the operating rules of my University	.40	.39	-
36. I am satisfied with my University's students support areas (e.g. virtual library, online platform access tutorials, chats with teachers)	.57	.58	.58
Items for Social Factor			
2. Even if I have different points of view, I get along well with my classmates.	.47	.47	.47
7. Even while remote, I feel quite close to the group of friends I made at the University.	.56	.55	.55
12. I feel satisfied with the online interactions with friends at the University	.82	.83	.83
17. I feel integrated into the group of classmates who attend the same online classes as I do.	.55	.55	.56
27. Even while remote, I seek for the company of colleagues from the University during my leisure time	.23	-	-
32. Even while remote, I have a group of friends from the University that I can turn to whenever I need it.	.48	.46	.46
37. Even while remote, it is easy to establish good relationships with my classmates.	.70	.69	.70
Items for Study Factor			
3. I can take good notes in class	.49	.49	.49
8. I carry out academic activities on time	.41	.42	.42
13. I can identify the reasons why I do well or badly in online classes	.46	.48	.48
18. I plan my study activities on a daily basis	.49	.49	.49
23. I am able to focus on the study tasks as long as necessary	.72	.72	.72
28. After classes, I organize and systematize the information to study better	.44	.42	.42
33. I put effort in the study to achieve good results	.39	-	-
38. I do not give up on understanding the subject even when I find it difficult.	.48	.47	.47
41. The equipment I have at home is suitable for attending online classes	.47	.48	.48
43. The environment in my home is appropriate for attending the online classes	.54	.55	.55
45. I can attend online classes	.57	.57	.58
Items for Personal-emotional factor			
4. Recently, I have felt more more irritable than usual in the University.	.65	.65	.65
9. For the past few weeks I have been having thoughts about myself that made me sad.	.69	.70	.70
14. Lately I have been feeling disoriented and confused.	.76	.77	.77
19. In the past few weeks I have been feeling anxious.	.64	.65	.65
24. Lately, I have been feeling sad or downcast.	.75	.76	.76
29. Lately, I feel insecure about my abilities.	.45	.47	.47
34. Lately, there have been situations where I feel like I am losing control.	.70	.72	.72
39. In recent weeks, I have been feeling without energy and more tired.	.72	.72	.73
44. I feel that since the switch to remote classes I am in no mood	.75	.75	.76
Items for Career Planning Factor			
5. I am in the college course I have always dreamed of.	.52	.53	.54
10. I believe that I can fulfill myself professionally with the course I have chosen	.80	.81	.81
15. I feel like I am on a course that matches my interests and abilities.	.68	.69	.70
20. Even with the changes in the format of the classes, I think I am having a good preparation for the professional life I want in the future.	.78	.80	.80
25. I feel that with this course I will be able to achieve my goals	.81	.82	.82
30. I'm sure this is the best course for me	.82	.82	.82
35. Even with the switch to online classes, I would not change course	.63	.64	.64
40. I am sure of the importance that my course will have in my life in the future	.59	.59	.60
42. I am afraid that the current change in the format of classes will hinder my performance as a professional in the future.	.52	-.77	-.77

(continued...)

Table 4

Continuation

Plausibility of models				
CFA1	χ^2/gl = 2.93	RMSEA = .08 (90% CI .08 – .08)	CFI = .85	TLI = .84
CFA2	χ^2/gl = 3.02	RMSEA = .08 (90% CI .07 – .08)	CFI = .86	TLI = .85
CFA3	χ^2/gl = 3.12	RMSEA = .08 (90% CI .08 – .09)	CFI = .86	TLI = .85
Reliability Indices and correlations* between the factors of the CFA3 Model				
	Institutional	Social	Study	Personal- emotional	Career Planning
Institutional	ω total = .90				
Social	.60	ω total = .86			
Study	.67	.53	ω total = .85		
Personal-emotional	-.86	-.70	-.84	ω total = .93	
Career Planning	.54	.46	.63	-.57	ω total = .92

Note. Factor loadings < .40 are highlighted in bold; Value of the statistical significance of correlations: p < .001.

Table 4 also shows the values of the correlations between the QAES-R factors. The correlation between Social and Career Planning factors was moderate. The other correlations were large in magnitude. The Personal-Emotional factor was the only factor to present negative correlations between the other factors of the QAES-R. The items of this factor express the perception of mood swings, absence of self-control, self-confidence, and physical disposition, while in the other factors of the questionnaire—except for item 42—the sentences refer to situations of academic adaptation in remote teaching.

