# Adaptation and workload as predictors of professional self-efficacy in Peruvian university teachers during the COVID-19 pandemic

**Maria Elizabeth Minaya-Herrera[1,2], Gabriela Requena Cabral[1,3], Oscar Mamani-Benito[4], Edison Effer Apaza Tarqui[5], Manuel Landa-Barzola[6]**

[1] Escuela de Posgrado, Universidad Peruana Unión. Lima
[2] Facultad de Ciencias Humanas y Educación, Escuela Profesional de Educación, Universidad Peruana Unión. Juliaca
[3] Facultad de Ciencias Humanas y Educación, Universidad Peruana Unión. Lima
[4] Escuela Profesional de Psicología, Universidad Peruana Unión. Juliaca
[5] Dirección de Gestión de Calidad y Acreditación, Universidad Norbert Wiener. Lima
[6] Escuela Profesional de Psicologia, Universidad César Vallejo. Lima

**Peru**

*Correspondence: Oscar Javier Mamani Benito*. Carretera a Arequipa km 06, Chullunquiani, Juliaca, Perú. E-mail: oscar.mb@upeu.edu.pe

# Abstract

**Introduction.** University teachers have had to face the changes required by online education in times of the COVID-19 pandemic. The aim of the present research was to determine whether workload and adaptation to online classes predict professional self-efficacy in university teachers.

**Method.** A total of 321 university teachers (55.5% male, 44.5% female) from two Peruvian universities (22.4% from state universities, 77.6% private), ages 22 to 66 years, were selected through non-probabilistic, purposive sampling for this associative-predictive study. The evaluation consisted of applying three instruments: a scale on adaptation to online classes, a workload scale and a professional self-efficacy questionnaire. A structural equation model was calculated using SPSS Amos 22.0 statistical software.

**Results.** Correlation analysis showed significant associations between the study variables ($p < .05$). Goodness-of-fit indicators for the SEM model were very good ($\chi^2 = 380.68$, with 143 $df$, and a $p$ value $< .001$, $CFI = .956$ $IFI = .957$; $NFI = .932$; $GFI = .891$; $TLI = .948$; $RMSEA = .072$). A statistically significant effect of adaptation and workload on professional self-efficacy was thus determined.

**Discussion and conclusions.** The level of adjustment to online teaching and the perception of excessive workload are factors that influence university teachers' confidence in their teaching abilities. We conclude that online adaptation and workload predict professional self-efficacy in Peruvian university teachers.

**Key words:** adaptation, professional self-efficacy, workload, online classes, Peru.

# Resumen

**Introducción.** Los docentes universitarios han tenido que enfrentar los cambios que demanda la educación virtual en tiempos de pandemia COVID-19. Por ello, se tuvo el objetivo de determinar si la adaptación a los medios académicos virtuales y carga laboral predicen la autoeficacia profesional en docentes universitarios.

**Método.** Estudio asociativo-predictivo, donde participaron 321 docentes universitarios (55.5% varones y 44.5% mujeres) de dos universidades peruanas (22.4% estatal y 77.6% privada), de entre 26 a 66 años de edad, seleccionados bajo un muestreo no probabilistico intencional. La evaluación se realizó mediante una escala de adaptación a los medios academicos virtuales, una escala de carga laboral y un cuestionario de autoeficacia profesional. Se estimo un modelo de ecuaciones estructurales utilizando el software estadistico SPSS Amos 22.0.

**Resultados.** El analisis de correlación evidencia asociaciones significativas entre las variables de estudio ($p < .05$). Para el modelo SEM, los indicadores de bondad de ajuste fueron muy buenos ($\chi^2 = 380.68$, con 143 $gl$, y un $p$ valor $< .001$, *CFI* = .956 *IFI*= .957; *NFI*= .932; *GFI*= .891; *TLI* = .948; *RMSEA*= .072). De esta manera, es posible determinar que existe un efecto estadísticamente significativo de la adaptación y la carga laboral sobre la autoeficacia profesional.

**Discusión y conclusiones.** El nivel de ajuste para la enseñanza virtual y la percepción de sobrecarga de trabajo son factores que influyen en la confianza que tienen los docentes universitarios sobre sus capacidades pedagogicas. Se concluye que la adaptación y la carga laboral predicen la autoeficacia profesional en docentes universitarios peruanos.

