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Artículos científicos

Guía de enseñanza para el aprendizaje exitoso en educación a distancia universitaria

Teaching Methods for Successful Learning in University Distance Education

***Guia de ensino para aprendizagem bem-sucedida em educação a distância
universitária***

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Resumen

El objetivo de este estudio fue analizar las estrategias exitosas de aprendizaje usadas por estudiantes universitarios para adquirir conocimiento en el Portal de la Plataforma Educativa (Seduca3) del nivel superior en educación a distancia, perteneciente a la Universidad Autónoma del Estado de México (UAEM). Para ello, se realizó un diseño no experimental de tipo documental y de campo con corte transversal y método mixto (cuantitativo y cualitativo). El instrumento usado fue aplicado a 165 estudiantes con aprendizajes significativos de cinco carreras universitarias correspondientes a las áreas de ciencias económicas administrativas y ciencias biológicas. Con esto se procuró obtener estándares exitosos de enseñanza para ofrecer a los diseñadores de plataformas educativas guías para homologar y facilitar el aprendizaje. Los resultados demuestran que las estrategias que llevan al éxito académico son las siguientes: 1) conocimiento de objetivos y criterios de evaluación (*qué y para qué se va a aprender*); 2) control del contexto (*con qué se va a aprender*); 3) atribuciones externas para el aprendizaje (*cómo se va a aprender*), y 4) habilidades de interacción social y aprendizaje con compañeros (*con quién se va a aprender*). Esta guía facilita la recuperación de lo aprendido, expresado con la *elaboración*, y asociado con la

retroalimentación positiva por logro, la cual genera la *motivación intrínseca* requerida para continuar aprendiendo. En pocas palabras, para promover un ciclo completo de aprendizaje significativo el estudiante debe tener claro “*por qué, adónde, cómo, cuándo, cuánto, dónde y con quién*” está aprendiendo. Por eso, se recomienda a los diseñadores de plataformas educativas que estos adverbios interrogativos aparezcan de forma explícita en los recursos brindados a los alumnos para facilitar y precisar la adquisición del conocimiento.

Palabras claves: aprendizaje significativo, educación a distancia, estrategias de enseñanza.

Abstract

The objective of study is to analyze the successful learning strategies to acquire knowledge in the Portal of the Educational Platform (SEDUCA3) of the higher level in distance education belonging to the Autonomous University of the State of Mexico (UAEM). Non-experimental design of documentary and field type with transversal cut and mixed method (quantitative and qualitative). Applied to 165 students with significant learning in five university careers, covering the areas of administrative economics and biological sciences, because they wanted to observe the different ways of acquiring successful knowledge. To obtain successful teaching standards that will help the designers of educational platforms to standardize and facilitate learning.

The results show strategies that lead to academic success, which are: 1) Knowledge of objectives and evaluation criteria, indications of what and for what you will learn. 2) Control of the context, indications of what you are going to learn with; 3) External attributes for learning, exposing how you are going to learn. 4) Social interaction and peer learning skills, directing with whom you will learn. The key facilitates recovery of what has been learned, expressed through elaboration and associated with positive feedback by achievement. This is the generator of the intrinsic motivation required to continue learning. Showing a complete cycle of meaningful learning, where the student has clear the question adverbs "why, where, how, when, how much, where and with whom" he is learning. The contribution of the study is: clear and precise expression of the interrogative adverbs within the educational platforms and avoid masking them with synonyms, because they are keys of significant learning. The designers of educational platforms must include them in order to facilitate and specify the acquisition of knowledge.

Keywords: significant learning, distance education, teaching strategies.



