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Technology Acceptance Model (TAM) applied to a Disciplinary Social Network for online psychology students

Modelo de Aceitação de Tecnologia (TAM) aplicado a uma rede social disciplinar para estudantes de psicologia on-line

Modelo de Aceptación Tecnológica (TAM) aplicado a una red social disciplinar para estudiantes de psicología en línea

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Abstract
Social networks have been present in people's daily lives to share information and communicate with family and friends. In the educational field, they have come up with commonly used social networks such as Facebook and Twitter-X, however, these networks have been accused of accessing user data without their consent for marketing purposes. In this scenario, there are open-source social networks that can be used in the educational field, thus creating Disciplinary Social Networks (Disciplinary SN). Our research objective is to evaluate the Attitude, Intention to Use, Perceived Usefulness, Ease of Use, Trust and Perceived Risk of a Disciplinary Social Network. For this, we used a modified Technology Acceptance Model (TAM) instrument. The sample consisted of 211 university students from an online psychology degree and users of a Disciplinary Social Network based on the Mastodon social network. The results obtained show considerably high means in all scales of the modified TAM instrument, except for perceived risk, which obtained a low mean. It is concluded that the Disciplinary Social Network was perceived as a safe and reliable environment, with a low perception of risk, in contrast to the findings of other authors who evaluated the same elements in commonly used social networks such as Facebook.
Keywords: Social networks; E-learning; Open source software; Psychology; Teaching.

Resumo
As redes sociais estão presentes na vida cotidiana das pessoas para compartilhar informações e se comunicar com familiares e amigos. No campo educacional, elas estão lado a lado com as redes sociais comumente usadas, como o Facebook e o Twitter-X. No entanto, essas redes têm sido apontadas por acessar os dados dos usuários sem seu consentimento para fins de marketing. Nesse cenário, existem redes sociais de código aberto que podem ser usadas no ambiente educacional, criando assim as Redes Sociais Disciplinares. O objetivo de nossa pesquisa foi avaliar a atitude, a intenção de uso, a utilidade percebida, a facilidade de uso, a confiança e o risco percebido de uma rede social disciplinar. Para isso, usamos um instrumento modificado do Modelo de Aceitação de Tecnologia (TAM). A amostra foi composta por 211 estudantes universitários de um curso de psicologia on-line, usuários de uma rede social disciplinar baseada na rede social Mastodon. Os resultados obtidos mostram médias consideravelmente altas em todas as escalas do instrumento TAM modificado, com exceção do Risco Percebido, que obteve uma média baixa. Conclui-se que a Rede Social Disciplinar foi percebida como um ambiente seguro e confiável, com baixo risco percebido, em contraste com os resultados de outros autores que avaliaram os mesmos itens em redes sociais comumente usadas, como o Facebook.
Palavras-chave: Redes sociais; Educação on-line; Software livre; Psicologia; Ensino.

Resumen
Las redes sociales han estado presentes en la vida cotidiana de las personas para compartir información y comunicarse con familiares y amigos. En el ámbito educativo han llegado de la mano de redes sociales comúnmente empleadas como

Facebook y Twitter-X, sin embargo, estas redes han sido señaladas por acceder a datos de los usuarios sin su consentimiento con fines de marketing. En este escenario existen redes sociales de código abierto que pueden ser utilizadas en el ámbito educativo, creando así Redes Sociales Disciplinares. Nuestro objetivo de investigación fue el de valuar la Actitud, Intención de Uso, Utilidad Percibida, Facilidad de uso, Confianza y Riesgo Percibido de una Red Social Disciplinar. Para esto, empleamos un instrumento modificado del Modelo de Aceptación Tecnológica (TAM). La muestra estuvo conformada por 211 estudiantes universitarios de una carrera en línea de psicología, usuarios de una Red Social Disciplinar basada en la red social Mastodon. Los resultados obtenidos muestran medias considerablemente altas en todas las escalas del instrumento TAM modificado, con excepción de Riesgo Percibido que obtuvo una media baja. Se concluye que la Red Social Disciplinar se percibió como un entorno seguro y confiable, con baja percepción de riesgo, en contraposición con los hallazgos de otros autores que evaluaron los mismos elementos en las redes sociales comúnmente empleadas como Facebook.
Palabras clave: Redes sociales; Educación en línea; Software libre; Psicología; Enseñanza.