**Palabras Clave:** adaptación, autoeficacia profesional, carga laboral, clases virtuales, Perú.

## Introduction

In all parts of the world, the economic, political, social and educational situation is of much concern to society; in each sector, countries have tried to dictate measures to deal with the consequences of the COVID-19 pandemic. In recent times, schools and universities around the world have closed their doors, affecting about 1.57 billion students in 191 countries (Peñafiel, 2020). The pandemic context has thus directly affected the educational systems of all Latin American countries, affecting students, households, ministries, secretariats, schools, teachers and administrators (Álvarez et al., 2020).

The situation is serious and reveals that several educational systems lack effective mechanisms for distance education in accordance with the characteristics of households, clearly widening the gap already present between students with greater or fewer socioeconomic resources.

Despite the difficulties encountered, universities have historically had to face this type of situation, opting to continue with the teaching-learning process even behind closed doors (Giannini, 2020). The Latin American region, where there were already problems of educational quality and inclusion, has had to deal with this and other larger and long-standing problems, from poor Internet connection to teachers who were not prepared to take on the challenge of online education (Peñafiel, 2020). Moreover, the temporary closure affected approximately 23.4 million higher education students and 1.4 million teachers in Latin America and the Caribbean; this represents more than 98% of the population of higher education students and teachers (Giannini, 2020).

According to Díaz-Lazo (2020), the COVID-19 pandemic brought about great changes and prompted the application of new distance education strategies, leading to new teacher competencies and innovations for carrying forward the teaching and learning process in online environments: the use of various platforms (Zoom, Meet, Blackboard, Google Classroom, etc.) as well as new assessment and feedback instruments, and suitable materials for implementing practical sessions, such as videos or other digital media. All this leads to reflection on how Peruvian teachers have had to adapt to the new educational scenario, handle the new workload, and, above all, develop self-efficacy for online classes.

Adaptation, as a construct, is defined as a process of accommodation and adjustment to new circumstances (González-Contreras et al., 2019). In the educational field, it is the accommodation and balance achieved between the teacher's motivations and aptitudes, and the demands of administration over the teaching-learning process. The adjustment process will therefore depend on certain aspects such as workload, satisfaction with the educational administration, perceived value given to their work, their relationship with colleagues, the institutional climate, and so on (Al-Mahrooqi, Deman, & Ahemed, 2015). As for workload, this involves the set of demands that a worker must meet as part of the professional activities in their workday (Tynan, Ryan, & Mills, 2015). In the field of higher education, these demands involve physical, mental, and emotional aspects (Miller, 2019). Finally, self-efficacy is defined as confidence in one's own ability to achieve the expected results; it is a determining factor in the way people think, feel, motivate themselves, and behave. In this sense, people can not only influence their environment but also modify it (Meseguer, Soler, & García-Izquierdo, 2014). In the context of university teaching, it refers to the university professor's beliefs about their capability for carrying out the teaching-learning process (Bustamante et al., 2017; Del Rio et al., 2018; Ramakrishnan & Mohamad, 2019).

Regarding the connection between these variables, the scientific literature shows evidence of functional relationships between them; for example, Hernandez and Ceniceros (2018) found a positive correlation between teacher self-efficacy and teacher performance in in a Mexican study of the two variables. Cezar-Vaz et al. (2016), in Brazil, conducted an investigation on teacher workload, finding a high prevalence of excessive workload, where the biggest contributers to a higher load were the professional category, and the work shift, while the age factor was associated with a lesser load. In the same line, Calderón-De la Cruz, Merino and Juárez (2018), in Peru, conducted a validation study of the *Escala de Carga de Trabajo*, or Workload Scale, finding a unidimensional factor structure and metric equivalence of the items between men and women; reliability was acceptable, and intensity of the workload varied slightly according to the worker's type of labor contract. On the other hand, it is also important to highlight the existence of theoretical models that can integrate our study variables, such as the modulating effects model (Jex & Bliese, 1999), which proposes that the effect of work overload in professionals who are subject to stressors is regulated by their level of self-efficacy, which decreases their likelihood of encountering burnout, adaptation issues to new environments, or academic challenges (Gil-Monte et al., 2008).