Resumo

O objetivo deste estudo foi analisar as estratégias de aprendizagem bem-sucedidas utilizadas por estudantes universitários para adquirir conhecimentos no Portal da Plataforma Educacional (Seduca3) do nível superior em educação a distância, pertencente à Universidade Autônoma do Estado do México (UAEM). Para tanto, foi realizado um delineamento não experimental do tipo documental e de campo, com corte transversal e método misto (quantitativo e qualitativo). O instrumento utilizado foi aplicado a 165 alunos com aprendizagem significativa em cinco carreiras universitárias correspondentes às áreas de economia administrativa e ciências biológicas. Com isso, buscou-se obter padrões de ensino bem-sucedidos para oferecer aos projetistas de plataformas educacionais guias que padronizem e facilitem o aprendizado. Os resultados mostram que as estratégias que levam ao sucesso acadêmico são as seguintes: 1) conhecimento dos objetivos e critérios de avaliação (o que e para o que aprender); 2) controle de contexto (com o que aprender); 3) atribuições externas para aprender (como aprender) e 4) habilidades para interação social e aprendizagem entre pares (com quem aprender). Este guia facilita a recuperação do que foi aprendido, expresso na elaboração e associado ao feedback positivo para o aproveitamento, que gera a motivação intrínseca necessária para continuar aprendendo. Em suma, para promover um ciclo completo de aprendizagem significativa, o aluno deve ter clareza sobre “por que, onde, como, quando, quanto, onde e com quem” está aprendendo. Portanto, é recomendado aos projetistas de plataformas educacionais que esses advérbios interrogativos apareçam explicitamente nos recursos disponibilizados aos alunos para facilitar e especificar a aquisição de conhecimentos.

Palavras-chave: aprendizagem significativa, educação a distância, estratégias de ensino.

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Introduction

The objective of this research was to measure and analyze the successful learning strategies used by students to acquire meaningful knowledge in the portal of the educational platform (Seduca3) of the higher level in distance education belonging to the Autonomous University of the State of Mexico (UAEM). This initiative was developed with the purpose of gathering information to address the problems that affect the performance of the majority of students in the aforementioned educational modality, in which the following data are reported: failure rate (11.4% and 47%), academic dropout rate (18.1% and 32.2%) and terminal efficiency rates (by cut: 11.5% and 41.7%; global: 11% and 65%) (UAEM, 2018).

To have a broad context, 165 students with high performance from five professional careers were evaluated, belonging to two areas of knowledge: administrative economics and biological sciences, areas supervised by the UAEM Directorate of Continuing and Distance Education and taught by Seduca3.

The instrument used was the questionnaire for evaluating the learning strategies of university students (Ceveapeu), since 1) it is designed and validated with Spanish-speaking university students and because 2) it is sensitive to screen learning strategies developed within platforms educational through twenty-five items focused on the use, support and control of electronic material, as well as on the processing of interactive knowledge and networks. This instrument also served as support to answer the following research question: what teaching strategies guide the acquisition of significant knowledge expressed in high academic achievement in distance education?

Long distance education

At present, distance education has become an indispensable teaching tool to promote learning. This has been possible thanks to the use of information and communication technologies (ICT), which have facilitated “universal access to education, equality in instruction, the exercise of quality teaching and learning and the professional development of teachers, as well as more efficient management, direction and administration of the educational system ”(United Nations Educational, Scientific and Cultural Organization [Unesco], 2015, p. 23).

According to Unesco (2013), with the use of various digital devices, great benefits have been achieved, among which the following can be highlighted: 1) greater scope and

equal opportunities in education, 2) ease of personalized learning, 3) immediate response and assessment, 4) anytime, anywhere learning, 5) productive use of time spent in the classroom, 6) creation of new communities of learners, 7) support for learning in specific places, 8) improvement of learning continuous, 9) link between formal and non-formal education, 10) minimal learning disabilities in conflict and disaster areas, 11) support for learners with disabilities, 12) improved communication and administration and 13) maximum cost effectiveness.

To achieve such benefits, distance education relies on three fundamental elements: 1) ICTs, which allow its informational operation to be specified, since they are a set of technological means for communication; 2) learning and knowledge technologies (TAC), which stimulate technological literacy and meaningful learning, as they are educational tools or media (Shen, Wang and Shen, 2009) and 3) technologies of empowerment and participation (TEP), which promote collaborative learning, because they are the social networks of formal and informal knowledge that allow the construction of information (Dolors, 2019a). These have their ethical laws aimed at the virtual world and work in favor of the acquisition of knowledge (Dolors, 2019b).

Now, despite all these advantages, it can be stated that in Mexico, open or distance education constitutes only 14% of the total enrollment in higher education in the country (Tuiran, 2019). This is because from the beginning (30 years ago) it has been conceived solely as a supplement to face-to-face education or as an educational method to reach marginalized populations (whether due to distance, time or money). In short, it is not taken into account that distance education is an excellent option for literacy around technological language, a basic requirement to promote labor inclusion and communication and information coverage in all current media.

