R.A.N. Vol. 9 (1) 2023
ran.udec.cl
Artículo de Investigación

A collaborative learning platform for corporate training of Small and Medium Enterprises: a tool for increasing company productivity

Plataforma de aprendizaje colaborativa para la formación corporativa de Pequeñas y Medianas Empresas: una herramienta para aumentar la productividad de la empresa

Anabelem Soberanes Martin[1*]
Universidad Autónoma del Estado de México
asoberanesm@uaemex.mx

Magally Martínez Reyes[1]
Universidad Autónoma del Estado de México
mmartinezr@uaemex.mx

* *Autor corresponsal.*

1 Universidad Autónoma del Estado de México, Centro Universitario UAEM Valle de Chalco, Av Hermenegildo Galeana 3, Santiago, 56615 Valle de Chalco Solidaridad, Estado de México, MEXICO.

Abstract

Purpose: To present a learning community for management skills, which allows different levels of users (expert, novice, and interested) to self-learn through various tools, the materials are presented for different learning styles.

Design/Methodology: The research approach was mixed (qualitative and quantitative), cross-sectional, and field-based to characterize users and their needs. The platform was developed with an educational software engineering methodology.

Results: The design of this type of platform encourages critical reflection on practical cases present in the company and generates the social and collaborative construction of learning. The results of its implementation measure the usefulness and ease of use of the Technology Acceptance Model (TAM).

Originality: A learning community for training staff in small and medium-sized enterprises (SMEs) is presented because some learning management systems (LMS) are expensive and too general.

ARTICLE INFO
Received: 25 November 2022
Accepted: 27 December 2022

Keywords:
Learning community
Self-learning
Learning Management System
Management skills
Technology Acceptance Model

ISSN: 0719-7713 / 0719-6245
https://doi.org/10.29393/RAN9-9CLAM20009

Resumen

Propósito: Presentar una comunidad de aprendizaje para habilidades directivas, que permite a diferentes niveles de usuarios (expertos, novatos e interesados) auto aprender mediante diversas herramientas, los materiales son presentados para diferentes estilos de aprendizaje.

Diseño/Metodología: El enfoque de la investigación fue mixto (cualitativo y cuantitativo), transversal y de campo para caracterizar a los usuarios y sus necesidades. La plataforma fue desarrollada con una metodología de ingeniería de software educativo.

Resultados: El diseño de este tipo de plataforma incentiva la reflexión crítica de casos prácticos presentes en la empresa y genera la construcción social y colaborativa del aprendizaje. Los resultados de su implementación miden la utilidad y facilidad de uso con el Modelo de Aceptación de la Tecnología (TAM).

Originalidad: Se presenta una comunidad de aprendizaje para formar personal en pequeñas y medianas empresas (PYMES), porque algunos sistemas de gestión del aprendizaje (LMS) son caros y generales.

INFORMACIÓN ARTÍCULO

Recibido: 25 de Noviembre 2022

Aceptado: 27 de Diciembre 2022

Palabras Claves:

Comunidad de aprendizaje

Autoaprendizaje

Sistema de gestión de aprendizaje

Habilidades directivas

Modelo de aceptación de la tecnología

INTRODUCTION

Companies require training to enable their human capital to carry out their activities properly, thus contributing to the organization's productivity. However, there is a dilemma about whether the training should be given in-house or outsourced. This study proposes a learning community for corporate training. Small and medium-sized enterprises (SMEs) were selected because they rarely have the resources to spend on training. A diagnosis was carried out to identify the requirements of SMEs in the service sector. Then, the issues to be addressed were determined and, subsequently, how the information would be presented, after which the learning community was created, and a pilot test was developed.

Educational institutions and corporate organizations widely adopt Learning Management System (LMS), which is software that enables different learning contents. The use of advanced LMSs helps educators combine and create centralized educational content to suit students' needs. According to Technavio's market research report (2018), benefits such as the facilitation of centralized learning will be one of the primary growth factors for the LMS market. Along with the changing needs of students, the demand for effective quality content also increases.

Studies such as the one published by eLearning Industry (2019) list the top 20 LMSs used by companies for training. The study uses a holistic approach based on the information from actual LMSs users; it considers three aspects: (1) System usability scale, the most used and validated metric to measure the usability of a system, object, device, or application. (2) Perceived utility is the degree to which a user feels that an LMS maximizes his or her work performance. (3) Net Promoter Score (NPS), the metric that quantifies on a scale of 1 to 10 the number of users who will or will not recommend the product. For example, if an SME wants to train its 500 employees, the average hiring cost is 50 per month / 400 per year, course enrolment is 100 per month / 1,000 per year, and the contract duration is two years.

The disjunctive for a company is to determine the cost-benefit of the investment; therefore, to determine the extent to which the investment in LMS training allows a capacity of absorption of knowledge resulting in fruitful or innovative employee performance at work.

The LMS that is the object of this survey is a response to the SMEs' corporate training needs. However, it is necessary to highlight some variables that should be considered in their choice.

