

# Predictors in the satisfaction of managing virtual resources: the role of the learner

## Predictores en la satisfacción de gestionar recursos virtuales: el papel del aprendiz

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### ABSTRACT

#### Keywords

Student satisfaction; online learning; educational quality management; university students; factor analysis

With the spread of SARS-CoV-2, all universities were forced to implement the virtual modality in their curricula so as not to paralyze the educational system. Likewise, the Universidad Nacional Mayor de San Marcos, located in the city of Lima, Peru, continued with non-face-to-face classes through virtual resources to help its students in the learning process. Therefore, this research aimed to determine the factors of the student role that influenced the satisfaction of managing virtual resources. The study procedure included the collection of 184 surveys through Google Forms and the analysis of validity, structural model, reliability and hypothesis tests using the non-parametric Spearman's Rho test. Some of the limitations of the analysis were due to generational differences and socioeconomic and geographic variables of the participants. This paper found, according to the order of the highest score of the correlation coefficient, that the factors student-content interaction, gamified participation, motivation, self-efficacy in internet and computing, and perceived usefulness predicted the satisfaction of managing virtual resources in students. It was concluded that the five independent variables were significantly correlated in the dependent variable.

### RESUMEN

#### Palabras clave

Satisfacción estudiantil; aprendizaje en línea; gestión de la calidad educativa; estudiantes universitarios; análisis factorial

Con la propagación del virus SARS-CoV-2 todas las universidades se vieron obligadas a implementar la modalidad virtual en sus planes de estudio para no paralizar el sistema educativo. Ante la contingencia, la Universidad Nacional Mayor de San Marcos, localizada en la ciudad de Lima, Perú, continuó con clases no presenciales por medio de recursos virtuales para que los estudiantes siguieran con su proceso de aprendizaje. La presente investigación tuvo como objetivo determinar los factores del rol estudiantil que influyeron en la satisfacción de gestionar recursos virtuales. El procedimiento de estudio incluyó la recopilación de 184 encuestas a través de Formularios de Google y el análisis de pruebas de validez, modelo estructural, confiabilidad e hipótesis utilizando la prueba no paramétrica de Rho de Spearman. Algunas de las limitaciones del trabajo se dieron por las diferencias generacionales y las variables socioeconómicas y geográficas de los participantes. Según el orden de mayor puntuación del coeficiente de correlación, se encontró que los factores interacción estudiante-contenido, participación gamificada, motivación, autoeficacia en internet e informática y utilidad percibida, predijeron la satisfacción de gestionar recursos virtuales en estudiantes. Se concluye que las cinco variables independientes se correlacionaron significativamente en la variable dependiente.

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## INTRODUCTION

Since the beginning of 2000, education has faced a great challenge: to respond to the new paradigms posed by the knowledge society and the digital era. Traditional educational models are overwhelmed by the continuous changes in which the learning process is inevitably immersed; in response to this, connectivism is born, a learning theory for the digital era that can be applied as a pedagogical model. In this sense, connectivism as a model for the new society mediated by technology has the following characteristics: it prioritizes decision making and constant updating, it is presented with the formation of networks that connect sources of information or specialized nodes, it resides in connections, it can inhabit non-human devices and learning occurs with the mediation of technology (Siemens, 2006).

Siemens (2006), the father of connectivism, has stated: "When knowledge stops existing in physical space, we can duplicate (or connect) entities in multiple spaces. Knowledge, when digital [...] can be combined (or remixed) readily with new knowledge" (p. 73). In this sense, distance education is gaining ground over conventional educational forms, since it allows learning through the use of social networks, through learning groups housed in digital media (García, 2017), and it has been improving to become a beneficial mode for students disadvantaged by issues such as space and time when studying.

Within the framework of higher education, in the last three years, research measuring student satisfaction in online programs has been developed with special interest in order to determine which factors predict learner satisfaction. This concern emphasizes not only the benefit that university management can obtain from this evaluation, but also the professional, personal and social benefit that it brings to learners of online courses (DíazCamacho et al., 2021).

In this sense, it is important to mention that there are several conditioning factors for satisfaction in virtual education, so it is necessary to pay particular attention to the role of university management, the influence of connectivity and technology, the development of online courses, the role played by the teacher and, above all, the student role. The latter will be the main interest of our study, since current research has shown that when the focus is on this element, high levels of satisfaction are achieved.

On the other hand, following the covid-19 pandemic, all higher education institutions worldwide had to close their doors to contain the spread of the disease. This has led to having their face-to-face programs adapted to virtual modes so that student learning would not stop (United Nations, 2020). In this regard, the Universidad Nacional Mayor de San Marcos (UNMSM, y its acronym in Spanish), in Lima, Peru, has gradually implemented the non-face-to-face mode using virtual educational

resources (such as Google Classroom and Google Meet) in all its faculties and schools at the undergraduate and graduate levels. For UNMSM, which has accompanied its teachers and students in this process, evaluating the satisfaction levels of its participants is important to improve the educational quality of the university in times of confinement.

In order to explore the satisfaction of managing virtual resources, this article determines which student predictors influence the satisfaction of UNMSM students. We begin with a sample of the research background, followed by the state of the art and the analysis of the study methods, and ends with the research findings and conclusions.

## THE ROLE OF THE ONLINE STUDENT

At the time of developing the educational process, learners in the virtual mode must play roles that allow them to achieve positive results in their learning. For this reason, scientific evidence shows that studies that have been concerned with working on the role that students assume at the time of learning have achieved better levels of satisfaction of their participants (Díaz-Camacho et al., 2021; Ghassan Al Azmeh, 2019; Landrum, 2020).

Digital native learners have a significant role in online learning, they like data in an agile and immediate way, they are self-efficient when making use of the network, they prefer content with multitasking, parallel processes and graphics, they like learning in a gamified way and they perceive a useful progress for them, providing them with motivation during the learning process (Prensky, 2001). In that sense, student interaction with the content, motivation, computer self-efficacy and internet skills, as well as perceived usefulness and gamified linkage of students can be considered as predictors in their satisfaction and success in online educational programs.