1. Introduction

1.1 Social networks most used in education

Social networks have become a useful tool in the educational field, not only because of the accessibility they have to facilitate communication and socialization within a group but also because of the possibility of providing spaces for the development of digital skills to students. These types of spaces are necessary in higher education because they provide tools that promote training in Information and Communication Technologies (ICT), which have not only modified teaching in the class but have also been positioning themselves as an almost indispensable tool in the common life of all citizens around the world (Martínez-Sala & Alemany-Martínez, 2021; Fuentes et al. 2021).

Several authors have reported using digital social networks in the educational field as a trend that has been growing in the last five years and that intensified with the 2020 global pandemic. Fuentes et al. (2021) carried out a systematic review that collected important information regarding the variables, their effect, and possible lines of research (Table 1):

Table 1 - Main elements found in a systematic review.

Variables of interest	Effects	Possible lines of research
Cultural competence Gender education Collaborative work Learning communities Motivation Academic performance E-learning B-learning Student empowerment	Collaborative learning Interactivity Development of digital, communicative and linguistic skills.	Analysis of digital social networks as educational media Academic use of digital social networks Student perception of digital social networks Limitations of digital social networks Ethical education

Source: Prepared from Fuentes et al. (2021).

An important aspect to consider is the type of digital social network currently implemented since its use has diversified concerning pedagogical needs but, above all, with the educational level. Martínez-Sala and Alemany-Martínez (2021) carried out interesting research in higher education in which they mention the most used commercial social networks in the educational field. The authors reported that the five most used social networks are WhatsApp, Instagram, YouTube, Facebook, and Twitter; regarding commercial social networks for educational use, Facebook, Instagram, WhatsApp, YouTube, and Twitter were mentioned in the first five places, but when identifying the most used social networks for learning, YouTube moved to first place, and Facebook occupied the second place.

Another relevant element to value that has allowed the increase in the use of social networks in education is the perceptions of both using and satisfaction reported by the student population; Maldonado et al. (2019) mention that the attitude

of the students has been very positive regarding the use of these tools in the educational field, in fact, several studies indicate that it is the students themselves who have resorted to their using to integrate groups or solve problems and doubts. The use of social networks has even transcended the classroom and has been used by students to organize student movements, such as the yellow umbrellas in Hong Kong (Lee et al. 2017), for feminist protests at universities in California and Minnesota (Crossley, 2015) or student protests in the United Kingdom over increases in university fees (Hensby, 2011).

1.2 Facebook

It is not strange to find Facebook as the most used tool in education or as the most mentioned in surveys about social networks in education.

Alvarado et al. (2019) mention that social networks are significant in formal education since they have a positive impact on group interactions, with the possibility of generating safe virtual environments, where through various multimedia tools (audios, videos, texts, images, among others) the role of content producer in the participants is enhanced. It is perhaps for this that various studies consider the use of social networks in the educational field.

According to Šebo and Hašková (2020), in 2014, in the United States of America, 71% of adolescents reported using Facebook, while in 2018 it dropped to 51%. Even so, these authors affirm that Facebook continues to be an environment known for Students despite not being an educational environment where they can move naturally, which has advantages when considered a support tool in school.

In Colombia Aldaz (2019) carried out an engagement analysis in five universities in the country in which he analyzed the time, the type of media, the number of words, the type of content, and interactions. He found that the publications that generate the highest engagement are related to the number of words, the types of media, and the number of rewards (like). In another study, Negrete-Rodríguez and Saucedo-Ramos (2020) aimed to know the perception of mastery and uses students give to the social network Facebook. They concluded that it is a tool principally used as a secondary activity while they carry out school activities, and among the activities they carry out within the network are leisure, academic demands, and labor issues.

But it is not only about students and the use they give to Facebook; in Peru, Fajardo and her colleagues (2019) carried out a study to evaluate the effects of a training program on the social network Facebook for university teachers, concluding that the connectivity, the communication, and the effectiveness offered by this social network are a valuable contribution to the interaction of the university community, since it makes it possible to link the academic interest of the teaching staff with the student's learning.