The immediate variable is the cost because it is necessary to pay for annual membership besides an individual registration fee per employee. Another factor is that these systems designs are generic since they do not consider individual users' level of knowledge to place them on the proper path to promote learning in a shorter time.

Finally, part of human nature is the need for interaction with others, which is the primary source of knowledge acquisition. Generally, the most experienced person supports the new

apprentice with the technical knowledge that he or she needs to carry out a particular activity in a company. These elements are not incorporated in current LMS designs, as the information is limited to technical support, which cannot adapt to every user's need but rather a general process and activity standards.

This study proposes to create a learning community because, in addition to providing the services of the LMS (managing, distributing, and controlling the training activities of an organization), it also allows to incorporate of the level of experience of the users, defines differentiated learning paths and encourages communication among different users (experts, novices, stakeholders, and others) to facilitate collaborative learning.

The objective was to develop a self-learning community web platform that allows different levels of users to work collaboratively with the diverse tools and didactic materials that conform to it, incorporating social and collaborative construction of learning and opportunities for critical reflection through practical cases.

BACKGROUND

A brief review of the essential aspects of SMEs disclosed the importance of corporate training, and a learning community.

Small and medium-sized enterprises

Small and medium enterprises (SMEs) participate in various activities such as trade, services, industry, and independent work. Although there are various classifications, in this study we considered SME size as a classification parameter (Rodriguez, 2011):

- Micro: Less than ten workers.
- Small: Less than 50 workers.
- Medium: Between 50 and 200 workers.
- Large: More than 250 workers.

The importance of SMEs for a country relies on their contribution to the economy through the number of jobs generated and regional development which in turn are conceived as an effort to fight against poverty. A company at its startup must consider the average life of approximately 7.8 years; if during the first year, it survives, its life expectancy increases to 8.2 years. In the fifth year of life, the expectancy increases to 9.9 years, and at the end of its tenth year, 12.5 years (Cabrera *et al*., 2019).

Studies about the initial duration of companies show that there is a high percentage of closures. Navarrete and Sansores (2011) point out some factors such as the lack of business skills, limited production, and minimal use of information systems.

On the other hand, Alvarado (2016) identified that disorganization, insufficient financing, lack of technical knowledge, and commercial management of products or services are the causes of failure to meet long-term goals. The failure figures for SMEs are overwhelming, only 20% of every ten companies reach the second year of operations (Rodríguez, 2011). One of the main reasons for failure is the lack of knowledge of administrative processes, defined as a set of methods adopted by agencies to safeguard their resources, verify the accuracy of financial information, and promote operational efficiency and compliance with established policies (González, 2010).

The need for training allows SME management to reflect on productivity and permanence in the market. This proposal settles the basis to support the importance of promoting managerial skills in employee performance, as well as developing skills in motivation, conflict management, delegation, training and teamwork, effective communication, and decision-making.

Productivity is a crucial company and vital for the economy in general. The higher it is, the more production each person can generate using a given amount of information, ultimately driving higher living standards. Pappas (2019) says that IBM found that although e-learning was expensive, it led to substantial improvements in productivity. For every dollar spent, the company increased productivity by $30. IBM proved that productivity gains come from the ability of employees to apply their newly acquired skills immediately. Applying newly learned skills quickly is essential to any role.

No one expected a situation like the outbreak of coronavirus disease (COVID-19) that severely affected the world's economy; some of the main victims of COVID-19 were companies. For example, Shafi *et al.* (2020) point out that in Pakistan most

of the companies were severely affected and faced several problems, such as financial, supply chain disruption, decreased demand, and reduced sales and profits, among others. In addition, they point out that 83% of the companies were not prepared and had no plan to deal with such a situation. In addition, more than two-thirds of the participating companies stated that they would not be able to survive if the shutdown lasted more than two months.

Some SMEs are responding to the crisis by applying creativity to problems to obtain opportunities. However, it is resilience that let them see an opportunity out of the chaos and survive uncertain times (Thukral, 2021). In addition to the support provided by some governments to face the situation, there was a need for corporate training to meet company requirements.

Corporate training

According to Bouzas and Reyes (2019), training and education are constitutional rights in favor of workers to raise their standard of living and productivity. In particular, the following are objectives for worker's training and education:

1. To update and improve workers' knowledge and skills, and use of new technologies.
2. To prepare a worker to fill in a vacant or newly created position.
3. To prevent work risks.
4. To increase productivity.
5. To improve workers' skills as a whole.

However, training is a pending matter in developed countries mainly because training programs have been mostly improvised, as there is no record of results.

According to Cuesta (2017), management will lead the training cycle. The training process must be in including the organizational structure or the organizational chart as a part strategic planning summit and senior management. In a world with a need for permanent training, moving it away from top management is a severe strategic error. The beginning of this cycle is the "diagnosis of training needs" or "inventory of training needs" because its impact is strategic for any contemporary organization. The impact of training is strategic for any contemporary organization. Determining how training benefits business strategy and how it does so effectively is essential. These skills gap analyses should be individualized. In other words, each employee will have to be featured in his or her own "graphic profile of the labor skill gap" to receive differentiated training.