In digitally mediated learning spaces, students' self-confidence in the use of electronic devices and the network plays a relevant role in the achievement of learning (Herrador *et al.*, 2019). Similarly, it is important that participants feel capable of solving the problems that arise when using technologies, such as the threat of a computer virus affecting the software of the electronic device, slowness or system saturation, etc. (Bayrak *et al.*, 2020). This security, in itself, is a factor of the student role that favors their participation in a virtual course, while contributing to a favorable experience in distance learning (Baber, 2020; Wolverton *et al.*, 2020).

Another elemental factor in the role of the online learner is the student-content interaction. Learners in a course need to relate to the subject information (Gavrilis *et al.*, 2020; Gyamfi & Sukseemuang, 2018), analyze it, understand it, and know how to handle it. This is why the academic administration must pay special attention that the delivery of the material is timely so as not to hinder learning. In addition, it is crucial that teachers

do not saturate students with content, but rather focus on its quality (Bahati *et al.*, 2019) and ensure that they provide the appropriate amount (Alexander *et al.*, 2019). The fulfillment of these considerations influences students to want to continue their studies, this consequently stimulates them and generates a sense of success, allowing students to achieve their competencies (Harsasi & Sutawijaya, 2018).

The gamified interaction of learners, i.e., the use of game designs in non-playful spaces to increase their engagement and motivation (Prieto, 2020; Ramírez *et al.*, 2020) is an important factor for students to learn through virtual resources; this allows participants to have educational and fun experiences (Cornellà and Estebanell, 2018), while eliminating the gaps built by traditional education. Gamification, coupled with its respective collaboration, generates an interactive and active role of the student (García *et al.*, 2018) and, consequently, contributes to achieving the educational process.

The perception of usefulness within virtual courses by the student body is a crucial element at the time of learning. In the case of online programs, it should be taken into consideration that they allow economic savings and mobility (Caner & Servet, 2020). Thus, because of the notion of usefulness; the performance and prestige of the course are assured (Daneji *et al.*, 2019). Otherwise, without this perception the student will believe that he is wasting his time and learning will be useless (Landrum, 2020).

An additional factor in the role of the student in virtual mode is motivation during the teaching-learning process, since this will allow them to effectively overcome the problems they may encounter during their study (Almoeather, 2020); in addition, motivation causes the educational community to realize that learning is meaningful, productive and satisfactory (Bailey *et al.*, 2020). In addition to motivation, attitude is also a relevant element, as it enables online users' complacency (Ilgaz & Gülbahar, 2020). The aforementioned shows that the student of online courses has an important role in the educational process, so educational institutions, especially universities, should focus on perfecting the role of the student body.

### ***The satisfaction of managing virtual resources***

Virtual resources are a series of open and commercial tools that are used to facilitate, for students, learning mediated by information and communication technologies (ICT) (Quirós and Polo, 2018). Historically, these resources began in the business environment to facilitate the achievement of their objectives; However, due to their success they were adapted to the pedagogical field with important results. In addition, scientific evidence highlights that the educational community, specifically digital natives, prefer digital materials instead of traditional ones because they promote creativity, interaction and satisfaction during the teaching-

learning process (Holder & Bethea, 2018). Thus, among the online resources most used at UNMSM for educational purposes are Zoom, Google Classroom and Google Meet.

In this sense, student satisfaction with managing virtual resources is one of the most important assessments to know how productive and successful an e-learning program is. We can define this type of satisfaction as the expectation that arises when starting a virtual course and the consistency with the achievements that result in its process. In that sense, student satisfaction with managing virtual resources is one of the most important assessments to know how productive and successful an e-learning program is being. We can define this type of satisfaction as the expectation that arises when starting a virtual course and the consistency with the resulting achievements in the process. Therefore, measuring this satisfaction allows educational institutions to control the continuity of students and overcome the difficulties of conventional education using the benefits brought by ICT, such as cost-effectiveness, efficiency and speed in the evaluation processes (Mir et al., 2019). Hassan et al. (2021), in their preliminary study on the satisfaction of virtual graduate students in the Kingdom of Saudi Arabia, state that: "students' satisfaction with online studies is linked with student perceptions about online studies as well as students' current experiences of online studies" (p. 2); in other words, in student satisfaction, both current experiences of online learning and student perceptions of virtual classes come into play, making both significant.

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In addition, the research conducted by Trejo (2021) in Peru is revealing: when studying virtual learning environments (VLE) and the satisfaction of virtual students at the graduate level, he points out that "in the satisfaction of VLE it is important that the student perceives the advantages of the use of these environments in relation to their learning" (pp. 21-22). That is, the

learner in a virtual program will need to visualize the benefits of studying in this mode to achieve satisfaction.

Furthermore, scientific evidence emphasizes that the satisfaction of participants managing virtual resources lies in factors such as self-efficacy, interface, learner engagement and utilitarian performance (Bayrak *et al.*, 2020; Caner & Servet, 2020; Wolverton *et al.*, 2020). Thus, when learners are satisfied with their online studies, they can be expected to perform specific actions, such as seeking to have an Internet connection, selecting and updating learning, accessing specialized databases, and managing electronic learning devices (Siemens, 2004).

When a learner is pleased with his or her learning, he or she is determined to establish good connections to the network to continue learning, since e-learning demands optimal speed from the educational community (Rodríguez *et al.*, 2018). Similarly, a satisfied learner selects and updates digital resources, and will have more opportunities to obtain success in their learning (Sharma *et al.*, 2020).

Another effect of students pleased with their online studies is that they connect to specialized information bases because they perceive them to be useful (Valladares *et al.*, 2019); however, without an optimal internet connection this will be impossible, as problems in having a stable network, such as precarious network access and the high cost of connectivity in poor countries, would also make it difficult to take an online course (Rodríguez *et al.*, 2018). Additionally, the management of electronic devices is a consequence of the satisfaction of managing virtual resources because it generates greater achievements in their training; however, without prior preparation in the use of the device the courses may become insignificant (Abuhassna *et al.*, 2020).

