

TEACHER COMPETENCY DEVELOPMENT PROGRAM AND ITS IMPACT: THE CASE OF THE YAQUI VALLEY IT PROGRAM FOR THE DEVELOPMENT OF TEACHING SKILLS AND ITS IMPACT: IT CASE VALLE DEL YAQUI

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Abstract - This paper presents the stages carried out for the development of the ITVY teaching competency program, the evaluation of teachers' competency achievement different labor competency standards, and the results achieved in the number of certified teachers, and their impact on failure rates and student complaints. The first step was to identify teaching competencies in the teaching-learning process through the detection of training needs -DNC; subsequently, the teaching competency development program was out in which the competency evaluation was performed following the process established by Conocer; finally, the impact of the program on the failure and complaint rates was determined, in the period from January 2018 to December 2019.

Empirical results show a 16% reduction in failure rates and a 35% reduction in student complaints to teachers.

Key words: Teaching competencies, labor competency standard, Tecnológico del Valle del Yaqui.

Abstract -- This work presents the stages carried out for the development of the ITVY teaching competencies program, the evaluation of the achievement of the teachers' competence through different labor competency standards, and the results achieved in the number of certified teachers, and its impact on student complaint and failure rates. The first step was to identify the teaching competencies in the teaching-learning process through the detection of training needs - DNC;

subsequently, the teaching competency development program was carried out in which the competence assessment was carried out following the process established by Conocer; Finally, the impact of the program on the failure and complaint rates was determined, in the period from January 2018 to December 2019. The empirical results show a 20% reduction in failure rates and a 50% reduction in student complaints towards teachers.

Key words: Teaching competencies, Standard of labor competency, Technological of the Yaqui Valley.

INTRODUCTION

In 2015, the competency-based curriculum was implemented in all campuses of the Tecnológico Nacional de México, for all study programs, however, the adoption this Educational Model based on professional competencies, has been slow and with a rejection by teachers.

As a strategy for academic improvement, the Yaqui Valley campus has promoted programs for the development of teaching competencies, as well as certification in different competency standards, to support teachers in the process of evaluation and accreditation of the subjects that make up the undergraduate curricula for the training and development of professional competencies [1], understanding competencies as the comprehensive actions to identify, interpret, argue and solve problems with suitability and ethical commitment, mobilizing different knowledge: being, doing and knowing [2 - 4].

A competency in education is a set of behavioral, social, effective, cognitive, psychological, sensory and motor skills that allow to adequately perform a profession (David McClelland cited in [5]). In relation to a standard of competence. [6] defines it as the definitions of the habits, abilities, skills and attitudes required for a person to perform any productive, social or governmental activity, with performance defined by the sectors themselves.

The National Council for Standardization and Certification of Labor Competencies is a parastatal entity sectorized in the Ministry of Public Education that has a tripartite governing body (see Figure 1), its purpose is to provide an instrument to strengthen economic competitiveness, growth capacity and social progress for the benefit of Mexico, through the National System of Competencies (SNC) of people [7].

Based on the above, CONOCER, through the Competency Management Committees (CGC), which are supported by technical groups of experts, elaborate the competency standards (CS). An example of this is the Tecnológico Nacional de México, which, with expert personnel, forms the CGC of EC0772 Evaluation of learning with a focus on professional competencies [8].

Another standard related to teaching practice is EC0217 "Delivery of human capital formation training courses in a face-to-face group setting", which is intended to serve as a reference for the evaluation and certification of people who deliver human capital formation courses in a face-to-face and group setting, as well as for the development of training and formation programs based on the CE [9].



Figure 1. Tripartite governance of CONOCER.
Source: Conocer.

The evaluation of competencies of a candidate to obtain a Conocer certification is similar in three aspects to the evaluation that a TecNM teacher must make to the students to ensure that the professional competence has been achieved: It is done through the presentation of evidence (conceptual, procedural and attitudinal), it is based on a clearly defined and detailed evaluation plan, and the evaluation criteria are known by the candidate or student [10 -12].

Considering the above, when the teacher or professor participates in an evaluation process for certification purposes, he/she is "living" what the student experiences when he/she is evaluated by the teacher, so the teacher becomes familiar with the concept of professional competencies, and therefore the planning of the course, its delivery and respective evaluation is facilitated.