In short, professional self-efficacy in university teachers is an indispensable, decisive variable for the success of the teaching-learning process at university. This has a direct influence on student variables such as academic achievement, study motivation, and academic satisfaction (Perera & John, 2020), and hence on the quality of university education (Lozano-Paz & Reyes-Bossio, 2017). However, given the impact of the pandemic on higher education and the obvious shortcomings of the Peruvian educational system, the authors of this research study consider it important to examine how well teachers of higher education are adapting to teaching class over virtual platforms, and to evaluate their workload, which in many cases has even had to increase due to the precarious labor and economic situation resulting from necessary layoffs at Peruvian universities.

### *Objectives and hypotheses*

Based on the foregoing, the level of adjustment to online teaching and the perception of excessive workload are factors that influence university teachers' confidence in their teaching abilities. The present research aim, therefore, is to determine whether adaptation to online academic environments and workload are predictors of professional self-efficacy in Peruvian university teachers.

## Method

### *Participants*

The participants, selected through non-probabilistic, purposive sampling, were 321 teachers, as described in Table 1: 55.5% male and 44.5% female, from Peruvian universities (22.4% state and 77.6% private), between 26 and 66 years of age. The home residence of these subjects was distributed between the coast (45.8%), highlands (37.1%) and jungle of Peru (17.1%). Most hold a full-time contract (71.3%) and 41.4% have worked more than 10 years in university teaching. In addition, 51.7% have a master's degree, 33.9% have a doctorate degree and 14.3% still have a bachelor's degree. They are attached to the faculties of business sciences (35.8%), engineering (23.7%), education (19.3%), health sciences (15.6%) and theology (5.6%).

Table 1. *Characteristics of the participants (n=321)*

| Variable | Category | f | % |
|---|---|---|---|
| Sex | Male | 178 | 55.5 |
| | Female | 143 | 44.5 |
| Age | 26 to 36 years | 89 | 27.7 |
| | 37 to 47 years | 112 | 34.9 |
| | 48 to 58 years | 80 | 24.9 |
| | 59 to 66 years | 40 | 12.5 |
| Home residence | Coastal | 147 | 45.8 |
| | Highlands | 119 | 37.1 |
| | Jungle | 55 | 17.1 |
| University | Private | 249 | 77.6 |
| | State | 72 | 22.4 |
| Type of contract | Full Time | 229 | 71.3 |
| | Part Time | 92 | 28.7 |
| Length of service | 0 to 3 years | 74 | 23.1 |
| | 4 to 6 years | 43 | 13.4 |
| | 7 to 10 years | 71 | 22.1 |
| | over 10 years | 133 | 41.4 |
| Highest degree | Bachelor's | 46 | 14.3 |
| | Master's | 166 | 51.7 |
| | Doctorate | 109 | 33.9 |
| Faculty | Engineering | 76 | 23.7 |
| | Business | 115 | 35.8 |
| | Education | 62 | 19.3 |
| | Health | 50 | 15.6 |
| | Theology | 18 | 5.6 |

Note. f = Frequency, % = Percentage, n = Sample

*Instruments*

*Autoeficacia profesional* (AU-10), a professional self-efficacy scale (Calderón-De la Cruz, Dominguez-Lara & Arroyo-Rodriguez, 2018). The instrument contains 10 items distributed in a single factor. The items are scaled in a Likert format, with seven response options: never (1), seldom (2), at times (3), somewhat (4), many times (5), most of the time (6), always (7). Content validity was established by the judgment of seven experts who evaluated for clarity, representativeness and relevance of the items (Aiken's $V$ = .84); in addition, reliability of the AU-10 in the present study was $\alpha$ = .96 (CI 95%: .95 - .96).

*Adaptación a los medios academicos virtuales* (AMAV), or Adaptation to online academic environments, an adaptation of the *Cuestionario de adaptación a la vida universitaria*, adaptation to university life questionnaire (CAVU; Rodriguez-Ayan & Sotelo, 2014). Its 11 items are distributed in three dimensions: social, academic and institutional. The items are scaled in a Likert format, with five responons: strongly disagree (1), agree (2), neither agree nor disagree (3), agree (4) and strongly agree (5). Regarding its psychometric properties, after content validation by the judgment of seven experts (Aiken's $V$ = .89), a confirmatory factor analysis was performed based on a pilot test, yielding satisfactory goodness-of-fit indices ($X^2$= 24.204, *df*=13; *p*= .001; *RMR*= .058; *CFI*= .908; *GFI*= .957; *AGFI*= .931 and *RMSEA*= .071); interfactor correlation was significant (p<.05) and reliability was good ($\alpha$= .91; *CI* 95%= .70 - .77).