## OBJECTIVE AND HYPOTHESIS OF THE STUDY

This paper is based on the research of Prensky (2001) and Siemens (2004); its objective is to determine the factors of the student role that influence the satisfaction of managing virtual resources. Based on the state of the art of the variables investigated and on previous research, five predictors that positively influence student satisfaction in managing virtual resources were identified for this work, which is the guiding hypothesis for this paper. These factors are: self-efficacy in Internet and computer science, student-content interaction, gamified participation, perceived usefulness and motivation. From these the study model used was formed (see figure 1).





**Figura 1.** Modelo de estudio.  
Fuente: elaboración propia.

## METHODOLOGY

A non-experimental design of correlational-causal level was chosen for the study, with the aim of determining the influence of the independent variables on the dependent variable. The choice of these variables was based on their incidence in previous works, specifically in the research of Prensky (2001) and Siemens (2004). Thus, five independent variables are analyzed: Internet and computer self-efficacy factor (SF), student-content interaction factor (IF), gamified participation factor (PF), perceived usefulness factor (UF) and motivation factor (MF); in addition to a dependent variable: satisfaction with managing virtual resources (S).

## PARTICIPANTS AND DATA COLLECTION

Fieldwork data were collected only once through a transectional survey sent through Google Forms. The participants considered were UNMSM trainees enrolled during 2021 in the Master's degree programs in Education in three areas: Educational Management, University Teaching and Evaluation and Accreditation of Educational Quality. It should be noted that these programs were related to the contingency period, which had to be adapted and taught remotely, since they were conceived before the pandemic in a face-to-face manner. The students chosen were studying between the first and fourth semester of studies during the online mode, with the intention that the participants, based on their experience, would have accurate perceptions of their virtual learning process and determine their satisfaction. A total of 487 trainees (population) were reached.

In addition, in order to obtain better information, a non-probabilistic sampling by intentional selection was implemented, which brought the sample to a total of 184 graduate students. Due to the fact that only a few students willingly agreed to take the survey, teachers were contacted to enter the synchronous sessions in order to apply the surveys to their students. This is how the total of 184 responses and the questionnaires for statistical examination were obtained.

## RESEARCH INSTRUMENTS

Based on Prensky (2001) and Siemens (2004), a questionnaire was developed to analyze the ordinal qualitative variables under study. The indicators of the independent variables were evaluated using a five-point Likert-type scale according to the following conditions: 1 = Never, 2 = Most of the time no, 3 = Some of the time yes, some of the time no, 4 = Most of the time yes, and 5 = Always. Similarly, the indicators of the dependent variable were measured using a five-score Likert-type scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree.

In addition, each variable contained its own indicators: these total 70 items and are arranged to assess the impact of the independent variables on the dependent variable (see Table 1). Likewise, the instrument had a previous section where the participants provided their general information (except for their name, since their collaboration was anonymous) and gave their informed consent to be part of the research.

**Tabla 1.** Instrumento de evaluación

VARIABLE	INDICADORES	CÓDIGO
Factor autoeficacia en internet e informática (FA)	1) Antes de iniciar mis estudios, tenía apreciaciones positivas de mí sobre el uso de internet	FA1
	2) Me percibí positivamente en el uso de la red mientras estudiaba	FA2
	3) Podía manipular la red antes de empezar a estudiar	FA3
	4) Confié en mí al utilizar la red durante mis estudios	FA4
	5) Pude resolver problemas por mí mismo cuando navegaba en internet	FA5
	6) Tenía la capacidad de manejar dispositivos electrónicos antes de iniciar la maestría	FA6
	7) Confié en mí al utilizar dispositivos electrónicos durante mis estudios	FA7
	8) Pude resolver problemas por mí mismo cuando usaba dispositivos electrónicos	FA8
Factor interacción estudiante-contenido (FI)	1) Utilicé contenidos ofrecidos por el docente que me gustaron	FI1
	2) Utilicé contenidos ofrecidos por el docente que me producían interés por seguir investigando	FI2
	3) Utilicé contenidos de alto nivel en los cursos virtuales ofrecidos por el docente	FI3
	4) Utilicé materiales ofrecidos por el docente que me eran útiles para la maestría	FI4
	5) Tuve libre acceso a los contenidos virtuales del curso	FI5
	6) Pude acceder a los contenidos del curso desde el dispositivo que me era más factible	FI6
	7) Accedí a los contenidos del curso cuando disponía de tiempo	FI7
	8) Accedí a los contenidos virtuales del curso antes de la sesión de clase sincrónica	FI8
Factor participación gamificada (FP)	1) Tuve acceso a recursos lúdicos que me permitían emplear la creatividad e imaginación durante mis estudios	FP1
	2) Ingresé a herramientas flexibles que me permitían aprender relajadamente	FP2
	3) Tuve experticia con los materiales lúdicos usados en el curso	FP3
	4) Ayudé a mis compañeros de clase a utilizar un recurso lúdico	FP4
	5) El profesor puso a nuestra disposición un tutorial para interactuar en el recurso lúdico	FP5
	6) Consulté buscadores de internet para saber cómo emplear el recurso lúdico	FP6
	7) Percibí que el docente se involucró con el recurso lúdico	FP7
	8) Observé que mis compañeros de estudio se involucraron con el recurso lúdico	FP8
Factor utilidad percibida (FU)	1) Me fue posible ahorrar económicamente en movilidad durante la maestría	FU1
	2) Pude economizar no gastando en materiales impresos	FU2
	3) Tuve disponibilidad de conectarme desde cualquier lugar durante mis estudios	FU3
	4) Ahorré tiempo de traslado al estudiar la maestría en línea	FU4
	5) Los estudios me permitieron un perfeccionamiento profesional continuo	FU5