Cuesta (2017) points out that "graphic profiles of the labor skill gap" of the entire group of employees, considering the different strata of labor categories (workers, technicians, managers, etc.) or age, and sex, among other possibilities. The analysis of the design of the different training programs, the resources to be employed, and the training process forms, among others, undoubtedly take on a reasonably argued character. The elaboration of the training plan is essential and requires a detailed and strict "diagnosis of training needs" with which the training cycle begins.

Deloitte estimate that the average employee must spend about 1% of his weekly time on training because it helps any worker to keep up with the best practices and developments in their industry. One percent of the workweek is a small quantity of time. It translates to 24 minutes per week or 4.8 minutes per day, assuming a 5-day workweek. Organizing 4.8 minutes of training per day face-to-face would not be practical. Thus, microlearning can be even more effective than regular learning because people are better at absorbing small bits of information than larger ones (Pappas, 2019).

Business training is often approached as training for entrepreneurial intention. Al-Awlaqi *et al.* (2021) discussed the ability of entrepreneurship training to encourage individuals to start their businesses. This requires entrepreneurship-training programs, a fundamental tool to generate new and better entrepreneurs. Santana-Domínguez *et al.* (2022) proposed a theoretical model to maximize the usefulness of entrepreneurship training programs. Boubker *et al.* (2021) invited universities to offer entrepreneurship training modules to improve students' level of entrepreneurial intention.

Dalisova and Grishin (2019) pointed out that training for small and medium-sized enterprises should apply to entrepreneurs and employees. However, entrepreneurs prefer to hire already-trained specialists. Therefore, it is extremely important that not only managers but also the staff, in general, acquire modern professional skills in the field of business activities.

Learning Communities

The development of platforms for the promotion of learning communities is not new; experiences such as those of Díaz and Flecha (2010), Garcia *et al.* (2013), Racionero and Serradell (2005); and Torres and Gago (2014) have provided a glimpse of the potential of this technology to support collaborative and autonomous learning in infant, school, university, and adult education. It is always focused on a discipline such as English, mathematics, or computing or a particular subject (reading and writing, gender violence) or a specific purpose (teacher training). Learning communities involve all people who directly or indirectly influence the learning and development of those who interact, including teachers, ordinary people with no formal education interested in the subject, members of associations and organizations, professionals, experts, etc.

The authors emphasize the possibility of transforming schools into learning communities encouraging citizens' participation to improve their neighborhoods and towns to avoid segregation in the use of public space by people from different cultures as part of the strategies to include immigrants.

The European Economic Community Strategy 2020 prioritizes the development of essential competencies through education to construct citizenship that responds to the challenges posed by a knowledge-based society and economy. For this, they start from relevant examples within the European Union Research Framework Programmed, such as the learning community Includ-Ed (2008a) and the cluster LOGSE (Includ-Ed, 2008b) on social inclusion, which covered the period 2006-2011, showing data on the benefits of interaction and dialogue as opposed to segregation and classification provided by the learning community perspective (Garcia *et al.,* 2013).

An example of a learning community that includes a working platform is UnX, the first Latin American community of digital entrepreneurship that manages a platform to experiment and implement the learning community through MOOC (Massive Online Open Courses). In addition, it interacts with other sectoral and governmental initiatives: RedEmprendia of universities that promotes innovation and responsible entrepreneurship in Latin America or CEDERJ (University Center for Distance Education in Rio de Janeiro) to promote richer experiences from games and challenges (Torres & Gago, 2014).

Among its courses are Entrepreneurship and Development of Mobile Applications with App Inventor, Entrepreneurship Transversal Skills, Basic Digital Skills, Mythology for Entrepreneurs, English in a Thousand Words, STEMx Development by Augmented Reality, Mobile Applications and Design of STEMx Mobile Applications without the Need for Programming, and Social Entrepreneurship and Innovation. The proposal has evolved into Colmenia, a broader learning community platform beyond the MOOC typology.

Thus, the learning communities are an efficient, equitable, autonomous, and collaborative response to social and educational challenges that we are currently experiencing in this transition from the information society to the behavioral society. These heterogeneous groups with diverse cultures, religions, languages, ethnicity, gender, ways of life, and skill levels, among others, collaborate in a dialogical way to solve learning activities with the help of members of the same community. However, as with all computer-based proposals, they have an expiration date if we do not consider the current technological advances that make it possible to increase their potential for communication, follow-up, diversification of teaching materials, and others.

METHOD

The research focus was mixed, qualitative and quantitative, transversal, and field-based to characterize users and their needs that will become functional requirements in the platform's design and use of applied research. The quantitative approach will conceptualize reality from a theoretical perspective, which will allow analyzing human behavior objectively through the collection and processing of data (Rodriguez, 2020). Qualitative research is a means to obtain information about opinions social beliefs and values, which are not manifested spontaneously for various reasons (Rosado, 2018). Field research aims to characterize the platform's different users, from users with minimal or no knowledge to professionals working in the area, specialists, consultants, and researchers.

