



Original article

Evaluating the impact of vocational training on students of non-pedagogical university courses

La evaluación del impacto de la formación laboral en estudiantes de carreras universitarias no pedagógicas

Avaliação do impacto do treinamento baseado no trabalho em alunos de cursos universitários não docentes

Luis Aníbal Alonso Betancourt¹



<http://orcid.org/0000-0003-0989-746X>

Prudencio Alberto Leyva Figueredo¹



<https://orcid.org/0000-0001-5730-4054>

Vadim Aguilar Hernández²



<https://orcid.org/0000-0003-2690-6380>

¹University of Holguín "Oscar Lucero Moya". Holguín, Cuba.



jalonsob@uho.edu.cu;

albertoleyva@uho.edu.cu

²University of Pinar del Río "Hermanos Saíz Monte de Oca". Pinar del Río, Cuba.



vadim.aguilar@upr.edu.cu

Received: April 9, 2024

Accepted: November 19, 2024

ABSTRACT

This article is based on the need to evaluate the impact of vocational training on education professionals, specifically on university professors of university courses. The objective was to offer a methodology for evaluating the impact of vocational training on students of non-pedagogical university courses, based on the investigative-certificate method of evidence of impacts from a teaching-learning dimension, socio-laboral linkage, scientific-technical and methodological preparation and the performance of the subjects. Quantitative pre-experimental research was carried out using the methods of analysis, synthesis, system approach, observation and the chi-square statistic that allowed to verify the existence of favorable impacts on higher education professionals working in non-pedagogical courses. The study concludes by stating that the methodology provided contributed to improving the performance of higher education professionals (teachers) in the evaluation of the objective or distorted effects that occur in the process and result of the vocational training of students in non-pedagogical university courses for decision-making for their continuous and systematic monitoring. The methodology can be applied in all universities, in business contexts and in universities that train health professionals with the relevant adjustments.

Keywords: evaluation; job training; impact; methodology.

RESUMEN

En el presente artículo se fundamenta en la necesidad de evaluar el impacto de la formación laboral en los profesionales de la educación, en específico los docentes de carreras universitarias. El objetivo estuvo dirigido a ofrecer una metodología para la evaluación del

impacto de la formación laboral en estudiantes de carreras universitarias no pedagógicas, fundamentada en el método indagativo-certificativo de evidencias de impactos, desde una dimensión de enseñanza-aprendizaje, vinculación sociolaboral, preparación científico-técnica y metodológica y de actuación de los sujetos. Se realizó una investigación cuantitativa de tipo preexperimental empleando los métodos de análisis, síntesis, enfoque de sistema, la observación y el estadígrafo chi-cuadrado, que permitieron constatar la existencia de impactos favorables de los profesionales de la Educación Superior que trabajan en carreras no pedagógicas. Se concluye el estudio planteando que la metodología aportada contribuyó a mejorar el desempeño de los profesionales de la Educación Superior (docentes) en la evaluación de los efectos objetivos o distorsionados que ocurren en el proceso y resultado de la formación laboral de los estudiantes de carreras universitarias no pedagógicas para la toma de decisiones para su seguimiento continuo y sistemático. La metodología puede ser aplicada en todas las universidades, en contextos empresariales y en las universidades formadoras de profesionales de la salud con las adecuaciones pertinentes.

Palabras clave: evaluación; formación laboral; impacto; metodología.

RESUMO

Este artigo se baseia na necessidade de avaliar o impacto do treinamento em serviço nos profissionais da educação, especificamente nos professores universitários. O objetivo foi oferecer uma metodologia para a avaliação do impacto da formação em serviço em estudantes de cursos universitários não pedagógicos, com base no método investigativo-certificador de evidência de impacto, a partir de uma dimensão de ensino-aprendizagem, vínculo sócio-ocupacional, preparação e desempenho científico-técnico e metodológico dos sujeitos. Foi realizada uma pesquisa quantitativa pré-experimental utilizando os métodos de análise,

síntese, enfoque sistêmico, observação e a estatística qui-quadrado, o que permitiu confirmar a existência de impactos favoráveis dos profissionais do Ensino Superior que atuam em carreiras não pedagógicas. O estudo conclui afirmando que a metodologia contribuiu para melhorar o desempenho dos profissionais do ensino superior (professores) na avaliação dos efeitos objetivos ou distorcidos que ocorrem no processo e no resultado do trabalho de formação dos alunos em carreiras universitárias não pedagógicas, a fim de tomar decisões para seu monitoramento contínuo e sistemático. A metodologia pode ser aplicada em todas as universidades, em contextos empresariais e em universidades que treinam profissionais de saúde com as devidas adaptações.