Currently, Facebook has consolidated itself due to its use and number of subscribers, but also due to the financing it receives. For example, the UNESCO Global Political Network has focused its digital philanthrocapitalism on education on platforms such as Google, Facebook, and Microsoft (Saura, 2020), which has favored its growth and use in the educational field.

However, not everything is favorable in using Facebook as an educational platform, given that it has had various problems in its history, particularly related to its users' sale of information to other companies or organizations. In 2013, Facebook was accused of being part of the PRISM project, which was a surveillance project by the United States government through the National Security Agency (NSA) that, apparently, accessed user data of companies such as Google, Apple and Facebook (Ball & Rushe, 2013). The above was a wake-up call regarding the possibility that users' data was breached with Facebook's knowledge. Later, in 2018, Facebook was accused of giving access to the personal data of 87 million users to the company Cambridge Analytica without their consent (Rehman, 2019). From this, the founder Mark Zuckerberg accepted that it was an abuse of trust by Facebook towards the people who share their data with the social network, which should be protected, and that he would take precautions going forward (Salinas, 2018).

Taking the above into account, some researchers have taken on the task of evaluating users' perceptions of Facebook,

especially after this pair of scandals mentioned above. An example of this is the work of Brown (2020) who, through interviews with ten university students between 18 and 29 years old, explored the decisions to stay or leave Facebook after the Cambridge Analytica case regarding the perception of privacy. She found that this event did not cause any respondents to leave Facebook permanently, although only one did so temporarily and reactivated his account a few months later. More than half of respondents were not surprised by the Cambridge Analytica story, matching their impression of how they used their data. One of the conclusions is that privacy problems worry users, but it has become normalized; however, the frequency of use has decreased since the scandal in favor of other social networks they trust better. In another study, Hinds et al. (2020) interviewed ten men and 20 women between 18 and 45 years of age, to know their understanding of privacy on Facebook and determine the way they interact with the social network. They found low levels of understanding about the implications of their online interactions as well as privacy. Apparently, users did not understand how the company Cambridge Analytica used people's data. Although they did express concern about how organizations may use their data in the future, they mentioned being immune to being influenced by targeted advertising, as happened in that scandal. After the event related to Cambridge Analytica, some participants considered closing their accounts, but few did so, and those who did returned to the social network later.

According to Srinivasan (2019), Facebook made misleading statements for a decade to induce users to trust the social network over other alternatives, promising not to monitor or misuse user data. Facebook executives even expressed intentions to improve privacy levels, increasing trust and reducing perceived risk; however, because of the scandals mentioned above, confidence is undermined in some contexts. In addition to the problems of selling user data, Facebook has also been pointed out as a company that seeks to monopolize social networks (Arora & Zinolabedini, 2019), stating that the owner of Facebook has sought to destroy the competition. Such an amount of data protected by Facebook can become a weapon to favor particular interests.

1.3 Disciplinary Social Networks (Disciplinary SN)

In a current panorama, the most used social networks, such as Facebook, continue to contribute to a feeling of uncertainty as well with Twitter (now called X), which was acquired during the year 2022 by billionaire Elon Musk, bringing with it changes and updates decided by himself, the new name included. Even the acquisition alone brought changes, Benton et al. (2022) state that hate speech increased in days close to the acquisition of Twitter by Ellon Musk, especially in October and November, since users considered that the change of owner would imply a reduction in penalties for the use of this type of speech. Jikeli and Soemer (2022) state that conversations about Jews increased significantly in a period close to the change of ownership of Twitter, where the average number of daily conversations about Jews doubled.

Given the panorama of social networks such as Facebook and Twitter, it is worth asking: What other scenarios are possible to integrate social networks in the educational field?

In this spectrum of possibilities, open-source social networks emerge, which are social networks that can be installed on a physical server or in the cloud and have their code of conduct, terms of use, and moderation guidelines. In turn, these social networks can connect with other networks, thus generating a network of networks or a network of “instances”. Due to their characteristics of not belonging to a centralized node, these networks are called federated social networks and belong to a set of networks called “Fediverse,” a conjunction of the words Federation and Universe.