A recurrent topic was chosen for the training: management skills, so learning trajectories define this topic. Then, we designed a web platform using an educational software

engineering methodology (Salas, 2016) and a methodology for developing web systems (Subra & Vannieuwenhuyze, 2018; Pérez, 2011; Pressman, 2010). Finally, a survey was applied to find out about the usability and functionality of the platform.

Instruments

Four instruments were used; the first instrument was a semi-structured interview applied to 25 service SMEs (100% who were invited) about their training needs; the script was composed of 10 base questions.

The second instrument was the test to determine the learning style; for this purpose, the instrument used VAK (visual, auditory, and kinesthetic). This theory provides several types of instruments to determine the learning style, one of the selected ones was the one from O'Brien (1990). Because of the nature of the population, it consists of 36 items on a Likert scale (selecting a, b, or c). It is possible to quantify by employing specialized software such as SPSS (Statistical Package for the Social Science), which are general questions about tastes before someplace, choice of physical spaces, and sensations before colors, among others. A count of more than 30 points in either direction may prefer that sensory (visual, auditory, or kinesthetic) system VAK is responded to when you first enter the learning community.

The third instrument corresponds to a diagnostic evaluation consisting of 30 questions about management skills; the first ten correspond to basic questions, the next 10 to intermediate subjects, and the last advanced aspects.

The fourth instrument corresponds to the TAM (Technology Acceptance Model), formulated by Davis (1989). The model suggests that the attitude towards using an information technology system is based on two previous variables: perceived utility (PU) and perceived ease of use (PEOU), with six and five items, respectively. PU refers to the degree to which a person believes using a system can improve their performance on the job. PEOU indicates the extent to which a person believes that by using a specific system, he or she will make less effort to perform his or her tasks. Based on the TAM model, a Likert scale adapted by Davis (1989) was used, with seven levels or scales of importance: (1) Considerably possible, (2) absolutely possible, (3) little possible, (4) nothing, (5) little improbable, (6) absolutely improbable, (7) considerably improbable. The author reports that his model has a reliability of 0.98 for usability and 0.94 for ease of use. It is an instrument that has been employed and validated by several authors Moon and Kim (2001) empirically validated the TAM model for the www context. Hussain *et al.* in 2016 used it to assess users' intention to use and their acceptance of an interactive mobile map and further validate the TAM model. Also, Wu and Chen (2017) propose a unified model integrating the technology acceptance model (TAM), task fit technology (TTF) model, MOOCs features, and social motivation to investigate continuance intention to use MOOCs. In addition, Hidalgo *et al.* (2019) presented a storage solution proposed in the cloud and exposes the process of technological acceptance based on the results obtained through the TAM model.

Procedure

The methodology divides into two stages. First, Educational Software Engineering will analyze educational requirements and characterize the population through documentary and field research (user interviews). In the second stage, a methodology for developing the platform must be applied, in addition to using applied research. The stages, techniques, and procedures considered are:

1. To select the topics on management skills to be included in the platform.
2. Documentary, field, and exploratory research to gather information about the learning communities in different contexts and topics.
3. To characterize the type of Learning Community by describing educational and technological needs relevant to the platform design through educational software engineering.
4. To select and develop didactic materials to present the contents considering depth and gradualness according to the characterization of the platform users.
5. To design a collaborative platform for the learning community in management skills.
6. To develop the collaborative platform.
7. To run a functional test of the platform to check its usability, utility, and completeness around management skills, verifying that it

contains all the features proposed by the pedagogical model associated with these learning community platforms.

8. To apply the TAM instrument after the analysis through the Excel software. A table of frequencies to obtain and analyze the trend of the user's acceptance of the learning community.

Participants

A convenience sample was used in the initial diagnosis to determine the training needs. Personnel from 25 companies participated, one from each (in 16 cases, the general manager and in nine the Human resources managers), of which 15 were medium and 10 small companies, all from the service area.

In the community test, 10 SMEs participated divided as follows: 6 people from small enterprises (two from each) and 24 people from medium-sized enterprises (3 or 4 from each, that was determined by the company).

RESULTS

The use of the platform follows the actions described below: the user logs in by punching in their username and password.

Figure 1. Main community screen (in Spanish). *Source: own elaboration.*

The main options that the platform has are objectives, training, dissemination, and contact. When entering the training section, the first time, do what is indicated in figure 2, the test on the learning channel (VAK). Then the diagnostic evaluation and with these two results, the information presented according to the learning channel (in the form of audiovisual, audio, or reading) and the level of knowledge of the subject (basic, intermediate, or advanced), the main menu of the course is shown in figure 3. Each level divides into 2 or 3 topics, for example, the Basic Module: (1) Emotional Intelligence and (2) Communication; the Intermediate Module: (1) Leadership and (2) Motivation; and Advanced Module: (1) Problem Analysis and Decision Making; (2) Negotiation Skills.