For the interpretation of the QAES-R it is assumed that high scores in the Institutional, Social, Study, and Career Planning factors indicate high academic adaptation of the student who went on to attend remote Higher Education. In contrast, students who score high in the Personal-Emotional factor demonstrate low academic adaptation in the ERT. The opposite is verified for the low score in this factor.

Discussion

The results of this research indicate that the 40-item model of the QAES-R, distributed in five factors (Table 4), presented the evidence of validity based on the internal structure. Additionally, adequate reliability estimates were identified.

The items excluded from the Institutional factor are indicative of less emphasis on the identification of students regarding the values and standards of the HEIs and the cultural activities offered with the implementation of the ERT. The focus of students on this dimension regarding adaptation to higher education was associated with the modifications made by the HEIs to transfer the content taught in the in-person modality to the virtual environment and the assistance offered to solve the problems arising from these changes (Amaral & Polydoro, 2020; Fossa et al., 2020; Soares et al., 2020).

The Social Factor prioritizes adaptation in the context of horizontal interpersonal relationships (between classmates). In ERT, HEIs need to favor the integration of students, especially newcomers students (Fior & Martins, 2020; Sanchez Jr. & Silva, 2020). The professors are also responsible for these actions, in the sense of managing the participation of students in classes by encouraging, for example, that they turn on the cameras in synchronous classes and that they communicate via chat (Soares et al., 2020).

The Study factor refers to the development of skills to deal with ICTs, strategies employed at the time of learning and the student's own self-regulation for this purpose. However, the ERT is linked to a series of factors that can interfere in this process, such as social, motivational conditions, among others, which imply the need for even greater adaptation by the student to deal with the adversities and specificities inherent to the context that presents itself (Fior & Martins, 2020; Rabaiolli & Hansen, 2020).

Personal-Emotional adaptation is also an important factor, since the consequences of the COVID-19 pandemic, including ERT, have affected students' mental health in different spheres. For this reason, the processes of self-knowledge and self-care became so relevant in order to further understand the aspects that bring physical and psychological exhaustion in the process of assisting in a more adequate management (Rabaiolli & Hansen, 2020; Sanchez Jr. & Silva, 2020). These activities can refer to routine organization, contact with loved ones, leisure activities, among others, as mentioned by Ambiel et al. (2020).

The Career Planning factor during the ERT reveals the need for the student to explore their career in different instances, that is, to reflect on their expectations while also seeking the necessary improvement to exercise their future profession. In this context, Ambiel et al. (2020), suggest research on the possible fields of activity, discussion with professionals in the area, theoretical deepening through courses and the elaboration of short, medium, and long-term strategies for the achievement of professional goals.

The magnitude of the values of the correlations between the factors of the QAES-R shows that, in the ERT, the dimensions are closely connected. This result diverges, in part, from the application of QAES in in-person teaching (Ilha et al., 2020). In Ilha et al. (2020), most of the correlations was found to have a moderate magnitude, targeting students graduating from a private Brazilian HEI.

Returning to remote teaching, it is conjectured that the measures promoted by the HEIs to enable this teaching modality – emphasis on the institutional dimension – are associated with the other dimensions of academic adaptation evaluated by the QAES-R and vice versa (Amaral & Polydoro, 2020; Ambiel et al., 2020; Soares et al., 2020). Thus, it is necessary to constantly evaluate the adaptation of students in order to monitor each of the dimensions, as indicated for in-person teaching (Araújo, 2017). In addition to the results found in the present research, the lack of adaptation in one dimension can affect the other academic dimensions (Ambiel et al., 2020; Fior & Martins, 2020; Soares et al., 2020).

As a limitation of the research, we recognize that, although the sample was composed of students from all Brazilian regions, students were mostly from the Southeast and South of the country (70.53%; n = 225), from private HEIs, and females. As for the model of adaptation to remote teaching, the expansion of the sample in quantitative terms will allow the application of other analyses to evaluate its internal structure. Therefore, we suggest testing the two-factor model in order to verify the plausibility of a structure containing a general factor and specific factors explaining the adaptation in remote teaching.

We plan to continue the studies with the QAES-R, with the intention of evaluating the effect of student's lack of resources, such as access to internet connection and to the necessary devices to follow the remote classes (e.g., notebooks, tablets). Moving past the COVID-19 pandemic, we believe that in-person teaching will have undergone profound transformations, which encompasses both the organization of HEIs in terms of academic regulations; professors, considering didactics; and students, in interpersonal relationships and study habits. Thus, the QAES-R will be used to evaluate these advances in teaching, as is the case of the implementation of hybrid teaching that, with the prolongation of the COVID-19 pandemic, is about to become a reality in many Brazilian HEIs. This is especially true in the private context in which the adequacy of curricula is observed in order to articulate in-person content with learning units carried out in a virtual environment.