The most used federated social network currently is Mastodon (https://joinmastodon.org/), which has had a great boom since the purchase of Twitter by Elon Musk. According to Stokel-Walker (2022), Mastodon seems more intimate and encourages conversation since the instances respond to specific thematic organizations, encouraging people to group in instances with common interests. Authors such as La Cava et al. (2022) affirm that, currently, Mastodon and the networks that it has generated over approximately six years of existence have reached a balance where some instances appear and disappear, along with users

who register themselves in some of them and then stop using the accounts, while the most prestigious and well-known instances are firmly established with a constant user quota. Despite this, instances of Mastodon can be found for different purposes, for example, to talk about music, film, anime, or science.

Returning to the above, when a social network is used to discuss a specific area of knowledge, it's called a Disciplinary Social Network (hereinafter Disciplinary SN) (Meza et al., 2022).

In the academic field, the Disciplinary SN has proven to be a favorable environment for interaction and the exchange of information between students and professors in psychology, where they have managed to discuss and debate academic topics, respecting the code of conduct and their terms of use, having the peace of mind that their data is protected and managed by the same teachers who use the network (Meza et al., 2022).

Taking into account that Disciplinary SN is a scenario that shows being conducive to interaction between students and teachers, it is necessary to review the way its acceptance can be evaluated based on users' perceptions. In this sense, the Technology Acceptance Model (TAM) is quite convenient.

1.4 Technology Acceptance Model (TAM)

Davis (1989) proposes the Technology Acceptance Model, which evaluates the acceptance of technology based on its intention to use, perceived usefulness, and ease of use. This model has been used in various investigations on how people perceive the use and acceptance of novel technologies. The above is the case of Cañarte (2021), who examined how teachers accepted the Information and Communication Technologies usage in their educational practice. She concluded that the perceived risk exerts a negative and significant influence on the perceived usefulness of university teachers, that is, relevant to the value of ICT as helpful to think about its use.

Based on Davis's original TAM model, authors such as Belanche et al. (2012) added other elements, such as the perceived trust of social networks used by governments to communicate with citizens. They found that trust is affected by perceived ease of use and directly affects perceived usefulness, confirming that the inclusion of trust in the TAM model is relevant in the context of technology that includes the Internet, that is, to the extent as citizens perceive that the use of online services does not involve any effort, their favorable attitude, their perceived usefulness, as well as their trust increase.

The study by Sánchez-Franco et al. (2017) assessed the perceptions of young adult users of social networks using the TAM model, including the concepts of trust and perceived risk. They concluded that perceived ease of use and usefulness are related to enjoyment and are important motivational factors for the use of networks. Trust is closely related to privacy, as it determines the extent to which users feel comfortable sharing information on the Internet, especially those users who are not so familiar with these types of social sites. Something important is that the need to trust decreases as familiarity and experience in social networks increase, favoring easy and satisfactory interactions.

As has been seen, the TAM model helps assess the acceptance of technology and has been integrated into the Internet tools' evaluation as a means of interaction, especially social networks. One of the main adaptations of the TAM model is the proposal by Lorenzo et al. (2011), where they include the original dimensions: intention to use, perceived usefulness, and ease of use; they also add trust and perceived risk specifically for social networks. Based on this proposal, they created an evaluation instrument that allows us to investigate how people evaluate and accept the use of social networks. An example of this application is the work of Peña & Sánchez (2017), who piloted a social network tool that allows the interaction, continuous evaluation, and interpretation of data generated in social networks integrated into online teaching platforms. Based on open interviews and the questionnaire proposed by Lorenzo et al. (2011), applied to 29 university students, found that the attitude toward using the Twitter social network was favorable along with using intention for online teaching processes, identifying a high perception of risk and low confidence for the use of the social networks, but with a favorable general evaluation for their inclusion in the

educational field.

Previous to the present research, Meza and Gonzalez (2022) applied the TAM instrument by Lorenzo et al. (2011) to 74 psychology students in the online distance modality, where the majority were women with an average age of 35 years and belonging to different areas of Mexico. They found that the instrument showed good reliability indices using Cronbach's Alpha, with all scales above 0.67. They asked participants what social network they use the most, and found that Facebook is the most used. High means were obtained in Ease of use, Intention to use, Perceived usefulness, and Attitude towards social networks, all of them above M=3.76 on a Likert scale from 1 = Totally disagree, to 5 = Totally agree; while Perceived Risk was considered medium (M=2.79), and Trust was also considered with a medium score (M=2.67). However, it was striking that there was an inverse relationship between age and the perception of Ease of use, in addition to a greater perceived Risk in women and a lower Perceived usefulness in those Facebook users, the differences being statistically significant.