*Carga laboral* (ECT), a workload scale (Calderón, Merino-Soto, Juarez & Jimenez-Clavijo, 2018). The instrument contains six items distributed in a single factor. This Likert-type scale has five response options, where 0 is never and 6 is very frequently. Content validity was established through the judgment of seven experts who evaluated for clarity, representativeness and relevance of the items (Aiken's $V$ = .95); in addition, the reliability of the ECT in the present study was $\alpha$ = .85 (CI 95%: .89 - .94).

*Procedure*

Taking into account the state of emergency due to the pandemic, the questionnaires were designed in digital format (Google forms) and shared through the universities' online academic platform and the WhatsApp social network. The questionnaires were enabled during the months of November and December 2020. Within a time limit of 20 minutes, the participants responded to items such as "I am able to manage my courses through online platforms" (self-efficacy), "When you are working, do you encounter particularly difficult situations?"x (workload), "I have managed to adapt to the use of online academic platforms made available at the university where I work". The form began by presenting the study objective and then the informed consent, emphasizing the anonymous and voluntary nature of participation. The procedures developed followed the indications of the Helsinki Declaration; finally, this research study had the approval of the Ethics Committee of the Peruvian Union University.

*Design*

According to the classification by Ato, López and Benavente (2003), the present study follows an associative-predictive research design.

*Data analyses*

Before proceeding with the analyses, we checked for fulfillment of assumptions. For the multiple linear regression, independence of errors was analyzed, obtaining a Durbin Watson coefficient of 1.959 (within the acceptable range 1.5-2.5); similarly, noncollinearity was demonstrated with tolerance values greater than .10 (.965) and IVF less than 10 in all cases (1.03). Finally, the assumption of normality for Pearson's *r* correlation analysis was met, with a p-value greater than .05 in all cases (adaptation=.067; workload=.089; self-efficacy=.156).

In order to obtain the final model and the appropriate goodness-of-fit indexes, some indicators were eliminated: in the latent factor Adaptation, indicators AD1 and AD9 through AD11 were eliminated, a total of 4 indicators. In the latent factor Workload, two indicators, CL1 and CL6, were eliminated. Finally, in the latent factor Self-efficacy, two indicators were eliminated: AU1 and AU2. Model fit was evaluated with Chi square ($\chi^2$), which is very sensitive to large sample sizes. For this reason, global evaluation of the model was performed considering goodness-of-fit indicators, whose values range from 0 to 1, where high values suggest greater variance explained by the model. The "Comparative Fit index" (CFI), "Tucker Lewis Index" (TLI) and CFI greater than .95, and TLI greater than .90, are indicators of a good fit; finally, the "Root Mean Square Error of Approximation (RMSEA), where values less than .08 are considered acceptable.

## Results

In Table 2 we observe that 47.4% of the participants perceived their adaptation as medium, while 21.8% perceive a high level of adaptation. Likewise, 43.9% of the respondents perceived a medium level of workload, while 25.5% perceived a high level. Finally, 42.1% of the participants perceived a medium level of self-efficacy, while 27.7% perceived their level of self-efficacy to be high.

Table 2. *Frequencies and percentages of the study variables*

| Variable | Level | | |
|---|---|---|---|
| | Low | Medium | High |
| Adaptation | 99 (30.8%) | 152 (47.4%) | 70 (21.8%) |
| Workload | 98 (30.5%) | 141 (43.9%) | 82 (25.5%) |
| Professional self-efficacy | 97 (30.2%) | 135 (42.1%) | 89 (27.7%) |

In the comparison of means, there were no significant differences in adaptation or self-efficacy between men and women ($t = -.195$, $p = .845$; $t = -.780$ $p = .436$). On the other hand, when comparing workload, significant differences were found ($t = 2.402$, $p = .02$). Likewise, effect size was calculated using Cohen's $d$; effect size of the workload variable is not inconsiderable ($d = .39$).