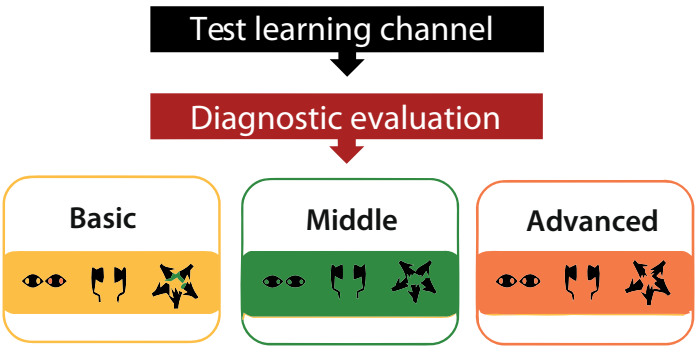

Figure 2. The main flow of community. *Source: own elaboration.*

To present the information, the learning model proposed by Whetten and Cameron (2017) consists of four steps:

1. Presentation of the behavioral principles or action guidelines, usually using traditional methods of instruction.
2. Demonstration of the principles through cases, films, scripts, or incidents.
3. Opportunities to practice the principles through role-plays or exercises.
4. Feedback on performance from peers, instructors, or experts.

Once the platform presents the content, according to the learning channel, it can be videos, podcasts, case readings, analyses, and multimedia presentations, among others. First, the user must review them and request the topic questionnaire (which is presented randomly and can be multiple choice, column relation, or short answer); when obtaining a score higher than 70, he can continue with the next topic. If not, he must review the topic again (he can do it the same way or choose another way to present the materials) and other additional resources.

The user may skip part of the content and continue to the next; the information is a proposal. However, it adapts to the needs of the organization. The test results of the 30 participants according to their learning style are: six are auditory, nine are visual, and 15 are kinesthetic (see figure 3)

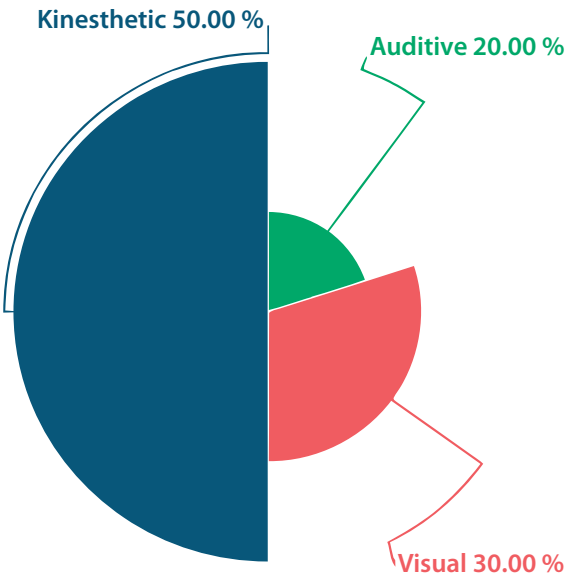

Figure 3. Participants' Learning Styles. *Source: own elaboration.*

The diagnostic evaluation results are 15 people identified as having basic knowledge, nine as having intermediate knowledge, and six as having advanced knowledge of management skills (see Figure 4).

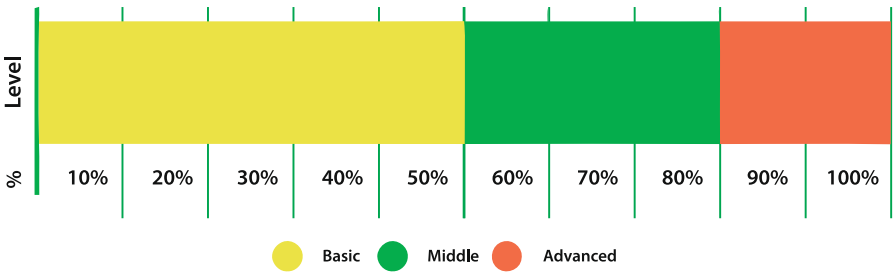

Figure 4. Participants' level of knowledge. *Source: own elaboration.*

Concerning the TAM, the results for every 11 items are shown in Tables 1 and 2. Each of the reagents described below, Perceived utility (PU):

1. Using the learning platform would help me to do my tasks faster.
2. Using the learning platform would improve my job performance.
3. Using the learning platform would increase my productivity.
4. Using the learning platform would increase my effectiveness in my job.
5. Using the learning platform would make it easier to perform my tasks.
6. I would find a helpful learning platform in my job.

The items in the Perceived Ease of Use (PEOU):

7. Learning to use the learning platform.
8. My interaction with the learning platform would be.
9. I find the learning platform flexible to interact.
10. It would be easy for me to become an expert in the learning platform.
11. I find the learning platform easy to use.