With the background shown so far, we believe it is relevant to assess the use of a Disciplinary Social Network using the TAM model with the elements of trust and perceived risk proposed by Lorenzo et al. (2011), so our research objective is to evaluate the Attitude, Intention to Use, Perceived Usefulness, Ease of Use, Trust and Perceived Risk of a Disciplinary Social Network.

2. Methodology

Our present study is quantitative with a correlational, cross-sectional scope, with multiple measurements since we obtained the data once the students used the Disciplinary SN. Correlational studies aim to find if there are differences in the characteristics of a population depending on whether its subjects have been exposed to an event of interest or a variable. Meanwhile, the cross-sectional studies provide a snapshot of the outcome and the associated characteristics of the sample at a specific point in time (Lau, 2016).

2.1 Sample

The participating students used the Iztasocial Disciplinary SN (https://iztasocial.site) for curricular and non-curricular activities for at least one semester for their university academician training. This Disciplinary SN is based on Mastodon (https://joinmastodon.org/) and has appropriate terms of use for the academic field. The sample was non-probabilistic, for convenience, it was made up of 211 online Psychology degree students, 167 women (79.14%) and 44 men (20.85%) with a mean age of M=35.69 years (SD = 10.01), with a range of minimum 18 and maximum 61 years. They belonged to 21 of the 32 states of Mexico, the most frequent being the State of Mexico with 76 (36.01%), Mexico City with 63 (29.85%), Oaxaca with 11 (5.21%), and Puebla with 10 (4.73%).

2.2 Instruments

We used the Technology Acceptance Model Instrument (TAM) adapted and modified by Lorenzo et al. (2011), which uses items that refer to virtual social networks, adding scales on Trust (T) and Perceived Risk (PR). It uses a 5-point Likert scale with 1 = Totally disagree and 5 = Totally agree. For the present study, we only added the name of the Disciplinary SN, "Iztasocial," to refer to the Disciplinary SN used. For example, item 1 of the original Perceived Usefulness (PU) scale by Lorenzo et al. (2011) is: "I consider that the functions of social networks are useful for me", while the item we used in this research was "I consider that the functions of the Iztasocial social network were useful for me".

We also added informed consent to clarify to participants that all data were used for research purposes and that their data were anonymized, thus complying with the necessary ethical aspects. In total, the instrument consists of 52 items in seven scales: Use of social networks (US), Perceived Usefulness of social networks (PU), Ease of Use of social networks (EU), Attitude

towards social networks (A), Intention of Use of social networks (IU), Perceived Risk of social networks (PR) and Trust towards social networks (T).

2.3 Procedure

We adapted the TAM instrument to Google Forms. To obtain the reported number of students, we grouped the responses during two consecutive years of use of the Disciplinary SN Iztasocial, using this network for curricular and school activities throughout four consecutive semesters by 11 teachers, the use included: discussions on psychology topics, discussions on the psychologist's ethical code, such as a micro-blog, and the exhibition of posters and educational videos made by students, among others. At the end of each semester, teachers sent the Google Forms link, with the TAM instrument, to their students. The participants were informed about the conduct of this research and agreed to be part of the research through an informed consent document. We kept the participants' confidentiality by the ethical guidelines suggested by the institution.

From this, we obtained that in 2021, 125 students (59.24%) answered the questionnaire, and in 2022, 86 (40.75%) answered the questionnaire. Once we obtained the 211 responses, we downloaded them into a spreadsheet that we imported into the JASP v.0.16.3 statistical analysis software (https://jasp-stats.org/), with which we performed the statistical analyses.