VARIABLE	INDICADORES	CÓDIGO
Factor utilidad percibida (FU)	6) Logré realizar actividades grupales en un horario flexible que fuera adecuado para todos los integrantes	FU6
	7) Pude comunicarme para el trabajo colaborativo desde cualquier dispositivo de fácil acceso durante mis estudios	FU7
Factor motivación (FM)	1) Me sentí motivado por alcanzar una mejora económica durante mis estudios virtuales	FM1
	2) Me motivó conocer a personas que me permitieran tener una mayor red de contactos laborales durante la maestría	FM2
	3) Me incentivó la idea de poder acceder a un mejor puesto laboral a consecuencia de obtener un posgrado al terminar mis estudios	FM3
	4) Me impulsó la meta de adquirir un mayor aprendizaje durante mis estudios	FM4
	5) Me mantuvo motivado la intención de seguir profesionalizándome durante la maestría	FM5
	6) Me motivó el gusto por aprender durante mis estudios virtuales	FM6
	7) Me generó motivación la sensación de estar aprendiendo nuevos conocimientos dentro de la maestría	FM7
La satisfacción de gestionar recursos virtuales (S)	1) Adquirí una computadora portátil para conectarme a la red durante las clases virtuales	S1
	2) Adquirí una computadora de escritorio para conectarme a la red durante las clases virtuales	S2
	3) Adquirí un teléfono inteligente para conectarme a la red durante las clases virtuales	S3
	4) Supervisé constantemente la conexión a internet para evitar algún problema con la red durante las clases virtuales	S4
	5) Procuré que solo un dispositivo electrónico estuviera conectado al alimentador de la red durante las clases virtuales	S5
	6) Tuve que comunicarme con el proveedor del servicio de internet para resolver algún problema con la conexión durante la maestría	S6
	7) Busqué soluciones a problemas con la red a través de motores de búsqueda en internet durante las clases	S7
	8) Reforcé la calidad de la conexión a internet con el uso de datos en dispositivos móviles	S8
	9) Mejoré la conexión a internet a través de una red wifi al usar los recursos digitales	S9
	10) Me conecté a la red a través de un cable directo del dispositivo al módem de internet en las clases virtuales	S10
	11) Interactué con el navegador de internet para adquirir información oportuna sobre el flujo de la red	S11
	12) Accedí a recursos educativos digitales en la maestría	S12
	13) Usé de manera preferencial los recursos educativos digitales	S13
	14) Utilicé materiales educativos digitales de acuerdo con mis posibilidades	S14
	15) Pude dominar el contenido del material educativo virtual	S15
	16) Compartí aprendizajes con mis compañeros sobre el material educativo digital	S16
	17) Busqué utilizar una versión adecuada de la herramienta educativa digital para mi dispositivo electrónico	S17
	18) Accedí a fuentes de información especializada en red a pesar de las limitaciones institucionales	S18

VARIABLE	INDICADORES	CÓDIGO
La satisfacción de gestionar recursos virtuales (S)	19) Ahondé constantemente en información en bases de datos especializadas para mi investigación	S19
	20) Pude utilizar mi dominio de una lengua extranjera para conectarme a bases de datos internacionales alojadas en internet	S20
	21) Busqué asesoría particular para tener conocimientos previos sobre un tema de interés antes de iniciar la búsqueda de fuentes de información en internet	S21
	22) Investigué en internet cómo consultar fuentes de información especializada	S22
	23) Utilicé un teléfono inteligente adecuado durante mis estudios	S23
	24) Utilicé una computadora portátil adecuada durante la maestría	S24
	25) Utilicé una computadora de escritorio para mis clases virtuales	S25
	26) Me he conectado a internet desde una red wifi durante mis estudios	S26
	27) Utilicé los datos móviles de mi celular para conectarme a las clases virtuales	S27
	28) Utilicé una conexión alámbrica para conectarme a mis clases virtuales	S28
	29) Utilicé sin distracciones el dispositivo electrónico con el que me he conectado a las clases	S29
	30) Utilicé el dispositivo electrónico teniendo cuidado evitar cualquier falla técnica durante mis clases	S30
	31) Consistentemente utilicé el mismo dispositivo electrónico para ingresar a las clases	S31
	32) Consistentemente destiné el mismo horario para el uso del dispositivo electrónico durante la maestría	S32

Fuente: elaboración propia.

## DATA ANALYSIS

To achieve the purposes of the research and to demonstrate the five-factor hypothesis, some statistical tests were performed using SPSS (version 25). First, the reliability and validity of the data collected from the student surveys were tested through confirmatory factor analysis (CFA), Cronbach's Alpha coefficient and model fit. Finally, the hypotheses were tested to determine the influence between variables by making use of the nonparametric Spearman's Rho test for the ordinal qualitative variables to be investigated (Lim & Park, 2011), as there is no normal distribution in the data (Hernández & Mendoza, 2018) according to the Kolmogorov-Smirnov test, as can be seen in Table 2.

Tabla 2. Análisis de la normalidad

VARIABLE	NIVEL DE SIGNIFICANCIA	OBSERVACIONES
Factor autoeficacia en internet e informática	,006	Distribución no normal
Factor interacción estudiante-contenido	,000	Distribución no normal
Factor participación gamificada	,000	Distribución no normal
Factor utilidad percibida	,000	Distribución no normal
Factor motivación	,000	Distribución no normal
La satisfacción de gestionar recursos virtuales	,012	Distribución no normal

Fuente: elaboración propia a partir del estudio de la normalidad de los datos.

In short, according to scholars, for the normality analysis it should be considered that the  $\alpha = 0.05$ . On the one hand, in the case of normal distributions the significance level must be greater than alpha ( $p > 0.05$ ); therefore, the null hypothesis is accepted and the alternative hypothesis is rejected. On the other hand, the opposite occurs when there is no normal distribution ( $p < 0.05$ ). In the case of these study variables, the significance

level for each one is less than 0.05, so they do not have a normal distribution. Consequently, the Spearman's Rho nonparametric test will be used for the inferential analysis.

## RESULTS

In testing the validity of the indicators using the CFA, each indicator can be categorized as valid if it contains a factor loading greater than 0.40, 95% significance, and clustering in each variable group (Hoban et al., 2005). According to the CFA finding, it is observed that the Kaiser-MeyerOlkin sampling adequacy measure (KMO-SA) is .863, which indicates that the factor analysis can be continued. As long as the value is greater than 0.50 it is acceptable; in fact, the KMO-SA measure fluctuates between 0 and 1. Bartlett's test of sphericity shows a measure of 8889.628 and a significance level of .000; therefore, according to these conditions, the factor analysis can be continued.