Palavras-chave: avaliação; treinamento no trabalho; impacto; metodologia.

INTRODUCTION

The university as a social institution is the product of a very different era from the present. In its origins, universities became the institutions that stored all of society's knowledge. The development of science at that time made this situation possible. Until the first half of the 20th century, it was possible to say with a fair degree of certainty that when persons completed their university studies, they were prepared to work professionally for the rest of their lives.

In the last century, Higher Education has helped to prepare professionals who have graduated from various careers to face all the technological advances that have been taking place, since science and technology undergo such rapid changes that when the graduate arrives at his or her workplace, he or she finds that the content received in class is somewhat outdated and the employer requires that this new worker who joins its ranks undergoes a process that qualifies him or her to perform with quality.

The need to evaluate the impact of vocational training on education professionals, specifically on university professors of university courses, is increasingly recognized in institutional, public and private settings and by people interested in training.

For this reason, knowing the results, effects and impacts of vocational training on these professionals in order to make decisions regarding the quality, relevance and equity of the introduction and generalization of scientific, methodological, improvement or other results associated with this subject, which have been applied, constitutes an urgent need to contribute to the continuous improvement and enhancement of the initial and permanent profession of education professionals in the systematization of vocational training for university students.

Several studies have been carried out on the evaluation of the impact of vocational training on the training of human resources for performance in labor entities, among which are: Berner et.al. (2025), Gaviria and Valencia (2019), Centelles, Domínguez and Ávila (2019), Baker (2020), Alonso, Cruz and Olaya (2020), Avalos and Del Huerto (2021), as well as García, Villa and Romero (2022), in which conceptions about this process are offered, however, the approach to the dynamics of evaluating the impact of vocational training on students of technical sciences (non-pedagogical) careers is insufficient.

It was therefore pertinent to investigate the following scientific problem: how to evaluate the impact of vocational training for students of non-pedagogical university courses?

Hence, the present work aims to propose a methodology for evaluating the impact of vocational training for students of non-pedagogical university courses.

MATERIALS AND METHODS

The type of research that was undertaken was quantitative, experimental and within it, pre-experimental, since firstly the logic, the path and the way to follow for the evaluation of the impact of vocational training of students of non-pedagogical careers were explained and subsequently the data obtained with its introduction through a case study in the same sample of teachers from the University of Holguín before and after its application.

Thus, this quantitative and pre-experimental approach started from the idea of the problem and its approach, visualizing the scope of the methodology as a scientific result that is provided in the research, elaboration of the hypothesis and determination of the variables and development of the research design.

The research hypothesis stated that the application of a methodology for evaluating the impact of job training for university students in non-pedagogical careers, which was based on the investigative-certificate method of impact evidence, contributes to improving the preparation of teaching performances of higher education professionals.

In this hypothetical approach, the dependent variable referred to the teaching performance of higher education professionals and the independent variable to the methodology for evaluating the impact of job training on students of non-pedagogical university courses.

Of the scientific methods adopted, the bibliographic analysis and synthesis method was cited based on the collection, study and extraction of knowledge and good practices associated with training based on transversal competences (also recognized as generic).

The pre-experimental design was used to validate the methodology provided along with the Chi-Square statistic (X^2) according to the criteria of Hernández, Hernández and Edenia (2017) to verify the research hypothesis and,

therefore, the significant transformations achieved in the teachers' performance in the evaluation of the impact of job training for students of non-pedagogical careers.

Observation was also used to verify the behavior of teaching performance, as well as the introduction of the methodology from the integration of the academic, work and research components.

The population targeted by the case study carried out to validate the proposed methodology was composed by higher education professionals (teachers) from the University of Holguín. Through simple random sampling by statistical recommendation, a sample of 100 of them was selected using simple random probability sampling, which represents 15.0% and makes it representative of the population size.

RESULTS

Theoretical platform for evaluating the impact of vocational training.

The evaluation was determined by the objectives, but its effectiveness undoubtedly took into account, to a large extent, the number, frequency and quality of the controls applied, as well as the correct and uniform grading of the results. Its continuous nature allowed for the constant checking of the results and the assessment of their trend, which made it possible to form a dynamic criterion on the student's performance.