3. Results

According to the modified TAM instrument, we obtained that 103 participants (48.81%) mentioned having used the Iztasocial Disciplinary SN less than once a week, 61 participants mentioned having done it at least once a week (28.91%), another 21 mentioned 2 or 3 times a week (9.95%), 13 indicated that they used it at least once a day (6.16%), 11 participants used it several times a week (5.21%), and 2 participants reported using the network several times a day (0.94%).

Regarding the hours they used the Iztasocial social network per week, 90 participants (42.65%) mentioned using it less than 1 hour a day, followed by 89 participants who reported using it between 1 and 5 hours per week (42.18%); on the other hand, 21 participants indicated using it between 5 and 10 hours (9.95%), 5 participants used it between 10 and 15 hours (2.37%), while the participants who mentioned using it between 15 and 20 hours, as well as between 20 and 25 hours and more than 25 hours had 2 participants in each option (0.94%).

To know the reliability of the TAM instrument, we used Cronbach's Alpha, obtaining the data in Table 2.

Table 2 - Shows Cronbach's alpha, mean, and standard deviation of each scale of the TAM instrument.

Scale	Cronbach's alpha	Mean	S.D.
Perceived Utility (PU)	0.85	4.33	0.79
Ease of Use (EU)	0.94	4.43	0.71
Attitude (A)	0.93	4.68	0.65
Intent to Use (IU)	0.92	4.43	0.83
Perceived Risk (PR)	0.80	1.17	0.30
Trust (T)	0.87	4.56	0.50

Source: Own work based on the research results.

All the scales we obtained had a high Cronbach's Alpha coefficient, with EU being the scale with the highest coefficient (alpha=0.94) and PR being the scale with the lowest coefficient, still being quite reliable (alpha=0.80). Therefore, we stated that the scales of the modified TAM instrument were reliable. Most of the means per scale were located in a high score since it is a Likert scale from 1 to 5, so A was the scale with the highest mean M=4.68, SD=0.65, while PR was the scale with the lowest mean M=1.17, SD=0.30.

We used normality tests Kolmogorov-Smirnov, and we found that all the scales: PU, EU, A, IU, PR, and T obtained a value of $p<0.001$, so it is non-normal data; therefore, we decided to employ non-parametric statistics for subsequent analyses. To determine if there were statistically significant differences according to gender, we created Table 3.

Table 3 - Means and standard deviation of each scale of the TAM instrument according to gender.

Scale	Gender	N	Mean	S.D
Perceived Utility (PU)	Man	44	4.05	1.06
	Women	167	4.43	0.69
Ease of Use (EU)	Man	44	4.25	1.00
	Women	167	4.47	0.61
Attitude (A)**	Man	44	4.45	0.93
	Women	167	4.73	0.54
Intent to Use (IU)	Man	44	4.26	1.05
	Women	167	4.49	0.75
Perceived Risk (PR)	Man	44	1.23	0.36
	Women	167	1.15	0.27
Trust (T)	Man	44	4.41	0.81
	Women	167	4.60	0.37

Note: **p<0.01. Source: Own work based on the research results.

Due to the lack of normal data, we used the Mann Whitney U test for differences between independent groups. We found statistically significant differences between men (M=4.45) and women (M=4.73) on A scale, favorable for women ($U=2817$, $p<0.001$). Continuing with the non-parametric tests, we performed correlations between the instrument scales using Spearman's Rho test (see Table 4).

Table 4 - Spearman's Rho correlations using the scales of the TAM instrument.

Variable 1	Variable 2	Rho value
Perceived Utility (PU)	Ease of Use (EU)	0.43***
Perceived Utility (PU)	Attitude (A)	0.66***
Perceived Utility (PU)	Intent to Use (IU)	0.60***
Perceived Utility (PU)	Trust (T)	0.35***
Ease of Use (EU)	Attitude (A)	0.47***
Ease of Use (EU)	Intent to Use (IU)	0.40***
Ease of Use (EU)	Perceived Risk (PR)	-0.38***
Intent to Use (IU)	Attitude (A)	0.63***
Intent to Use (IU)	Trust (T)	0.41***
Age	Ease of Use (EU)	-0.20**

Note: **p<0.01, p<0.001***. Source: Own work based on the research results.