Table 1. Response percentages for each item in the TAM questionnaire (Perceived Usefulness)

Levels or scales of importance	Perceived Usefulness (PU)					
	item 1	item 2	item 3	item 4	item 5	item 6
Considerably possible	33.33	53.33	33.33	36.66	40.00	46.67
Absolutely possible	46.67	40.00	53.33	53.33	36.66	40.00
Little possible	13.33	6.67	10.00	10.00	16.67	6.67
Nothing	-	-	3.33	-	-	-
Little improbable	6.67	-	-	-	3.33	6.67
Absolutely improbable	-	-	-	-	-	-
Considerably improbable	-	-	-	-	3.33	-

Source: Own elaboration.

Table 2. Response percentages for each item in the TAM questionnaire (Perceived Ease of Use)

Levels or scales of importance	Perceived Ease of Use (PEOU)				
	item 7	item 8	item 9	item 10	item 11
Considerably possible	53.33	33.33	43.33	46.67	40.00
Absolutely possible	43.33	53.33	53.33	50.00	60.00
Little possible	3.33	10.00	3.33	3.33	-
Nothing	-	-	-	-	-
Little improbable	-	3.33	-	-	-
Absolutely improbable	-	-	-	-	-
Considerably improbable	-	-	-	-	-

Source: Own elaboration.

According to the data shown in Tables 1 and 2, it is possible to identify that the percentages are distributed heterogeneously within each item. However, the highest percentage is concentrated on a scale of appreciation of possible. Item 3 evaluates the use of the learning platform to increase the effectiveness of academic work. Moreover, item 8, student interaction with it, tends to be high.

It is concluded that the users' perception stands out on the PU dimension, the participants point out that using the learning platform would increase their productivity; and regarding the FUP dimension, they mention that their interactions with the learning platform are clear and understandable. An aspect with a very low percentage is about using the learning platform to facilitate the completion of their tasks.

TAM results indicate that more than 80% agree with the proposed e-learning platform for SME training. Comparing the TAM applied in other studies: Hidalgo *et al.* (2019) report on Perceived Ease of Use and Perceived Usefulness where more than 60% of users have stated that they agree with the use of the Nextcloud platform and the ease provided to users. On the other hand, Puello *et al.* (2020) point out regarding Perceived Usefulness, more than 50% of the respondents expressed a positive position regarding the usefulness of the prototypes. Regarding Perceived Ease of Use, more than 80% of the respondents indicated that individually and in groups, they will need help to use the IoT-based physics lab III. In all three cases, it is possible to identify an adequate level of acceptance of the proposed emerging technology.

DISCUSSION

The users' opinion confirms the importance of training for the SMEs in the study. Therefore, future studies should not only expand the scope of research to develop reliable measurements of training evaluation but also collect additional qualitative information by a case study approach.

As part of the proposal for interaction between business and academia, the study by Gurău *et al.* (2012) identifies three forms of academic entrepreneurship: (1) Founder-manager of an entrepreneurial company, (2) Project manager in an existing company, and (3) Scientific advisor to the board of directors of one or more companies. The case we present corresponds to the third type, where researchers can contribute with proposals to improve business-training systems within the paradigm of Educational Software Engineering.

The results of the test confirm what Castillo *et al.* (2016) have said: a diagnosis of learning styles allows students to be aware of their training process and to make decisions independent of the curriculum that allows them to enhance their learning responsibly. This is through planning learning routes, strategies, times, subjects, and materials, among others, that lead to the acquisition of new knowledge. Besides, a user with critical thinking can decrease the time to acquire the learning path that allows him to increase his knowledge and apply it in productive activities, improving and innovating processes, as mentioned by Nieto and Quevedo (2005).

The opinions of the interviewees confirm what O'Brien *et al.* (2019) expressed: the specific needs of SMEs must be identified, adapted to

the company and its challenges, immediately applicable, fostering a learning culture, addressing knowledge gaps, continuous, developing communication, teamwork, problem-solving and technical skills.

The covid-19 pandemic came to modify the operation of the companies, mixed work was adopted, and training needs increased (Colina-Ysea *et al.,* 2021): the proposal is an excellent option to contribute to this situation.

The qualitative information gathered from the interviews first allows us to propose an educational platform design according to the real needs of a very particular type of user, differentiating learning channel and user level, and incorporating real information on the type of problems that an SME faces. And, secondly, the quantitative information extracted from the standardized instruments allows for analyzing the platform's effectiveness and the users' objective opinions.

The user's control over the follow-up of the information stands out since if he/she does not consider a topic relevant, he/she can omit it, so in FPE, the interaction is viable and flexible, as well as easy to learn to use. The relevance of the information in their daily work in the company is useful and gradually impacts them to make their work more agile and productive.

CONCLUSION

The use of a commercial LMS is a good alternative for business training. However, in some cases, such as the SMEs in this study, they are inappropriate due to two main aspects: economic issues (monthly income from the LMS) and enrolment per person, as well as the fact that sometimes employees do not use it because they do not have time. Therefore, the training option requires a very excellent modality, not contemplated in the service provided by the general LMS, which is where the learning communities have a place as a different training option.