Impact assessment is a recent development compared to other types of evaluation, but it has been widely discussed at a national and international level. Initially treated in the environmental field as a process of analysis and prevention of environmental impacts, it was later extrapolated to almost all areas of research, as in the case of the impact assessment of educational programs.

This was one of the most important tools available to assess the quality of processes carried out in the various branches of the social sphere, including education. The need to assess impact was recognized by those interested in training. Knowing the results, effects and impacts of training programs was essential to make decisions in favor of their quality, relevance and equity.

The belief that it involves processes that are demanding in terms of information and time, and, therefore, relatively complicated and expensive, often inhibited the use of this practical tool. In terms of evaluation, the most orthodox methods were not always better, as they are often only reproduced in laboratories and are not related to the daily practice of training.

The impact was the ultimate goal of training, which should be reflected in improvements in the well-being of participants, in the productivity of companies and in society as a whole. Based on all the analyses carried out, it was considered and operationally defined that the evaluation of the impact of vocational training for higher education professionals constitutes the qualitative and quantitative assessment and certification process of the transformations (changes) that have occurred in the training process of professionals and in their performance as university teachers, as well as the effects that these generate in the performance of their students and in society, as a consequence of the introduction and generalization of research results, as well as administrative, methodological and improvement activities in the academic, labor, research and university extension components, which will allow their continuous improvement and enhancement.

In this definition assumed from the operational point of view, the following characteristics were taken into account:

- It is a process that aims to assess and to certify the changes and transformations that have occurred in the training process

of university students and in the performance of university teachers. In other words, it aims to investigate and to assess the changes, whether objective (favorable) or distorted (unfavorable), that occur gradually and progressively in a process and in its result.

- It also recognizes that the impact assessment is aimed at verifying the impacts (changes and transformations) that have occurred in the performance of university students and in society, as a consequence of the impacts (changes) that have occurred in the training process of the university student and in the performance of the teacher, that is, it allows to expand the scope of this process by also assessing and certifying the impact of the impact.
- It recognizes that the inquiry-qualitative and quantitative assessment of the changes and transformations that occur in the process and its result must be a consequence of the introduction and generalization of results derived from scientific research, as well as administrative, improvement and methodological activities that are carried out from the academic, labor, research and university extension components.
- It recognizes that the result obtained allows for decision-making and the implementation of training intervention actions based on the continuous and systematic improvement of said process over time.

The results obtained also allowed us to confirm that the evaluation of the impact of the vocational training of higher education professionals constitutes a process of contextualized socio-professional interaction that promotes and mobilizes dialogic-reflective communication and academic and scientific exchange between teachers, students, company tutors, families and other members of the community who participate in the evaluation act.

As previously stated, the impact assessment on higher education was based on two essential categories: assessment and certification.

The assessment category, interpreted as a value judgment, was regulated on the basis of the criteria, dimensions, indicators and levels that allowed for the issuance of assessment criteria about the changes and transformations that occurred in the performance of university professors and in the training process of their students in the academic, work, research and extension components, as well as the effects that these generated in turn in the performance of the student and in society in general.

For its part, the certification category was interpreted as recognition, affirmation and accreditation. of the qualitative and quantitative changes and transformations that occurred in the professional training achieved by higher education professionals, as well as in the process they directed and the effects that these generated in the performance of their students and in society in general.

Based on these theoretical references, the methodology is presented below.

Methodology for evaluating the impact of vocational training:

The methodology aimed to evaluate the impact of job training in university contexts.

It was based and directed from a theoretical perspective on the investigative-certificate method of evidence of impacts, which expresses the path to follow to investigate and to certify from a quantitative and qualitative point of view the transformations that have occurred in the process of training professionals in university contexts, in the results of the same (performance of the subjects involved) and in the effects that these generate from the economic, environmental, energetic and social points of view.

The method in its internal structure was based on three procedures, they are:

1. Procedure for designing instruments for assessing the impact of vocational training.
2. Procedure for developing impact assessment instruments.
3. Procedure for evaluating the results of the instruments applied.

The first procedure expressed the path to follow to design impact assessment instruments for vocational training in university contexts, taking into account the processes of inquiry-certification of evidence from established dimensions and indicators, as well as through the fulfillment of the evaluation functions.

The second procedure expressed the path to follow to apply the impact assessment instruments, through compliance with established premises, as well as the functions of the evaluation: pedagogical, innovative and control.