Among the practical implications of this enterprise, professionals who work in the HEIs may use these resources to develop preventive and interventional measures by applying the dimensions of academic adaptation in remote teaching to the hybrid context; thus assisting in student's permanence and completion of higher education. Future studies may provide a revision of the items of the QAES-R, which are centered on the temporary change from in-person to remote teaching, considering that with the return of in-person classes, they may only partially reflect the academic context experienced by students when considering hybrid teaching. We suggest for this analysis to be performed especially in the Social Factor – items 7, 12, 17, 27, 32, and 37; Career Planning Factor – items 20, 35, and 42; and in the Institutional Factor – items 22 and 26 (see Table 4 to visualize the items mentioned).

References

Amaral, E. M., & Polydoro, S. A. J. (2020). Os desafios da mudança para o ensino remoto emergencial na graduação na Unicamp-Brasil [The challenges of switching to emergency remote teaching in undergraduate courses at Unicamp-Brazil]. *Linha Mestra*, (41A), 52-62. https://doi.org/10.34112/1980-9026a2020n41ap52-62

Ambiel, R. A. M., Santos, A. A. A., Soares, A. B., Lima, T. H., Barros, L. O., Inácio, A. L. M., Ferraz, A. S., Salvador, A. P., Martins, G. H., & Bathaus, J. K. O. B. (2020). *Adaptação e permanência no ensino superior em tempos de pandemia* [Adaptation and permanence in collegue education in times of pandemic]. Força Tarefa PsicoVida: Conhecimento Científico a Favor do Bem-Estar. https://doi.org/10.13140/RG.2.2.32401.86886

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing.* AERA.

Appenzeller, S., Menezes, F. H., Santos, G. G., Padilha, R. F., Graça, H. S., & Bragança, J. F. (2020). Novos tempos, novos desafios: Estratégias para equidade de acesso ao ensino remoto emergencial [New times, new challenges: Strategies for equal access to emergency remote teaching]. *Revista Brasileira de Educação Médica, 44*(Suppl 1), 1-6. https://doi.org/10.1590/1981-5271v44.supl.1-20200420

Araújo, A. M. (2017). Sucesso no ensino superior: Uma revisão e conceptualização [Success in collegue education: A review and conceptualization]. *Revista de Estudios e Investigación en Psicología y Educación, 4*(2), 132-141. https://doi.org/10.17979/reipe.2017.4.2.3207

Cassepp-Borges, V., Balbinotti, M. A., & Teodoro, M. L. (2009). Tradução e validação de conteúdo: Uma proposta para a adaptação de instrumentos [Translation and content validation: A proposal for the adaptation of instruments]. In L. Pasquali (Org.), *Instrumentação psicológica: Fundamentos e práticas* [Psychological instrumentation: Fundamentals and practices] (pp. 506-520). Artmed.

Correia, M. S., Araújo, N. A., & Marques, B. G. (2020). A ausência do diálogo no processo de formação profissional em saúde no ensino remoto: Impactos na aprendizagem e na saúde mental de acadêmicos [The absence of dialogue in the process of professional training in health in remote teaching: Impacts on learning and mental health of academics]. *Temas em Educação e Saúde, 16*(2), 648-663. https://doi.org/10.26673/tes.v16i2.14403

Dunn, T. J., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology, 105*(3), 399-412. https://doi.org/10.1111/bjop.12046

Fior, C. A., & Martins, M. J. (2020). A docência universitária no contexto de pandemia e o ingresso no ensino superior [University teaching in the context of a pandemic and entry into collegue education]. *Revista Docência do Ensino Superior, 10*, 1-20. https://doi.org/10.35699/2237-5864.2020.24742

Fossa, R. S., Benedetti, A. C., Esteves, P. E. C. C., & Silva, R. H. A. (2020). Ensino remoto emergencial em um curso de medicina: Avaliação do trabalho docente na perspectiva discente [Emergency remote teaching in a medical course: Evaluation of teaching work from the student perspective]. *Revista Docência do Ensino Superior, 10*, 1-21. https://doi.org/10.35699/2237-5864.2020.24654

Gehlbach, H., & Barge, S. (2012). Anchoring and adjusting in questionnaire responses. *Basic and Applied Social Psychology, 34*(5), 417-433. https://doi.org/10.1080/01973533.2012.711691