The qualitative information gathered from the interviews allowed the design of a platform according to the needs of SME users, in addition to identifying their learning style and level of knowledge to present content in a diversified way. The quantitative information provided by the standardized instruments made it possible to assess the functionality and usability of the platform. Therefore, the mixed methodology allows for influencing the design and functional evaluation of the platform, as required by educational software engineering. This proposal is relevant at a time when the Covid-19 pandemic has modified the ways of working.

The platform's versatility in the learning community environment identifies a user's level of knowledge after answering the diagnostic evaluation and choosing a learning style, thus customizing his/her learning path. With these two results, the information is presented according to the learning style (audiovisual, multimedia, audio, or reading only) and the user's level of knowledge level (basic, intermediate, or advanced).

An additional contribution is that the didactic materials are diversified (videos, podcasts, readings, case study analysis, multimedia presentations, film extracts, etc. This promotes critical reflection and the acquisition of helpful knowledge for work performance.

The proposed platform for learning communities meets the characteristics established by Tobón (2013), which are (i) analysis and problem-solving in teams, (ii) everyone learns from everyone through interaction, (iii) there is a complement of competencies, (iv) resources and communication spaces are provided, (v) there are shared learning interests and (vi) thinking skills develop.

Also, the learning community meets the requirements of the diversity of users and needs:

1. The inclusion of specific communication tools
2. Didactics means at a different level
3. Diversified educational strategies
4. Contents for dissemination and specialized technical development, as shown by many features for management skills.

The quantitative information extracted from the standardized instruments allows us to analyze the use and usefulness of the platform; it highlights the user's control over the monitoring of the information, the viable and flexible interaction, and the utility of the platform at work versus more agile and productive.

Among future work, it is possible to consider what was expressed in the diagnostic interviews, it is requested to have applications to train the new personnel hired on their functions, without the need for someone from the company to stop their activities for the training or induction of the new member. Self-learning and interaction in learning communities reduce training time through customized learning paths. An additional option will be to provide content material in several languages, if not at least in English.

REFERENCES

Al-Awlaqi, M.A., Aamer, A.M. & Habtoor, N. (2021). The effect of entrepreneurship training on entrepreneurial orientation: Evidence from a regression discontinuity design on micro-sized businesses. *The International Journal of Management Education*, 19(1), 1-19.

Alvarado, K. (2016). *Causes of closure of small businesses marketing agricultural inputs.* Unpublished. (Master thesis). University of Guayaquil, Ecuador.

Cabrera, A.A., Martínez, G. & Dupeyron, L.C. (2019). Use of administrative accounting and the importance of Mexico Pymes, *Revista Caribeña de Ciencias Sociales*, [online] Available at: https://www.eumed.net/rev/caribe/2019/07/importancia-pymes-mexico.html

Boubker, O., Arroud, M. & Ouajdouni, A. (2021). Entrepreneurship education versus management students' entrepreneurial intentions. A PLS-SEM approach. *The International Journal of Management Education,* 19(1). 1-14.

Bouzas, J. & Reyes, G. (2020). *Gestión del Talento Humano*. Mexico: IURE editors.

Castillo, J.L., Martínez, M., Soberanes, A. & Sánchez, J.M. (2016). Definition of learning styles in university students according to neurolinguistic programming. *Revista de Docencia e Investigación Educativa*, *2*(3). 25-34.

Colina-Ysea, F.J., Isea-Argüelles, J.J. & Aldana-Zavala, J.J. (2021). Impacto del COVID-19 en pequeñas y medianas empresas del Perú. *Revista de Ciencias Sociales (Ve), XXVII*(Especial 4), 16-31.

Cuesta, A. (2017). *Gestión del talento humano y del conocimiento*, Colombia: Ecoe Ediciones.

Dalisova, N.A. & Grishina, I.I. (2019). Personnel training is a factor in the formation of the export potential of the agro-industrial complex of the region. *Agritech*, 315(2), 1-5.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.

Díaz, J. & Flecha, R. (2010). Comunidades de Aprendizaje: un proyecto de transformación social y educativa. *Revista Interuniversitaria de Formación del Profesorado,* 24(1), 19-30.

eLearning Industry. (2019). Best 20 Value for Money LMS Software for Small Businesses (Smbs). Retrieved from: https://elearningindustry.com/directory/software-categories/learning-management-systems/best/value-for-money/small-business

García, C., Lastikka, A. & Petreñas, C. (2013). Learning Communities. *Revista Electrónica de Geografía y Ciencias Sociales, Scripta Nova*, *XVII*(427), 7-16.

González, J. (2010). *Empresa: marco conceptual y técnicas de gestión por áreas funcionales*, Spain: UAB Editorial.

Gurău, C., Dana, L. & Lasch, F. (2012). Academic entrepreneurship in UK biotechnology firms: Alternative models and the associated performance. *Journal of Enterprising Communities: People and Places in the Global Economy*, 6(2), 154-168.