The third procedure allowed us to evaluate the results of the assessment of the impact assessment instruments from a qualitative and quantitative point of view, which allowed us to investigate and to certify evidence of the impact of vocational training in university contexts.

Based on these procedures, the actions to be taken are presented below.

Procedure for designing instruments for assessing the impact of vocational training. Actions carried out:

1. Determine the dimensions for evaluating the impact of job training

Dimensions constitute spheres of the object coherently configured, in a unit of more specific elements. Thus, dimensions are understood as integrating spheres to evaluate the impact of vocational training in university contexts.

In this sense, the following dimensions were proposed:

Dimension 1: Direction of the teaching-learning process

This dimension allowed us to investigate and to assess from a qualitative and quantitative point of view the transformations (changes) that have occurred in the professional training of Education professionals who work in university contexts during the teaching they provide, taking into account their disciplinary diversity.

Dimension 2: Socio-laboral connection

This dimension allowed us to investigate and to assess from a qualitative and quantitative point of view the transformations (changes) that have occurred in the professional training of Education professionals who work in university contexts during their attention to work practice (work component), the university extension work and scientific-student work that they carry out in the careers in which they work as teachers.

Dimension 3: Scientific-technical and methodological preparation

This dimension allowed us to investigate and assess from a qualitative and quantitative point of view the transformations (changes) that have occurred in the professional training of Education professionals who work in university contexts during the development of the improvement, training, methodological work and scientific-research activity that they carry out, in order to transform their professional training process.

Dimension 4: Professional performance of students

This dimension allowed us to investigate and to assess the effects generated by the transformations achieved in the professional training of Higher Education professionals working in university contexts, in the professional performance of these students

according to their psychopedagogical characterization.

Dimensions 1 to 3 allowed us to investigate and to certify from a qualitative and quantitative point of view the transformations (changes) that have occurred in the professional training of Higher Education professionals who work in university contexts, while dimension 4 allows us to investigate and to assess from a qualitative and quantitative point of view the effects generated by the transformations achieved in the professional training of these professionals, in the professional performance of university students.

2. Designing research instruments- assessing evidence of the impact of job training

In this action, the instruments were designed, for which the following will be taken into account:

- The educational potential of the forms of academic, work and research organization.
- Fulfillment of the functions: pedagogical, innovative and control.

The instruments, depending on the type designed, must fulfill the functions of the evaluation. In this sense, instruments were designed based on the following types (there may be others): Observation of productive and service work, teaching, scientific and management in the workplace, using observation lists and/or rating scales, surveys of the population and community leaders, performance exams, surveys, interviews with employers, company tutors, students, tutors, review of documents that characterize the job training process, among others.

- Assume for its design according to the typology proposed in the model, the following general structure: dimension of impact that is evaluated, criteria and evidence of impacts, as well as the

sequential actions for the inquiry - certification of evidence of impacts: the items of open and closed questions, case studies, among other actions that the instrument will use, are established based on the functions of the evaluation and the evaluation rubric: Finally, the evaluation rubric that allows measuring the successes and failures and certifying the impacts according to the established dimension is declared.

3. Validate the impact assessment instruments designed

The instruments designed were proven to be valid and reliable, using expert criteria, socialization workshops with specialists and the implementation of pilot tests to verify whether they really allow for investigating and certifying evidence of impacts in accordance with the established dimensions.

Procedure for developing impact assessment instruments

Actions:

1. Organize the process of applying impact assessment instruments

The process of applying the instruments was organized, taking into account the following criteria: population selection, samples according to statistical techniques, formation of work groups according to dimensions, determination of dates, times and spaces for the application of the instruments.

2. Applying the investigation tools- certification of evidence of impact

In order to carry out this action, the following recommendations were offered: To observe that instruments meet the requirements of: objectivity, relevance, balance, equity, diagnosis and effectiveness, to achieve intensive work, revealing the potential of the process and its advances on the path of vocational training, to

create a climate of mutual trust between evaluators and those evaluated, so that they feel free of tension and clearly express their evaluative criteria, to promote a prospective self-assessment of experiences (positive and negative), to investigate evidence that allows to certify objective or distorted effects of vocational training according to dimensions of impact evaluation, product of the introduction of scientific and investigative results, to certify the impacts by obtaining, understanding and interpreting evidence, the formulation from critical reflection of value judgments, to integrate the evaluative actions of the instrument that is applied from each one of the dimensions of impact evaluation, as well as to systematize the unity of instructive, educational and developmental actions during the evaluative act.