The PU, EU, and IU scales showed correlations with other variables of the TAM model, the highest being the correlation between PU and A (Rho=0.66, p<0.001), while we found a negative correlation between the EU and A scales (Rho=-0.38, p<0.001). The Age and FU showed a weak and negative but statistically significant correlation (Rho= -.20, p<0.01).

To compare the results we obtained from this research using a modified TAM instrument, we returned to previous results reported (Meza and González, 2022), where they applied the same instrument to a similar population but asked the participants about the commonly used social networks, as Facebook. From this comparison, we made Table 5.

Table 5 - Shows the means obtained by scale compared with what was reported by Meza and González (2022).

Scale	Iztasocial Disciplinary Social Network		Meza and González (2022)- Common social networks (Facebook)		Difference between the means
	Mean	S.D.	Mean	S.D.	
Perceived Utility (PU)	4.33	0.79	3.76	0.17	0.57
Ease of Use (EU)	4.43	0.71	4.21	0.64	0.22
Attitude (A)	4.68	0.65	3.93	0.72	0.75
Intent to Use (IU)	4.43	0.83	4.15	0.77	0.28
Perceived Risk (PR)	1.17	0.30	2.79	0.68	-1.62
Trust (T)	4.56	0.50	2.67	0.65	1.89

Source: Own work based on the research results with data from Meza and González (2022).

As noted, the means differ significantly in the scales of the modified TAM instrument according to the type of social networks used by the participants; however, in all of them we noticed a favorable difference for the Disciplinary SN Iztasocial use. This difference is wider in scale T with 1.89 points of difference, followed by PR with -1.62, this being the only scale in which the previous results (Meza & González, 2022) show a higher mean because, in social networks such as Facebook, the participants perceived a higher risk. It is relevant to remember that this is a Likert scale from 1 to 5 where, as the score increased, the perceived risk increased.

4. Discussion

The objective of our research was to evaluate the Intention to Use, Perceived Usefulness, Ease of Use, Trust, and Perceived Risk of a Disciplinary Social Network, which we achieved by applying the TAM instrument modified by Lorenzo et al. (2011) adapted to the Iztasocial Disciplinary SN.

First, we want to highlight the high values of Cronbach's alpha on each scale, which places the instrument as a reliable means of evaluating digital social networks, additionally being adaptable to several application contexts. Other authors (Peña & Sánchez, 2017; Meza & González, 2022) had already used it, reporting high-reliability rates, so we decided to use this instrument.

The next thing we want to point out is the ceiling effect that all the scales of the TAM instrument presented, except for the floor effect that the PR scale showed. The above, from a statistical point of view, excludes the data from being analyzed using parametric statistics since it is non-normal data; however, for evaluating the Disciplinary SN Iztasocial has been favorable since the majority of participants perceived it as easy to use, reliable, safe, and they reported their intention to use it continuously. One of the reasons why this phenomenon could have happened is the participation of teachers in the Disciplinary SN, since it is a network with an academic emphasis, so the use aim is evident from the beginning, which allows carrying the community's activity towards a common objective (Liccardi et al. 2007). This speaks of the balance between intimate work areas in which members can collaborate on a specific task, but also on a mutual and larger task, within a community, achieving the challenge of having a space for exchange within the community, which authors have mentioned using means of interaction such as

discussion forums (Barab et al., 2004), which now is possible to carry out through social networks.

Another important aspect to highlight is the instance moderation, which is different from the most common social networks such as Facebook and Twitter because this aspect of the Disciplinary SN Iztasocial is carried out by the teachers, who also participated in developing the terms of use. Due to the above, users can report unwanted behavior, and teachers can take action on this behavior, such as deleting the publication or even expelling the offending student. The above has been a particularly novel and favorable point for maintaining self-governing instances (Caelin, 2022), which promotes the creation of virtual learning communities since it generates a perception of trust and security.

Regarding trust in social networks, authors such as Maqableh et al. (2021) state that satisfaction is more significant than trust in the continuous use of digital social networks, which could be because users value perceived gain more than trust in the network. The above is significant due to the social value given to a social network that may not generate a perception of trust, as reported about Facebook in 2022 (Meza & González, 2022). However, users will continue using it, despite perceiving some risk. The above does not happen in the Disciplinary SN Iztasocial since we find high levels of T, PU, and low levels of PR, so it is expected that teachers and students view it as a safe environment to share and discuss psychology, which could generate loyalty to the Disciplinary SN and favor long-term interaction (Maqableh et al., 2021).