The findings of the analysis show that there are twelve items that do not obey the validity standards, these are FM3, FM4, FM5, S1, S2, S10, S14, S21, S24, S26, S30 and S31. Items FM3, FM4 and FM5 have duplicate values, appearing in their variable group called student-content interaction factor (component 2) and in component 5. Item S10 has replicated values in its variable group of the gamified participation factor (component 3) and in component 6. Item S14 shows a propagated value in component 1 and component 5. With this in consideration, the twelve items are excluded from the data and are not included in the following analysis.

With the discrimination of these items, the factor analysis shows that the KMO-SA value is .880, Bartlett's test of sphericity is 6872.379, and a significance of .000. From these results the factor analysis can continue. The findings of all the items contain a factor load greater than 0.4 and are grouped in their variable group; this affirms that all the items are valid. The Path Analysis (PA) in Figure 2 evidences the impact of the variables and that all variable indicators are valid, the estimated values being greater than 0.5 (Hair et al., 2014).

In this sense, according to the results obtained in the PA, it was proven that the final model achieved a standardized solution of the Path coefficients as follows: PF (1.00) and FM (.32) (according to Cohen, 1988, a medium effect level) had important direct explanatory contributions in the satisfaction of managing virtual resources (S), followed by FA (.09), FI (.02) and FU (.02), which expressed small but significant effects. In other words, statistically all the independent variables proved to be significant and influenced the dependent variable.

Following the validity test, the next step was to test the structural model. The goodness-of-fit models were first examined for accuracy. According to

our hypotheses, the finding indicated that the model is accepted and meets the goodness-of-fit indicators. The result evidences that the Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Normalized Fit Index (NFI) are recommended values and have perfect fit (Baumgartner & Homburg, 1996; Klem, 2000; Kline, 2011), indicating that the model fits quite well (see Table 4).

**Tabla 4.** Ajuste del modelo

MEDIDAS DE AJUSTE	VALORES	MEDIDAS SUGERIDAS PARA UN AJUSTE PERFECTO	OBSERVACIONES
CFI	0.951	$0.95 \leq CFI \leq 1.00$	Ajuste perfecto
NFI	0.965	$0.95 \leq NFI \leq 1.00$	Ajuste perfecto
RMSEA	0.000	$0.00 \leq RMSEA \leq 0.05$	Ajuste perfecto

Fuente: elaboración propia según el ajuste del modelo.

The next analysis is the reliability analysis using Cronbach's Alpha (Cronbach, 1951). The total items and coefficients are used to test the reliability of each variable. When the variable obtains a value greater than 0.70 it can be categorized as a reliable variable (Hair *et al.*, 2014); in other words, the variable has managed to pass the reliability test. Consequently, the internal consistency of the instrument items is acceptable. The findings of the Cronbach's reliability test showed that the variables in this study are reliable (see Table 5).

**Tabla 5.** Análisis de confiabilidad

VARIABLE	ALFA DE CRONBACH BASADO EN ITEMS ESTANDARIZADOS	OBSERVACIONES
Factor autoeficacia en internet e informática	.926	Confiable
Factor interacción estudiante-contenido	.864	Confiable
Factor participación gamificada	.897	Confiable
Factor utilidad percibida	.876	Confiable
Factor motivación	.905	Confiable
La satisfacción de gestionar recursos virtuales	.910	Confiable

Fuente: elaboración propia a partir de la fiabilidad del instrumento.

To understand the effect between variables, next, Spearman's Rho nonparametric test was done, where it is statistically shown that the independent variables have influence on the dependent variable if they obtained a p-value of  $\leq 0.05$ , meaning that the independent variables significantly affect on the dependent variable, with a confidence at 95% and a maximum level of deviation rate of 5%. These findings of Spearman's Rho are evidenced in Table 6.



Tabla 6. Resultados de la correlación de Rho de Spearman

VARIABLE INDEPENDIENTE	VARIABLE DEPENDIENTE	COEFICIENTE DE CORRELACIÓN	SIGNIFICANCIA
Factor autoeficacia en internet e informática	La satisfacción de gestionar recursos virtuales	,268	,000
Factor interacción estudiante-contenido		,420	,000
Factor participación gamificada		,401	,000
Factor utilidad percibida		,175	,017
Factor motivación		,320	,000

Fuente: elaboración propia según la correlación de las variables.

The results in Table 6 show that the five independent variables have a significant correlation in the satisfaction of managing virtual resources, which is reflected in the lower significance value of  $\alpha = 0.05$ . It is also necessary to specify, in addition to order, that from a higher score the factors student-content interaction, gamified participation, motivation and self-efficacy on the Internet and computer science have a weak positive correlation in the satisfaction of managing virtual resources, which is evidenced by the value of the correlation coefficient at 0, 420, 0, 401, 0, 320 and 0.268. In addition, the variable called perceived usefulness factor obtains a very weak positive correlation (0, 175) in the dependent variable.

In that sense, and taking into account that all the independent variables influenced the dependent variable, by its significance level  $< 0.05$ , it is affirmed that Spearman's Rho test can be used to determine all the factors that affect the satisfaction of managing virtual resources in this study.

## DISCUSSION

Internet and computer self-efficacy have become elements that influence student satisfaction. Current research asserts that it is extremely important for students managing virtual educational resources to see themselves capable of handling and solving difficulties on the network by themselves, because this will make them feel satisfied in the online educational process (Bayrak et al., 2020; Herrador *et al.*, 2019; Wolverton et al., 2020). Otherwise, when learners do not perceive themselves with the ability to perform in online programs, very low levels of satisfaction are usually obtained, which bring learning failure. In this sense, in Mexico, student satisfaction in virtuality has been analyzed at the graduate level; these studies evidenced that, despite psychological deficiencies in the knowledge of digital resources and economic absences in the positioning of electronic devices, students managed to feel pleased with their training through the virtual mode (Hernández and Juárez, 2018).