3. Monitor compliance with the implementation of the instruments

Finally, the implementation of the instruments was controlled and monitored, which must be carried out taking into account the following criteria: compliance with the evaluation functions: pedagogical, innovative, control, the adequate application of the recommendations offered, as well as the in-depth study of each of the components of the impact evaluation process.

Procedure for evaluating the results of the instruments

Actions

1. Interpret each of the instruments applied in individual order. The qualitative and quantitative data obtained from each of the instruments applied in the previous procedure were interpreted using descriptive and inferential statistics, this will be done instrument by instrument.
2. Interpret the results obtained through data triangulation. A workshop (team work) was carried out to triangulate the data, qualitative and quantitative results

obtained in each of the instruments individually, using descriptive and inferential statistics.

3. Certify the evidence of impact of the vocational training obtained. Finally, evidence of impacts (whether objective or distorted) of vocational training in university contexts was certified by dimensions.

A technical report was prepared and offered to management bodies containing each of the impacts by dimension, as well as the continuity tasks for improving the process based on the distorted effects.

In this final process, it was recommended to take into account the following premises: The impartiality that allows each evaluator and evaluated to be able to criticize in a favorable or unfavorable way the performance evidence found, the meaning and sense of the evaluative act, the interpretation between those evaluated and evaluators, so that achieve the same level of understanding of the criteria of evidence of demonstrated impacts, mutual respect in the face of disagreeing ideas and value judgments issued, the effectiveness, efficiency, reliability and validity of the instruments applied.

This methodology was applied through a pedagogical pre-experiment, achieving the results shown below.

As this was a pre-experiment, the dependent variable was operationalized as follows: parameterization of the variable, teaching performance for the evaluation of the impact of vocational training, in which the criterion of incorporating the use of digital technology in the indicators was taken into account (Table 1).

Table 1- Teaching performance for the evaluation of the impact of vocational training, in which the criterion of incorporating the use of digital technology in the indicators was taken into account

Dimension	Indicator	Evaluation criteria
Evaluating the impact of vocational training during the academic component	1. Linking content to the professional model	<ul style="list-style-type: none"> Excellent: When between 90.0 and 100.0% of indicators 1 to 8 are met Very good: when between 80.0 and 89.0% of indicators 1 to 8 are met Good: when between 70.0 and 79.0% of indicators 1 to 8 are met. Regular: when between 60 and 69.0% of indicators 1 to 8 are met Bad: when it is below 60.0% of the indicators.
	2. Linking content to the revealing job qualities of job training	
	3. Objectives and contents from the accessibility of the curriculum	
	4. Instructional, educational and developmental method	
	5. Problematic virtual teaching methods (use of virtual classroom, open educational resources and mobile devices) to develop work qualities	
	6. Forms of teaching organization: conferences, seminars, practical classes, workshops based on the methodological work regulations	
	7. Use of the investigative method (work-related formative research)	
	8. Evaluation used in connection with the professional model and work qualities	
Evaluating the impact of vocational training during the labor-research component	1. Planning and organizing the development of work qualities from performance in the workplace during work practice	<ul style="list-style-type: none"> Excellent: When between 90.0 and 100.0% of indicators 1 to 6 are met Very good: when between 80.0 and 89.0% of
	2. Treatment of the development of work qualities from performance in the workplace during work practice	

Evaluating the impact of vocational training on student performance in the workplace	3. Control of the development of work qualities from performance in the workplace during work practice	<ul style="list-style-type: none"> indicators 1 to 6 are met Good: when between 70.0 and 79.0% of indicators 1 to 6 are met. Regular: when between 60 and 69.0% of indicators 1 to 6 are met Bad: when it is below 60.0% of the indicators.
	4. Use of ICTs: virtual classroom, open educational resources and mobile devices	
	5. Use of the investigative method (investigative work training)	
	6. Evaluation used in connection with the professional model and work qualities	
	1. Characterization of professional problems that are addressed through job rotation	
	2. Characterization of technological work methods	
Evaluating the impact of vocational training on student performance in the workplace	3. Selection of technological work methods with economic, energy and environmental criteria oriented towards sustainable development	<ul style="list-style-type: none"> Excellent: When between 90.0 and 100.0% of indicators 1 to 6 are met Very good: when between 80.0 and 89.0% of indicators 1 to 6 are met Good: when between 70.0 and 79.0% of indicators 1 to 6 are met. Regular: when between 60 and 69.0% of indicators 1 to 6 are met Bad: When it is below 60.0%
	4. Work qualities: creative, entrepreneurial, leader, organized, hard-working, responsible, flexible, independent	
	5. Using the investigative method in solving professional problems	
	6. Use digital technology (virtual classroom, mobile devices), others	