Goss-Sampson, M. (2020). *Statistical analysis in JASP: A guide for students.* https://doi.org/10.6084/m9.figshare.9980744

Ilha, V. D., Santos, A. A. A., & Queluz, F. N. F. R. (2020). Propriedades psicométricas do Questionário de Adaptação ao Ensino Superior (QAES) em estudantes universitários finalistas [Psychometric properties of the Higher Education Adaptation Questionnaire (QAES) in finalist undergraduates]. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica, 4*(57), 41-51. https://doi.org/10.21865/RIDEP57.4.03

International Test Comission. (2017). *Diretrizes do ITC para tradução e adaptação de testes* [ITC guidelines for test translation and adaptation]. Instituto Brasileiro de Avaliação Psicológica. https://www.ibapnet.org.br/docs/Brazilian_translation_ITC_guidelines_for_translating_and_adapting_tests.pdf

Matta, C. M. B., Lebrão, S. M. G., & Heleno, M. G. V. (2017). Adaptação, rendimento, evasão e vivências acadêmicas no ensino superior: Revisão da literatura [Adaptation, performance, evasion and academic experiences in higher education: Literature review]. *Psicologia Escolar e Educacional, 21*(3), 583-591. https://doi.org/10.1590/2175-353920170213111118

Marôco, J. (2014). *Análise de equações estruturais: Fundamentos teóricos, software & aplicações* [Structural equation analysis: Theoretical foundations, software & applications]. ReportNumber.

Ministério da Educação. (2020). Portaria No. 343, de 17 de março de 2020 [Ordinance No. 343, of March 17, 2020]. Dispõe sobre a substituição das aulas presenciais por aulas em meios digitais enquanto durar a situação de pandemia do Novo Coronavírus - COVID-19 [Provides for the replacement of face-to-face classes with classes in digital media while the pandemic situation of the New Coronavirus - COVID-19 lasts]. *Diário Oficial da União, seção 1.* http://www.in.gov.br/en/web/dou/-/portaria-n-343-de-17-de-marco-de-2020-248564376

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide: Statistical analysis with latent variables* (7th ed.). Authors.

Rabaiolli, J., & Hansen, F. (2020). Experiências em ensino remoto de publicidade e propaganda na pandemia da Covid-19 [Experiences in remote teaching of advertising and propaganda in the Covid-19 pandemic]. *Comunicação & Educação, 25*(2), 169-183. https://doi.org/10.11606/issn.2316-9125.v25i2p169-183

Rondini, C. A., Pedro, K. M., & Duarte, C. S. (2020). Pandemia do COVID-19 e o ensino remoto emergencial: Mudanças na práxis docente [COVID-19 pandemic and emergency remote teaching: Changes in teaching practice]. *Interfaces Científicas - Educação, 10*(1), 41-57. https://doi.org/10.17564/2316-3828.2020v10n1p41-57

Sanchez Júnior, S. L., & Silva, M. C. (2020). Impactos do ensino remoto na vida acadêmica de estudantes da educação superior: Revisão de conceitos da Educação a Distância e o modelo de ensino remoto [Impacts of remote learning on the academic life of higher education students: Review of Distance Education concepts and the remote learning model]. *Revista de Ciências Humanas, 20*(2), 73-92. https://periodicos.ufv.br/RCH/article/view/11654/6351

Soares, T. L. F. S., Santana, I. S., & Comper, M. L. C. (2020). Ensino remoto na pandemia de COVID-19: Lições aprendidas em um projeto de extensão universitário [Remote teaching in the COVID-19 pandemic: Lessons learned in a university extension project]. *Dialogia,* (36), 35-48. https://doi.org/10.5585/dialogia.n36.18396

Teixeira, M. O., & Costa, C. J. (2017). Carreira e bem-estar subjetivo no ensino superior: Determinantes pessoais e situacionais [Career and subjective well-being in higher education: Personal and situational determinants]. *Revista Brasileira de Orientação Profissional, 18*(1), 19-29. http://dx.doi.org/10.26707/1984-7270/2017v18n1p19

Adriana Satico Ferraz is a Professor of the Centro Universitário de Brasília, Brasília-DF, Brazil.

Amanda Lays Monteiro Inácio is a Professor of the Universidade Estadual Paulista, Assis-SP, Brazil.

Jennifer Kerolly de Oliveira Barros Bathaus is a Master's degree of the Universidade São Francisco, Campinas-SP, Brazil.

Acácia Aparecida Angeli dos Santos is a Professor of the Universidade São Francisco, Campinas-SP, Brazil.