Table 3. *Difference between men and women with respect to self-efficacy, adaptation and workload.*

| | Men | | Women | | t | p | d |
|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | | | |
| Adaptation | 35.43 | 6.675 | 35.58 | 7.255 | -.195 | .845 | .023 |
| Workload | 8.65 | 3.280 | 9.85 | 2.846 | -3.69 | .000 | .391 |
| Professional self-efficacy | 34.54 | 6.886 | 35.12 | 6.969 | -.780 | .436 | -.069 |

Results of the correlation analysis are presented in Table 4. The relations found were inverse between workload and adaptation ($r = -.188$), and direct between self-efficacy and adaptation ($r = .263$); however, no correlation was found between self-efficacy and workload ($r = .097$).

Table 4. *Correlation between adaptation to online academic environments, workload and professional self-efficacy*

| Variables | 1 | 2 | 3 |
|---|---|---|---|
| 1 | - | - | - |
| 2 | -.188** | - | - |
| 3 | .264** | .097 | - |

Note. 1 = Adaptation to online academic environments, 2 = Workload, 3 = Self-efficacy

In the model presented in Figure 1, one can identify a direct effect of the latent factor adaptation on self-efficacy ($\beta = .25$; p < .01); likewise, workload also has a direct effect on the latent factor adaptation ($\beta = 0.12$; p < .05), the former being highly significant. Along these lines, the relationship between adaptation and workload ($r = -.18$; $p < .05$) was negative, inverse and significant, indicating that there is inverse proportionality between these latent variables. Goodness-of-fit indicators of the global model were very good ($\chi^2 = 380.68$, with 143 df, and a *p-value < .001, CFI = .956; IFI= .957; NFI=.932; GFI=.891; TLI= .948; RMSEA= .072*). Therefore, based on these indicators, a statistically significant effect of adaptation and workload on professional self-efficacy can be established.
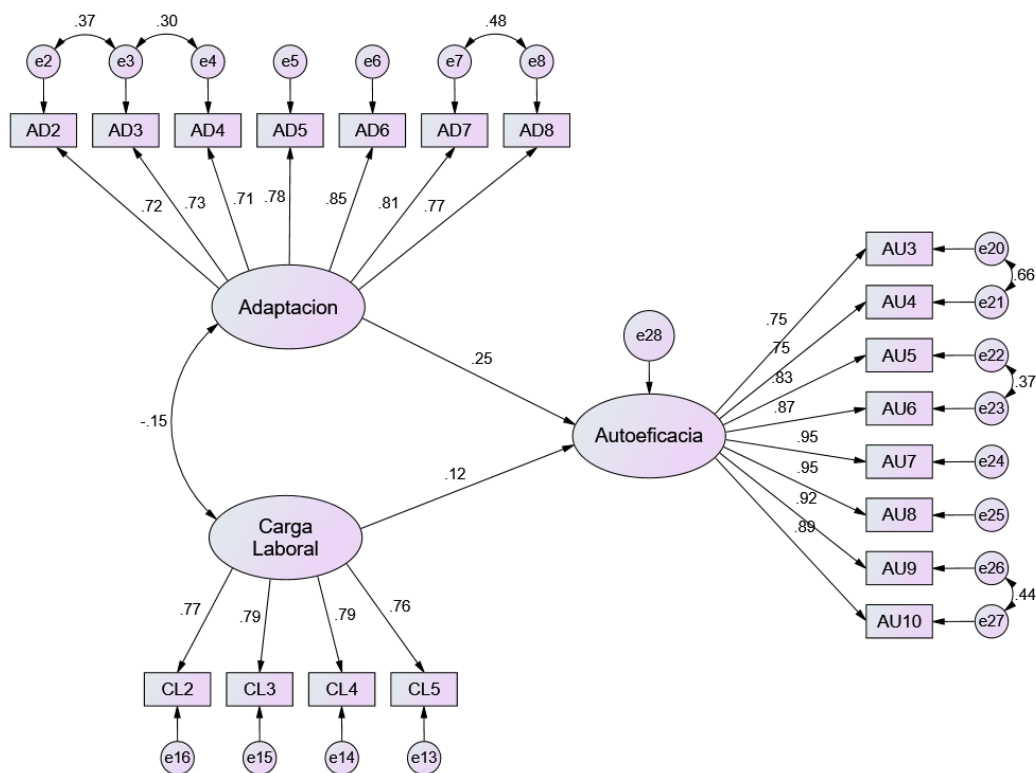


Figure 1. *SEM model to explain professional self-efficacy based on adaptation to online academic environments and workload.* [*Adaptación*: Adaptation. *Autoeficacia*: Self-efficacy. *Carga Laboral*: Workload.]