According to our work, another relevant factor that influences satisfaction is student interaction with the content. Students in online modes require materials that allow them to approach the information in a graphical way, texts and hypertexts that host multitasking, as it has been seen that these



elements contribute to students' better results in their learning processes and, consequently, achieve greater satisfaction in this regard (Alexander *et al.*, 2019; Alqurashi, 2019; Bahati *et al.*, 2019; Bashir, 2019; Divjak *et al.*, 2018; Gavrilis *et al.*, 2020; Gyamfi & Sukseemuang, 2018; Harsasi & Sutawijaya, 2018; Muzammil *et al.*, 2020; Weidlich & Bastiaens, 2018).

Also, the analysis conducted shows that gamified engagement is a third important factor that determines the satisfaction of managing virtual resources. Generally, learners prefer that online courses allow them to develop their creativity and imagination when learning, that, despite the rigorousness of the research, the tools allow them to relax through playful strategies. Undoubtedly, gamification strategies provide great satisfaction and benefits to participants (Carrión, 2018; Cornellà and Estebanell, 2018; García *et al.*, 2018; Prieto, 2020).

When contrasting the hypotheses of our research, it was determined that perceived usefulness is another factor that influences student satisfaction. When students are convinced that online modes allow them to save on mobility, economy, and materials, satisfaction levels increase (Abuhassna *et al.*, 2020; Caner & Servet, 2020; Daneji *et al.*, 2019; Landrum, 2020; Nagy, 2018). Motivation is another predictive factor in satisfaction; students who pursue intrinsic and extrinsic encouragement achieve high levels of complacency in their online studies, while participants who do not feel motivated in their learning process underperform (Bailey *et al.*, 2020; Ilgaz & Gülbahar, 2020; Manrique & Sanchez, 2019; Shonfeld & Magen, 2020).

The strengths of this research are found in the innovative theme around which the analysis revolves, the praxeological usefulness for the university community regarding the elements that satisfy the student body and the proposal of a useful measuring instrument for future studies. It is worth mentioning that this research has specific limitations, since the data analysis did not take into account the disparity that could exist in the perceptions according to the generation to which the university learners belong, nor the socioeconomic and geographic variables of the individuals, since access to technology and the network is a great challenge for online student satisfaction. However, the opportunities of this work lie in its citation in multiple fields of study, being a reference for future research on virtual education, and its potential application to contribute to university quality.

## CONCLUSIONS

The purpose of this paper was to determine the student factors that influence the satisfaction with managing virtual resources of the participants of three master's degree programs. In order of priority, the findings showed that the student role predictors determined (the student-content interaction factor, the gamified participation factor, the

motivation factor, the Internet and computer self-efficacy factor, and the perceived usefulness factor) have a positive influence on students' satisfaction in managing virtual resources. In this regard, the perceived usefulness factor obtained a very weak positive correlation in student satisfaction; therefore, it is considered that the institution should evaluate the fulfillment of the benefits of the virtual studies it offers.

The results on the role of students are relevant to achieve satisfaction, which leads to worry about attending and accompanying the students in the online educational process so that they interact with gamified content, feel motivated, are self-efficient and perceive that the programs are useful, both socially and personally as well as professionally. In this regard, it is suggested that future research should delve deeper into the different generational perceptions of the learner and the socioeconomic and geographic variables, especially in countries with scarce resources, in which accessibility to the Internet and technology is insufficient.

The main contributions of this analysis are found in pointing out what the important elements are for students to achieve satisfaction in virtual courses. At the same time, it offers the university authority a novel study that seeks to contribute to the improvement of educational quality and recommends the creation of an instrument that can be applied in any university context.

Finally, it is hoped that the results of this research will be used to improve the master's program in the virtual mode implemented during the covid-19 pandemic, and that it will even serve as evidence for the post-pandemic period in the university. It is hoped that future research will continue to adjust the structural model of this research and that it will go deeper with qualitative and mixed approaches, or by adding other predictors of student satisfaction.

Abuhassna, H.; Al-Rahmi, W.; Yahya, N.; Zakaria, M.; Kosnin, A. & Darwish, M. (2020). Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education*, 17(38), 1-23. <http://doi.org/10.1186/s41239-020-00216-z>

Almoeather, R. (2020). Effectiveness of blackboard and edmodo in self-regulated learning and educational satisfaction. *Turkish Online Journal of Distance Education*, 21(2), 126-140. <http://doi.org/10.17718/TOJDE.728140>

Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID19. *Journal of Education and E-Learning Research*, 7(3), 285-292.  
<https://doi.org/10.20448/journal.509.2020.73.285.292>

Bahati, B.; Fors, U.; Hansen, P.; Nouri, J. & Mukama, E. (2019). Measuring learner satisfaction with formative e-assessment strategies. *International Journal of Emerging Technologies in Learning*, 14(7), 61-79.  
<http://doi.org/10.3991/ijet.v14i07.9120>

Bailey, D.; Almusharraf, N. & Hatcher, R. (2020). Finding satisfaction: intrinsic motivation for synchronous and asynchronous communication in the online language learning context. *Education and Information Technologies*, 26, 1-21. <http://doi.org/10.1007/s10639-020-10369-z>

Bashir, K. (2019). Modeling e-learning interactivity, learner satisfaction and continuance learning Intention in Ugandan higher learning institutions. *International Journal of Education and Development Using Information and Technology*, 15(1), 1-21.  
[https://eric.ed.gov/?q=student+satisfaction+of+virtual+education&ft=on&ff1=dySince\\_2019&ff2=eduHigher+Education&ff3=pubJournal+Articles&pg=7&id=EJ1214256](https://eric.ed.gov/?q=student+satisfaction+of+virtual+education&ft=on&ff1=dySince_2019&ff2=eduHigher+Education&ff3=pubJournal+Articles&pg=7&id=EJ1214256)