Hidalgo, J., Vásquez, M., Bravo, L., Burgos, F. & Vargas, Y. (2019) Modelo de aceptación de tecnología TAM en NextCloud. Caso de estudio Escuela Computación e Informática. *Revista Espacios*, 40(21), 4-14.

Hussain, A., Mkpojiogu, E.O.C. & Yusof, M.M. (2016). Perceived usefulness, perceived ease of use, and perceived enjoyment as drivers for the user acceptance of interactive mobile maps. *AIP Conference Proceedings,* 1761(1), 1-6.

Includ-Ed. (2008a). Project. Report 3: Educational Practices in Europe. Overcoming or reproducing social exclusion? Brussels: European Commission. Available at http://www.ub.edu/includ-ed/docs/1._D.8.7%20Report%203.pdf

Includ-Ed. (2008b). Project. Working papers: Case studies of local projects in Europe (2nd round). Brussels: European Commission. Available at http://www.ub.es/included/docs/3._D.22.1_Working%20Papers_Project%206.pdf

Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. Information & management, 38(4), 217-230.

Navarrete, E. & Sansores, E. (2011). El fracaso de las micro, pequeñas y medianas empresas en Quintana Roo, México: Un análisis multivariante. *Revista internacional administración & finanzas*, 4(3), 21-33.

Nieto, M. & Quevedo, P. (2005). Absorptive capacity, technological opportunity, knowledge spillovers, and innovative effort. *Technovation*, 25, 1141-1157.

O'Brien, E., McCarthy, J., Hamburg, I. & Delaney, Y. (2019). Problem-based learning in the Irish SME workplace. *Journal of Workplace Learning*, *31*(6), 391-407.

O'Brien, L. (1990). *Test del Canal de Aprendizaje de preferencia – PNL*. Retrieved from: http://www.iafi.com.ar/pnl/ejercicios-pnl/test-canalpreferencia.pdf.

Pappas, C. (2019). Top 20 eLearning Statistics For 2019 - eLearning Industry. *eLearning Industry*. Retrieved from: https://elearningindustry.com/top-elearning-statistics-2019.

Pérez, O. (2011). Cuatro enfoques metodológicos para el desarrollo de Software RUP – MSF – XP – SCRUM. *Inventum*, 6(10), 64-78.

Pressman, R. (2010). *Ingeniería del Software. Un enfoque práctico*. Mexico: McGraw-Hill.

Puello, P., Del Campo, V.D. & Scholborgh, F.J. (2020). Technological acceptance model (TAM) in the Physics Laboratory III based on the Internet of Things in the Systems Engineering Program of the University of Cartagena. *Revista Espacios,* 41(37). 159-171.

Racionero, S., & Serradell, O. (2005). Antecedentes de las comunidades de aprendizaje. *Educar*, 35, 29-39.

Rodríguez, V. (2011). *Administración de pequeñas y medianas empresas*. Mexico: Cengage Learning.

Rodríguez, A. (2020). Investigación cuantitativa: características, técnicas, ejemplos. Lifeder. Retrieved from: https://www.lifeder.com/investigacion-cuantitativa/.

Rosado, M. (2018). La finalidad de la metodología cualitativa. Fundación IS+D para la Investigación Social Avanzada. Retrieved from: https://isdfundacion.org/2018/09/26/la-finalidad-de-la-metodologia-cualitativa/.

Salas, R.A. (2016). *Diseño y análisis de un Sistema web educativo considerando los estilos de aprendizaje*. Mexico: Editorial Área de Innovación y Desarrollo.

Santana-Domínguez, I., Ballesteros-Rodríguez, J.L. & Domínguez-Falcón, C. (2022). An application of training transfer literature to the analysis of training for entrepreneurship: A conceptual model. *The International Journal of Management Education*, *20*(2), 1-24.

Shafi, M., Liu, J. & Ren, W. (2020). Impact of COVID-19 pandemic on micro, small, and Medium-sized Enterprises operating in Pakistan. *Research in Globalization*, 2, 1-14.

Subra, J. & Vannieuwenhuyze, A. (2018). *Scrum Un método ágil para sus proyectos*. Spain: Ediciones ENI.

Technavio. (2018). *Global Learning Management System Market 2018-2022*. Retreived from: https://www.technavio.com/report/global-lms-market-analysis-share-2018?tnplus.

Tobón, S. (2013). *Formación integral y competencias. Pensamiento complejo, currículo, didáctica y evaluación*. Colombia: Ecoe Ediciones.

Torres, D. & Gago, D. (2014). Los MOOC y su papel en la creación de comunidades de aprendizaje y participación. *Revista Iberoamericana de la Educación Digital (RIED)*, 17(1), 13-34.

Thukral, E. (2021). COVID-19: Small and medium enterprises challenges and responses with creativity, innovation, and entrepreneurship. *Strategic Change*. 30, 153-158.

Whetten, D.A. & Cameron, K.S. (2017). *Desarrollo de habilidades directivas*. Mexico: Pearson.

Wu, B. & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior*, 67, 221-232.