## Discussion and Conclusions


The quarantine and later total closure of schools around the world has brought consequences and challenges throughout the educational system, including the methodological challenge of adapting to online learning (König et al., 2020). It is still unknown to what extent teachers have managed to adapt to this context, which is subject to constant change. The aim

of this research, therefore, was to determine whether adaptation to online academic environments and workload are predictors of professional self-efficacy in Peruvian university teachers.

Using a database from the three regions of Peru, the SEM model was confirmed, finding that workload and adaptation to online academic environments significantly predicted professional self-efficacy, in similar fashion to previous studies (Cezar-Vaz et al., 2016; Hernández & Ceniceros, 2018). A large percentage of teachers reported an adaptation of 47.6% (See Table 2), thus promoting a positive increase in their self-efficacy and in the introduction of novel online teaching methodologies.

These results therefore document the predictive value of adaptation to online environments, which is a process of accommodation and adjustment to new circumstances (González-Contreras et al., 2019); given its impact on teacher confidence and teachers' actual ability to achieve the expected results, adaptation is perceived to be a hallmark of quality teaching (König et al., 2020). Thus, it is likely that the approximate 69.2% whose adaptation was between medium and high had greater attitudinal resources to carry out quality online education, even before the school closures began.

However, adapting is not enough, teachers must constantly analyze and assess students' needs and address them in the short and long term; moreover, to the extent that effectiveness is attained in the online teaching and learning process, students' confidence in their abilities will increase (Cardoso et al., 2020), thereby decreasing the inequality gaps (Sun et al., 2016).

On the other hand, workload is an important predictive aspect in teacher self-efficacy, as reflected in other research (Cheung et al., 2020; Guidetti et al., 2018; Klassen & Chiu, 2010). Workload influences perceived self-efficacy; stress due to workload accumulation affects the teacher's confidence with regard to their teaching strategies (Cheung et al., 2020; Klassen & Chiu, 2010).

Proportionately to these results, adaptation to online academic environments and workload provide good practices for virtualized learning (Armstrong-Mensah et al., 2020). However, face-to-face learning continues to be the mandatory environment for the logistical,

methodological and experiential structuring of structured learning (Rapanta et al., 2020). In summary, the pandemic context produced by COVID-19 is not the most appropriate context for the training of professionals: the relevant techniques, skills and knowledge are not adequately transmitted, no matter how many logistical attempts may be made to do so (Espino-Díaz et al., 2020).

The data obtained in this study undoubtedly shine a spotlight on teacher beliefs about their own abilities to face specific situations such as the teaching-learning process in online contexts. It is important to consider that teachers who are confident in their instructional effectiveness create mastery experiences for their students, while those with low confidence can generate negative environments for learning (Rio de la Paz, 2018). Therefore, the core findings of the present study can guide educational administrators to address the issue of work overload, to promote teachers' ability to adjust to the current context, and to further educational reform that allows teachers to adapt their traditional teaching strategies to online education.

In light of the previous analysis, we would note the emerging lines of future research oriented to the study of online learning, distance learning strategies, online distance learning platforms, strategies for emotional support to teachers, among others.

Finally, the present study is not free of limitations, the first of which stems from its exclusively Peruvian population. The data cannot be broadly generalized: while the situation of social isolation is the same, educational policies are different for each Latin American country. Secondly, the psychometric calibration of the instruments led to covariations in the errors, in order to achieve an adequate model; however, this could have been avoided if there had been further exploratory analyses of the instruments.

In summary, based on the empirical and theoretical results, it is concluded that adaptation and workload directly predict self-efficacy in Peruvian university teachers.

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