Baumgartner, H. & Homburg, C. (1996). Applications of structural equation modeling in marketing and consumer research: A review. *International Journal of Research in Marketing*, 13(2), 139-161. [https://doi.org/10.1016/0167-8116\(95\)00038-0](https://doi.org/10.1016/0167-8116(95)00038-0)

Bayrak, F.; Tibi, M. & Altun, A. (2020). Development of Online Course Satisfaction Scale. *Turkish Online Journal of Distance Education*, 21(4), 110-123. <http://doi.org/10.17718/TOJDE.803378>

Caner, Ö. & Servet, R. (2020). Satisfaction, utilitarian performance and learning expectations in compulsory distance education: A test of mediation effect. *Educational Research and Reviews*, 15(6), 290-297. <http://doi.org/10.5897/err2020.3995>

Carrión, E. (2018). El uso de la gamificación y los recursos digitales en el aprendizaje de las ciencias sociales en la educación superior. *DIM: Didáctica, Innovación y Multimedia*, 36, 1-14. <https://raco.cat/index.php/DIM/article/view/340828>

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Lawrence Erlbaum Associates.

Cornellà, P. y Estebanell, M. (2018). GaMoodlification: Moodle al servicio de la gamificación del aprendizaje. *Campus Virtuales*, 7(2), 9-25. <https://dialnet.unirioja.es/servlet/articulo?codigo=6681868>

Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334. <https://doi.org/10.1007/BF02310555>

Daneji, A.; Ayub, A. & Khambari, M. (2019). The effects of perceived usefulness, confirmation and satisfaction on continuance intention in using massive open online course (MOOC). *Knowledge Management and E-Learning*, 11(2), 201-214. <http://doi.org/10.34105/j.kmel.2019.11.010>

Díaz-Camacho, R.; Rivera, J.; Encalada, I. y Romani, Ú. (2021). La satisfacción estudiantil en la educación virtual: una revisión sistemática internacional. *Chakiñan, Revista de Ciencias Sociales y Humanidades*, (16), 177-193. <http://doi.org/10.37135/chk.002.16.11>

Divjak, M.; Rupel, V. & Lešnik, K. (2018). The impact of study attitudes and study behavior on satisfaction of online students with the implementation of online study programs. *Educational Media International*, 55(3), 287-300. <http://doi.org/10.1080/09523987.2018.1512450>

García, L. (2017). Educación a distancia y virtual: calidad, disrupción, aprendizaje adaptativo y móvil. *RIED. Revista Iberoamericana de Educación a Distancia*, 20(2), 9-25. <http://doi.org/10.5944/ried.20.2.18737>

García, S.; Idrissi, M.; Ortega, A. y Gómez, E. (2018). Uso de la colaboración y la gamificación en MOOC: un análisis exploratorio. *RIED. Revista Iberoamericana de Educación a Distancia*, 21(2), 263-283. <http://doi.org/10.5944/ried.21.2.20410>

Gavrilis, V.; Mavroidis, I. & Giossos, Y. (2020). Transactional Distance Theory and Student Satisfaction. *Turkish Online Journal of Distance Education*, 21(5), 48-62. <http://doi.org/10.17718/tojde.762023>

Ghassan Al Azmeh, S. (2019). The relationship between e-learning service and student satisfaction a case study at the Syrian Virtual University (SVU). *Business, Management and Education*, 17(0), 49-71. <http://doi.org/10.3846/bme.2019.7451>

Gyamfi, G. & Sukseemuang, P. (2018). EFL learners' satisfaction with the online learning program, Tell Me More. *Turkish Online Journal of Distance Education*, 19(1), 183-202. <http://doi.org/10.17718/tojde.382798>

Hair, J.; Black, W.; Babin, B. & Anderson, R. (2014). *Multivariate Data Analysis*. Pearson Education Limited.

Harsasi, M. & Sutawijaya, A. (2018). Determinants of student satisfaction in online tutorial: A study of a distance education institution. *Turkish Online Journal of Distance Education*, 19(1), 89-99. <http://doi.org/10.17718/tojde.382732>

Hassan, S.; Algahtani, F.; Zrieq, R.; Aldhmadi, B.; Atta, A.; Obeidat, R. & Kadri, A. (2021). Academic Self-Perception and Course Satisfaction among University Students Taking Virtual Classes during the COVID-19 Pandemic in the Kingdom of Saudi-Arabia (KSA). *Education Sciences*, 11(13), 1-14. <http://doi.org/10.3390/educsci11030134>

Hernández, C. y Juárez, M. (2018). Satisfacción de los estudiantes en un curso propedéutico de matemáticas en e-modalidades. *Apertura*, 10(2), 6-19. <http://doi.org/10.32870/ap.v10n2.1384>

Hernández, R. y Mendoza, C. (2018). *Metodología de la investigación: Las rutas cuantitativa, cualitativa y mixta*. McGraw-Hill Interamericana Editores.

Herrador, T.; Hernández, M. & Sanguino, R. (2019). Feelings of satisfaction in mature students of financial accounting in a virtual learning environment: an experience of measurement in higher education. *International Journal of Educational Technology in Higher Education*, 16(20), 1-19. <http://doi.org/10.1186/s41239-019-0148-z>

Hoban, J.; Lawson, S.; Mazmanian, P.; Best, A. & Seibel, H. (2005). The self-directed learning readiness scale: a factor analysis study. *Medical Education*, 39(4), 370-379. <http://doi.org/10.1111/j.1365-2929.2005.02140.x>

Holder, A. & Bethea, T. (2018). A Collaborative Project Exploring Open Educational Resources and Virtual Reality. *Association Supporting Computer Users in Education*, 34-42. <https://eric.ed.gov/?id=ED592861>

Ilgaz, H. & Gülbahar, Y. (2020). Examining e-Learners' Preferences and Readiness Satisfaction: A Holistic Modeling Approach. *Open Praxis*, 12(2), 209-222. <http://doi.org/10.5944/openpraxis.12.2.1070>

Klem, L. (2000). Structural equation modeling, en L. Grimm & P. Yarnold (eds.), *Reading and understanding more multivariate statistics* (227-260). American Psychological Association.