The importance of this training medium is reflected in the educational reform, chapter XI, article 84, On information technologies, communication, knowledge and digital learning, where it is stated that the education provided by the State will use ICT and digital learning to strengthen pedagogical models, educational innovation and to close the digital gap that exists with other developed countries, establishing the educational digital agenda that will mark the adaptation to technological changes, practical innovation and creativity for the developmental problem solving (*Diario Oficial de la Federación [DOF]*, 2019).

Non-distance schooling educational model at UAEM

The non-distance education model is designed for formal educational programs of upper secondary, professional and advanced levels. The Directorate of Continuous and Distance Education (Decyd) —since 2004— proposes and supervises the development of learning programs, which present current scientific and technological content required in the national and international labor market in order to promote comprehensive training and quality.

Likewise, the Department of Professional Studies of the Distance System designs, coordinates and evaluates the teaching programs, as well as the specific study guides for different subjects (UAEM, 2020). The educational platform used is the Educational Services Portal (Seduca3) - belonging to the UAEM-, which has been refining and updating with the execution since January 2015 of its version 3. This is in charge of providing the teaching and materials to operate the study guides and technology tools. To do this, it uses state-of-the-art computer technology, certified by the ISO 9001: 2008 standard in the development of academic acts of continuing education and graphic design of online educational materials. (UAEM, 2020).

Assessment questionnaire for university students' learning strategies (Ceveapeu)

This questionnaire is based on the self-regulated learning model of Pintrich and Schrauben (1992), which takes into account sustainable learning in education, thus exceeding the first recognized scales of evaluation of learning strategies, such as the scale of strategies of learning (ACRA) (Román and Gallegos, 2001), the adaptation of the questionnaire of learning strategies (CEA) (Beltrán, Pérez and Ortega, 2006) and the scale of learning strategies (ACRA-abbreviated) (De la Fuente and Justice, 2003).

This questionnaire assesses the learning strategies in different contexts, among which educational platforms can be included, since they can be adapted to new electronic tools. In this way, the theoretical conjunction of acquisition, fixation and reproduction of knowledge can be established in a model or "map" as complete as possible, a member of various substantive learning strategies (Gargallo, Suárez-Rodríguez and Pérez-Pérez, 2009).

The questionnaire presents two scales: 1) affective strategies, support control, consisting of the subscales of motivational strategies, affective strategies, context control

strategies, social interaction and resource management, as well as metacognitive strategies, all included in 53 items with $\alpha = 0.819$. Also, 2) strategies related to processing, which contain the subscales of search, collection and selection of information, acquisition, elaboration, organization and storage, personalization and creativity strategies, transfer and use of information, all included in 35 items with $\alpha = 0.864$ (Gargallo et al., 2009).

The questionnaire presents adequate construct validity, contrasted by the evaluation of the judges and by factor analysis. Most of the scales show a significant correlation at the 0.01 level and general reliability in Cronbach's alpha ($\alpha = 0.841$).

In total, it contains 88 items organized into two scales, nine subscales, and twenty-five strategies. In addition, it has the following five rating levels: very adequate (4 points), agree (3 points), undecided (2 points), disagree (1 point) and very unsuitable (0 points), rated by these ranges: good, regular and bad (Gargallo *et al.*, 2009).

Method

The present research has been developed based on a non-experimental design of a documentary and field type, with a cross-section and mixed method (quantitative and qualitative), with descriptive and inferential statistics. It has been applied to a group of students with the highest and most significant academic performance within their professional careers (specifically, five professional careers belonging to two areas of knowledge: administrative economics and biological sciences) in order to analyze the strategies of successful learning in distance education. The population consisted of 716 students, while the sample was obtained with the formula for finite populations. In this way, a sample of 165 students (23.05%) was obtained.

Process

- Phase 0. Documentary research, analysis of educational trajectories to select students with significant learning due to their high academic averages in each of the five professional careers.
- Phase 1. E-mail promotion and ethical dissemination of the procedure. A personalized invitation was made to each of the students; in this they were informed that they had been selected for their good averages within their university careers, so they would be part of a research project registered at the university. They were also asked to

participate with the resolution of the evaluation questionnaire of the learning strategies of university students (Ceveapeu), facilitated through a web page. Likewise, they were informed about the ethical treatment of their data and results, both with confidential use.