The correlations that we found within the dimensions of the modified TAM instrument confirm what Lorenzo et al. (2011) reported about how the instrument dimensions showed statistically significant correlations with each other, particularly PU with A, PU with UI, and UI with A, forming a relevant conceptual triad between them. The previous can favor designers of academic experiences in Disciplinary SN, such as Iztasocial. Knowing that this environment favors high levels of UI can attract high levels of A and PU. Something important to note is the negative, although weak, relationship between EU and PR, which implies that as there is a higher perception of EU, the PR decreases and vice versa. The above is a finding not reported by authors that previously used the modified TAM instrument with the T and PR scales. In these studies, the PR is medium-low since Peña and Sánchez (2017) reported an average of M=2.03, while Meza and González (2022) reported M=2.79, both investigations when talking about social networks usually used such as Facebook but when using the Iztasocial Disciplinary SN, the mean PR was M=1.17, the lowest value reported till now. In addition to the above, no statistically significant differences were found in PR between men and women, contrary to previous finding (Meza & González, 2022), where women reported perceiving greater risk than men in the most used social networks. This low PR seems to help, in a slight way, to a better perception of EU in the case of the Iztasocial Disciplinary SN.

To establish a comparison, we return to the Meza and González work (2022) where they used the same modified TAM instrument with the PR and T scales (Lorenzo et al., 2011) in a sample of participants with similar characteristics. The main finding was the means of the scales since, in the case of our present research, all the dimensions of the TAM instrument favor the use of the Iztasocial Disciplinary SN, compared to the use of the most commonly used social networks such as Facebook, being the T scale the main difference, where it almost reaches a difference of two points. We can attribute part of this trust to the moderation of the instance, as already mentioned, but also to the participation of the teachers who are an active part of the network and its self-governance. Another important aspect in favor of trust in the network is the ethical use of data since the terms of use explicitly mention that the participants' data of the Disciplinary SN Iztasocial are protected and will not be marketed to companies or third parties. This data can only be used for research or teaching purposes, being completely anonymous. We could suggest that these three elements (moderation, teaching figures, and ethical use of data) generate an environment of trust where students report feeling safe.

By using federated social networks as disciplinary social networks (Disciplinary SN) through which learning communities can be created, students and teachers can be part of the decision-making, moderation, and social climate promoted within the institution, which allows citizens to be responsible for what they want and do not want to see on the social networks

they use daily. We consider that this empowers the network users themselves in scenarios where their voice is heard, unlike those of the most commonly used social networks, because as authors such as Brown (2020) state, it is necessary for governments and associations of Consumers to join forces to defend social media users, even reaching legislative stages. Brown's statements on the knowledge and exclusive use of social networks belonging to corporations such as Facebook or Twitter; however, he is unaware of other options to interact through social networks on the Internet. Therefore, our project has shown that other possibilities exist.

5. Final Considerations

Nonetheless, our study has its limitations; one is the number of participants who use the Iztasocial Disciplinary SN infrequently, which is a high percentage of the sample, so the responses should be taken with discretion. Also, when using the Disciplinary SN during the curricular activities necessary to accredit a course and obtain a grade, it is possible that there was social desirability in the responses of the instrument; however, one way to continue investigating how students and teachers use the Disciplinary SN is perform content analysis of what is published in it, as well as historical monitoring of the number of users who remain active and investigate the reasons why some users stop using it.

In conclusion, the social networks belonging to the fediverse allow the creation of Disciplinary SNs that make possible the interaction between communities that discuss specific topics of interest to their members. These types of networks are safe, reliable environments with a high perception of ease of use, which is why we invite researchers to continue the inquiry into the use of these types of networks in addition to carrying out greater dissemination on the possibilities they offer. Our suggestions for future research are to conduct in-depth interviews to inquire into the perception of the participants about the variables mentioned as Perceived Risk and Trust to know which elements favor this perception of security, in addition to continuing with the comparisons of other psychological variables that can promote the use of Disciplinary SN in the educational environment, compared to commonly used social networks such as Facebook.

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