Kline, R. (2011). *Principles and practice of structural equation modeling*. The Guilford Press.



Landrum, B. (2020). Examining students' confidence to learn online, self-regulation skills and perceptions of satisfaction and usefulness of online classes. *Online Learning*, 24(3), 128-146. <http://doi.org/10.24059/olj.v24i3.2066>

Lim, S. & Park, T. (2011). The declining association between earnings and returns: Diminishing value relevance of earnings or noisier markets? *Management Research Review*, 34(8), 947- 960. <https://doi.org/10.1108/01409171111152538>

Manrique, K. y Sánchez, M. (2019). Satisfacción estudiantil universitaria: un referente para elevar los indicadores de los cursos en línea impulsados por la Coordinación General de Educación Virtual de la UAGro. *Cuaderno de Pedagogía Universitaria*, 16(31), 17-30. <http://doi.org/10.29197/cpu.v16i31.321>

Mir, K.; Iqbal, M. & Shams, J. (2019). An Investigation of AIOU Students' Satisfaction about Formative M-Assessment Using SMS Technology. *Pakistan Journal of Distance and Online Learning*, 5(2), 157-174. <http://journal.aiou.edu.pk/journal1/index.php/PJDOL/article/view/460>

Muzammil, M.; Sutawijaya, A. & Harsasi, M. (2020). Investigating Student Satisfaction In Online Learning: The Role Of Student Interaction And Engagement In Distance Learning University. *Turkish Online Journal of Distance Education*, 21, 88-96. <http://doi.org/10.17718/TOJDE.770928>

Nagy, J. (2018). Evaluation of online video usage and learning satisfaction: An extension of the technology acceptance model. *The International Review of Research in Open and Distributed Learning*, 19(1), 160-185. <https://www.irrodl.org/index.php/irrodl/article/view/2886>

Organización de las Naciones Unidas (ONU). (18 de mayo de 2020). Diez recomendaciones para estudiar a distancia durante la emergencia del coronavirus. *Noticias ONU*. <https://news.un.org/es/story/2020/03/1471342>

Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, 9(5), 1-6. <https://doi.org/10.1108/10748120110424816>

Prieto, J. (2020). Una revisión sistemática sobre gamificación, motivación y aprendizaje en universitarios. *Teoría de la Educación. Revista Interuniversitaria*, 32(1), 73-99. <http://doi.org/10.14201/teri.20625>

Quirós, E. y Polo, M. (2018). Recursos abiertos de información geográfica para investigación y documentación científica. *Revista Española de Documentación Científica*, 41(3), 1-16. <http://doi.org/10.3989/redc.2018.3.1512>

Ramírez, P.; Ortiz, A. y Lobo, R. (2020). Experiencias significativas de la implementación de la gamificación en los cursos de programación de computadores. *Educación en Ingeniería*, 15(29), 42-51. <https://educacioneningenieria.org/index.php/edi/article/view/1031>

Rodríguez, Y.; Campaña, R. y Gallego, M. (2018). Iniciativas para la adopción y uso de recursos educativos abiertos en instituciones de educación superior. *Educación Médica Superior*, 32(4), 273-285.

[http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=So864-21412018000400022](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=So864-21412018000400022)

Sharma, K.; Deo, G.; Timalina, S.; Joshi, A.; Shrestha, N. & Neupane, H. (2020). Online learning in the face of covid-19 pandemic: Assessment of students' satisfaction at Chitwan medical college of Nepal. *Kathmandu University Medical Journal*, 70(2), 40-47. <http://doi.org/10.3126/kumj.v18i2.32943>

Shonfeld, M. & Magen, N. (2020). The Impact of an Online Collaborative Program on Intrinsic Motivation, Satisfaction and Attitudes Towards Technology. *Technology, Knowledge and Learning*, 25(2), 297-313. <http://doi.org/10.1007/s10758-017-9347-7>

Siemens, G. (2004). Connectivism: A Learning Theory for the Digital Age. *Elearnspace*, 1-7. [https://jotamac.typepad.com/jotamacs\\_weblog/files/Connectivism.pdf](https://jotamac.typepad.com/jotamacs_weblog/files/Connectivism.pdf)

Siemens, G. (2006). *Knowing Knowledge*. [https://amysmooc.files.wordpress.com/2013/01/knowningknowledge\\_lowres-1.pdf](https://amysmooc.files.wordpress.com/2013/01/knowningknowledge_lowres-1.pdf)

Trejo, W. (2021). *Entornos virtuales de aprendizaje y la satisfacción percibida en estudiantes de posgrado de una universidad privada, 2021* (tesis de maestría). Universidad César Vallejo, Lima, Perú. [https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/68517/Trejo\\_C WS-SD.pdf?sequence=1&isAllowed=y](https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/68517/Trejo_C WS-SD.pdf?sequence=1&isAllowed=y)

Valladares, M.; Pulido, C.; Miñan, A.; Simbaña, K.; Rodriguez, J.; Brito, J.; Aveiro, T.; Pineda, J.; Arce, L.; Toscano, A.; Cuevas, L.; Martinez, L.; Henríquez, D.; Vilela, M.; Marino, M.; Alvarez, J.; Huanca, L. y Mejia, C. (2019). El uso de fuentes y tecnologías de la información y comunicación según el tipo de universidad en siete países de América Latina. *Ciencia e Investigación Médica Estudiantil Latinoamericana*, 24(1). <http://doi.org/10.23961/cimel.v24i1.1215>

Weidlich, J. & Bastiaens, T. (2018). Technology matters – The impact of transactional distance on satisfaction in online distance learning. *The International Review of Research in Open and Distributed Learning*, 19(3), 222-242. <http://doi.org/10.19173/irrodl.v19i3.3417>

Wolverton, C.; Guidry, B. & Lanier, P. (2020). The impact of computer self efficacy on student engagement and group satisfaction in online business courses. *The Electronic Journal of E-Learning*, 18(2), 175-188. <http://doi.org/10.34190/EJEL.20.18.2.006>



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