- Phase 2. Database compilation and extraction.
- Phase 3. Data analysis: The quantitative analysis consisted of 1) the descriptive statistics for socio-educational data and data from the questionnaire for evaluating the learning strategies of university students (Ceveapeu); With this, measures of frequency, means and percentage of age, gender, degree, academic level and subscales of the questionnaire were obtained. Likewise, 2) in the inferential statistics, the student's t test was used to know the existence of difference between five groups. For the qualitative analysis, the hierarchical process analysis method was used, using the priority and consistency matrix technique in the subscales of learning strategies associated with their high academic performance in their professional career. (Saaty, 2010).

Results

Using descriptive statistics, the main characteristics of the sample were known: gender equality in terms of participation, age between 23 and 24.11 years, 74.5% are working and are in the 4th year of the career (table 1).

Tabla 1. Características socioacadémicas y laborales de la muestra

		Género			
Espacios académicos	Licenciatura	Muestra	Masculino	Femenino	Total
Facultades	Administración	81.42	38	43	81
	Informática Administrativa	28.98	17	12	29
	Enfermería	20.47	6	15	21
Unidades académicas	Logística	18.86	13	6	19
	Negocios Internacionales	14.95	8	7	15
Total		164.68	82	83	165
		Trabajan			
Edad cronológica		SÍ	NO	Año académico	
18 a 20 años	28	12	16	1.º	12
21 a 22 años	49	28	21	2.º	32
23 a 24 años	51	38	13	3.º	46
24 a 26 años	26	16	10	4.º	65
27 a más años	11	9	2	5.º	10
Total		165	103	62	165

Fuente: Elaboración propia

In the Student's t test for five independent samples, no significant difference was observed between the means and the standard deviation of the five groups, so it is assumed that they have a normal distribution (Table 2).

For the qualitative study, the hierarchical process analysis method was used, specifically the priority and consistency matrix technique in the subscales of learning strategies associated with their significant learning due to high academic performance in their professional career (Saaty, 2010). In the first place, the Knowledge of objectives and evaluation criteria was observed; second, Context Control was perceived; thirdly, external Attributions were analyzed; fourthly, social interaction and learning skills with peers were taken into account, and finally, 1) Elaboration and 2) intrinsic motivation were included (table 2).

Tabla 2. Descriptivos y jerarquía de las estrategias de aprendizaje

Escalas	Subescalas	Estrategias	Media	D.S	Lugar
Estrategias afectivas, de apoyo y control (o automanejo) ($\alpha = .819$) (53 ítems)	Estrategias motivacionales ($\alpha = .864$) (20 ítems)	<i>Motivación intrínseca</i> ($\alpha = .500$) (3 ítems)	11.45	0.55	5
		Motivación extrínseca ($\alpha = .540$) (2 ítems)	7.45	0.68	
		Valor de la tarea ($\alpha = .692$) (4 ítems)	13.12	2.88	
		Atribuciones internas ($\alpha = .537$) (3 ítems)	10.98	1.02	
		<i>Atribuciones externas</i> ($\alpha = .539$) (2 ítems)	7.48	0.52	3
		Autoeficacia y expectativas ($\alpha = .743$) (4 ítems)	15.01	0.99	
		Concepción de la inteligencia como modificable ($\alpha = .595$) (2 ítems)	6.29	1.71	
	Componentes afectivos ($\alpha = .707$) (8 ítems)	Estado físico y anímico ($\alpha = .735$) (4 ítems)	14.82	1.18	
		Ansiedad ($\alpha = .714$) (4 ítems)	14.23	1.77	
	Estrategias metacognitivas ($\alpha = .738$) (15 ítems)	<i>Conocimiento de objetivos y criterios de evaluación</i> ($\alpha = .606$) (2 ítems)	7.67	0.33	1
		Planificación ($\alpha = .738$) (4 ítems)	15.32	0.68	
		Autoevaluación ($\alpha = .521$) (3 ítems)	11.29	0.71	
		Control, autorregulación ($\alpha = .660$) (6 ítems)	23.12	0.88	
	Estrategias de control del contexto, interacción social y manejo de recursos ($\alpha = .703$) (10 ítems)	<i>Control del contexto</i> ($\alpha = .751$) (4 ítems)	15.63	0.37	2
<i>Habilidades de interacción social y aprendizaje con compañeros</i> ($\alpha = .712$) (6 ítems)		23.47	0.53	4	
Estrategias relacionadas con el procesamiento de la información ($\alpha = .864$) (35 ítems)	Estrategias de búsqueda y selección e información ($\alpha = .705$) (8 ítems)	Conocimiento de fuentes y búsqueda de información ($\alpha = .685$) (4 ítems)	15.01	0.99	
		Selección de información ($\alpha = .630$) (4 ítems)	14.87	1.13	
	Estrategias de procesamiento y uso de la información	Adquisición de información ($\alpha = .677$) (3 ítems)	10.34	1.66	
		<i>Elaboración</i> ($\alpha = .739$) (4 ítems)	15.45	0.55	5