DISCUSSION

The authors consider that the evaluation was developed jointly by a group, and measured the behavior and performance of the students; it is a value judgment that expresses the magnitude and quality with which the proposed educational objectives have been achieved. The grades are established conventional forms that express the result of the evaluation in categories, which allows the performance of the students to be ordered or classified.

Evaluation is the process of qualitative and quantitative assessment and certification of the behavior of the process and result of the training that a subject achieves in a continuous and systematic manner; based on the degree to which the established patterns, codes, strategies and/or dimensions and indicators are achieved.

In Higher Education, evaluation can be interpreted as the process of qualitative and quantitative assessment of the criteria and evidence of performance demonstrated by the student during professional activity, which allows the certification of the work competencies and objectives established by the professional model, discipline and subject programs, as well as decision-making for feedback and continuous improvement of their training process.

Alonso et al. (2020) consider that the professional training process is conscious, planned and organized, "developing in educational institutions and work entities from a dynamic integrated with teaching, work, research and extension in unity between the instructive and the educational through socio-professional interaction" (p. 18)

Vocational training is interpreted from an evaluative perspective as the process and result of the development of work qualities, vocations and professional interests in the personality of the subject that allow him to produce articles and provide services of social and individual utility and need in his transformation throughout life, being a broader approach than vocational

training, since work includes the professional and the occupational.

Hence, the evaluation of vocational training is considered the process of qualitative and quantitative assessment and certification of the level of development of the work qualities that are manifested in the personality of students periodically; based on the degree to which the objectives and content that they are achieving during their training process are achieved.

During vocational training, also called professional training, the evaluation takes into account the criteria of teachers, specialists from labor entities and students, allowing the professional profile of the graduate to be formed by constituting the synthesis of the characteristics that a professional must possess (Aguilar and González, 2023).

In Higher Education, the evaluation of work training can be interpreted as the process of qualitative and quantitative inquiry and assessment of the criteria and evidence of the development of work qualities in the performances demonstrated by the student during the production of articles and the provision of services of social necessity and utility, which allows their certification, as well as decision-making for feedback and continuous improvement of their training process.

The evaluation presupposes the issuance of value judgments on the results achieved, taking into account the processes implemented to obtain them and the cost-benefit of the activity carried out, which are collected in a final opinion issued by the evaluation committee created for this purpose, which indicates whether the person evaluated has vocational training appropriate to the level he or she is currently at.

Based on these criteria, an analysis is carried out on what is understood by evaluation of the impact of the vocational training of higher education professionals.

The methodology according to Alonso et al. (2019) "is a set of actions interrelated by a method or set of them (...)" (p. 232) These authors consider that the methodology is made up of a cognitive theoretical apparatus and an instrumental one. The methodology was applied in the period from January 2023 to December 2024, as can be seen in the following comparative results before and after its application.

It is recognized that evaluation in Higher Education constitutes the process of qualitative and quantitative assessment and certification of the objectives of the subject and discipline programs that students must achieve during their training process from the academic, work and research components.

Impact is essentially interpreted as the process of change and transformation of a given process, as well as its results, which can be objective (positive, favorable) or distorted (negative, unfavorable).

The methodology for assessing the impact of vocational training in university contexts proposes a system of actions aimed at qualitative and quantitative inquiry and certification of the changes and transformations (objective or distorted) that occur in the process of training of university students during the academic, labor, research and university extension components, the performance of university professors in applying the concept of vocational training from the academic, labor, research and university extension components, the performance of students in the performance of their tasks and functions in their jobs in production and service companies, as well as in society from a technical, economic, energy, environmental and social point of view.

The pedagogical pre-experiment applied through observation and the chi-square test (X^2) demonstrated with 95.0% confidence that with the application of the methodology the performance of Higher Education professionals (teachers) is improved for the evaluation of the

impact of job training of students of non-pedagogical university careers.