$(\alpha = .821)$ (27 ítems)	Organización ($\alpha = .810$) (5 ítems)	18.32	1.68	
	Personalización y creatividad, pensamiento crítico ($\alpha = .771$) (5 ítems)	18.01	1.99	
	Almacenamiento. Memorización. Uso de recursos mnemotécnicos ($\alpha = .765$) (3 ítems)	10.29	1.71	
	Almacenamiento. Simple repetición ($\alpha = .691$) (2 ítems)	6.32	1.68	
	Transferencia. Uso de la información ($\alpha = .656$) (3 ítems)	11.32	0.68	
	Manejo de recursos para usar la información adquirida ($\alpha = .598$) (2 ítems)	7.21	0.79	

Fuente: Elaboración propia

Discussion

Distance education has specific teaching conditions. It should be clear that even though interactivity is one of the main characteristics of virtual platforms, its simple use does not improve learning or its quality, since its impact is associated with the attitudes shown by users (González, López, Trujillo and Rojas, 2018; Villalba, García, Gaxiola and Borbolla, 2017). Therefore, it is necessary to focus efforts on the design of learning strategies that allow addressing the type of difficulties in the acquisition, storage and retrieval of information, since they are the basis of self-regulated learning, that is, in the way in which The individual is capable of adjusting their actions and goals to the technological environment of the educational platform (Moreno, 2017). The capacity for self-regulation, in short, plays a key role in academic success and in any virtual context (Navarrete and Manzanilla, 2017), since it gives the user a feeling of adaptation to the activities presented (González et al., 2018).

On the other hand, it can be stated that the theoretical background is reflected in the results of the present investigation. That is, in the first place, there is the Knowledge of objectives and evaluation criteria, which means that the learner must be clear about what and for what he is going to learn. Second, you have the Control of the context, which is associated with the criterion with what you are going to learn, for which knowledge and management of the devices or tools used is required. Thirdly, the external attributions for learning are

observed, that is, the learning strategies used to acquire knowledge. In fourth place, the Skills of social interaction and learning with peers are shown, which reflects other acquisition skills with who is going to learn, relying on social interaction. Fifth, there are two strategies: a) the elaboration or the process of recovering what has been learned, which is linked to b) the intrinsic motivation or feedback of what has been learned. The union of both learning strategies confirms the closing of one cycle and the opening of another to continue learning (Pando, 2018). In other words, the results show that the essential elements for successful learning should not be lost sight of.

On the other hand, the theoretical aspects must be linked to self-regulation, which is enhanced when students know with certainty “why, where, how, when, how much, where and with whom” they are learning, criteria that are sometimes overlooked by the designers of educational platforms. Therefore, for the feeling of fluidity and comfort of distance learning to be generated, designers must provide information based on thought guides that take into account the aforementioned interrogative adverbs. Thus, errors in the acquisition, assimilation and reproduction of the information to be taught can be reduced and the flow of knowledge can be accelerated. (Csikszentmihalyi, 2014).

Conclusions

In the distance education process, training should be sought with clear learning guides that facilitate adaptation and access to the information provided. In other words, it should not be forgotten that the virtual student is "alone" in front of a screen that by itself does not guarantee effective communication. For this reason, working on the empowerment of electronic tools will allow the student to function in this environment with the same naturalness that is generated in the physical environment of the classroom. In short, when clear thinking guides are offered, the acquisition of knowledge can be accelerated, regardless of the career or area of study studied. Therefore, it would be convenient for designers of educational platforms to develop digital teaching tools taking into account the aforementioned questions (why, where, how, when, how much, where and with whom you are learning), which should appear explicitly in the resources provided to students. This, in short, could contribute to the decrease in the failure rates and academic dropouts.

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