BIBLIOGRAPHIC REFERENCES

- Aguilar, V., González Y. A (2023). La formación profesional: universidad-entidad laboral. Tareas durante el proceso evaluación. En T. Y. Cala Pegueros & P. Gougoulakis (Eds), *Habilidades profesionales, competencias y formación para el emprendimiento* (pp 6-22). LiberCiencia. <http://rc.upr.edu.cu/jspui/handle/DICT/4124>
- Alonso, L. A., Leyva, P. A. y Mendoza, L. L. (2019). La metodología como resultado científico: alternativa para su diseño en el área de ciencias pedagógicas. *Revista Opuntia Brava*, 11 (Especial 2), 231-247. <http://opuntiabrava.ult.edu.cu/index.php/opuntiabrava/article/view/915>
- Alonso, L. A.; Cruz, M. A., Olaya, J. (2020). Dimensiones del proceso de enseñanza - aprendizaje para la formación profesional. *Revista Luz*, 19 (2), p. 17-29, <http://luz.uho.edu.cu/index.php/luz/article/view/1032>
- Ávalos, R. y Del Huerto, M. E. (2021). Desarrollo histórico de la evaluación del impacto de la formación de especialidades médicas en Cuba. *Revista Médica Electrónica*, 43 (2), 3147-3158. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1684-18242021000203147&lng=es&tlng=es
- Baker, J. L. (2020). *Evaluación del impacto de los proyectos de desarrollo en la pobreza: manual para profesionales*. Washington: Banco Mundial. <http://www.bivipas.unal.edu.co/handle/10720/514>

- Berner, H. H., Darville, P., Guzmán, N., Montoya, A. M. y Izquierdo, S. (2015). *Metodología de la evaluación del impacto*. Santiago. CHILE: División de Control de Gestión. I Jornada de Doctores en Ciencias de la UCMH 2015. <http://doccien2015.sld.cu/index.php/2015/2015/paper/view/34/17>
- Centelles, J. S., Domínguez, I. y Ávila, E. R. (2019). La evaluación del impacto de la formación laboral de los estudiantes en las carreras pedagógicas. *Revista Caribeña de Ciencias Sociales*. <https://www.eumed.net/rev/caribe/2019/07/impacto-formacion-laboral.html//hdl.handle.net/20.500.11763/caribe1907impacto-formacion-laboral>
- García, K. A., Ortiz, T. y Chávez, M. D. (2021). Relevancia y dominio de las competencias digitales del docente en la educación superior. *Revista Cubana de Educación Superior* 40 (3). http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0257-43142021000300020&lng=es&tlng=es
- García, A., Villa, A., Aláez, M. y Romero, S. (2022). Aplicación y resultados de un sistema para evaluar la calidad de la docencia universitaria en una década de experimentación. *Revista de Investigación Educativa*, 40(1), 51-68. <http://dx.doi.org/10.6018/rie.401221>
- Gaviria, D. y Valencia, A. (2019). Percepción de la estrategia aula invertida en escenarios universitarios. *Revista Mexicana de Investigación Educativa* 24 (81). <http://dialnet.unirioja.es/servlet/articulo?codigo=7135277>
- Hernández, R., Fernández, C. y Baptista, P. (2014). *Metodología de la investigación*. (5ta Ed.), Edamsa impresiones S.A. de C.V. http://www.esup.edu.pe/descargas/dep_investigacion/Metodologia%20de%20la%20investigaci%C3%B3n%205ta%20Edici%C3%B3n.pdf
- Hernández, Y, Hernández, V. J., Edenia, N. y Tejada, E. (2017). ¿Chi cuadrado o Ji cuadrado? *Revista Medcentro Electrón*. 21(4), 294-96. <http://scielo.sld.cu/pdf/mdc/v21n4/mdc01417.pdf>
- Juca, F., Carrión, J. y Juca, A. (2020). B-learning y Moodle como estrategia en la educación universitaria. *Revista Conrado* 16 (76), pp. 215-220. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1990-86442020000500215&lng=es&tlng=es

Conflict of interests:

The authors declare not to have any interest conflicts.

Authors' contribution:

The authors participated in the design and writing of the article, in the search and analysis of the information contained in the consulted bibliography.

Cite as

Alonso Betancourt, L. A., Leyva Figueredo, P. A., Aguilar Hernández, V. (2024). Evaluating the impact of vocational training on students of non-pedagogical university courses. *Mendive. Journal on Education*, 22(4), e3832.

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3832>



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)