In addition, the certification in different labor competency standards, related to their teaching practice, will contribute to the development of teaching competencies, since, for example, EC0217 indicates the requirements necessary to demonstrate competence in 3 fundamental topics: Prepare, Conduct and Evaluate training courses. The preparation is done by proposing the course planning and verifying that the necessary resources for its development are ready and working; in conducting the course, it is focused on framing, development of the topics and the closing of both the topics and the course, supported by the application of instructional and group techniques that contribute to facilitate the learning process, and finally, the evaluation of the course.

learning at the beginning, during and at the end of the course, considering the satisfaction of the participants.

DEVELOPMENT

Materials

Three materials were used for the development of this work: the training needs registration form, the ITVY annual training program form and the labor competency standards issued by Conocer, following at all times the TecNM guidelines [12, 14].

Method

This work was carried out in four stages:

1. Detection of training needs carried out by the Academic Development Department in each academic department of IT Valle del Yaqui.
2. Based on the above, the teaching competencies required in the teacher for the implementation of the TecNM competency-based model will be identified and the training program will be developed.
3. Implementation of the training program for teaching competencies, in critical competencies and through certifications.
4. Evaluation of the impact of the teacher competency training program.

In stage three, the teacher evaluation was carried out by means of labor competency standards issued by Conocer, for example, EC0217, which establishes the theoretical, basic and practical knowledge that a candidate must have in order to perform his or her job.

DISCUSSION Y ANALYSIS ANALYSIS OF RESULTS

In stage 1 (DNC), the Academic Development Department sent to each academic department head, the Training Needs Detection form, this is done according to the procedure established for all campuses and is annual.

In stage 2 (Identification of teaching competencies) the results indicated that the top three teacher training needs for the new educational model [14, 15] were:

1. Didactic instrumentation and evaluation instruments.
2. Teaching techniques and strategies.
3. Evaluation of competence

Table 1 shows the standards selected for inclusion in the teacher training developed by the academic development department.

Table 1.- Standards selected for the program.

Code	EC Title
EC0217	Capital formation courses in a face-to-face group setting.
EC0772	Learning assessment with a focus on professional competencies
EC0020	Formulation of the design of rural sector investment projects.

Source: Own elaboration.

In stage 3 implementation of the teacher training program), the program was carried out in the period from August 2017 to February 2019.

A central part of the training program in teaching competencies is that the teachers who participate, on a voluntary basis, obtain the corresponding certification, which would indicate that they have achieved the competency according to the requirements of Conocer.

To understand the certification process of a teacher participating in the program, an example is briefly presented using EC0217.

A candidate demonstrates his or her competence in a CB, so he or she must demonstrate it through the presentation of evidence of Products, Performances, Knowledge and Attitudes, habits and values according to what is established in the CB. Table 2 shows the requirements for the product evidences.

Table 2.- Product evidence requirements in EC0217.

1	Descriptive letter	☐ It is produced in printed and/or digital format ☐ It includes the general objective, ☐ It includes the particular objectives, ☐ Include the name of the course ☐ Includes the instructor's name ☐ Sets the place of instruction ☐ Indicates the total duration of the course ☐ Indicates the duration of each activity.... + 8
2	The checklist on the requirements of the session:	☐ It is prepared in printed and/or digital format, ☐ Contains course name, ☐ Contains instructor's name, ☐ Contains fields to record the existence of materials and equipment, ☐ Correspond with the descriptive letter... + 3
3	The learning evaluation applied:	☐ They contain the name of the course, ☐ They contain the date of application, ☐ Contain the name of the trainee, ☐ Contain the instructions for its resolution, and ☐ Present the reagents according to the objectives of the course.
4	Initial Diagnosis	☐ Same as above
5	The final course report prepared:	☐ Includes instructor's name, ☐ Includes course name, ☐ Includes course development date, ☐ It includes the instructor's comments on the learning process and group, ☐ Specifies in a descriptive way the level of fulfillment of the objectives and expectations of the course, + 8

Source: Own elaboration.

The evaluation process for certification purposes contains the following steps:

1. Interview of the evaluator with the candidate.
2. Elaboration of the candidate's evaluation plan.
3. Presentation of evidence of Performance, Knowledge and Products according to the evaluation plan.
4. Competency opinion issued by the evaluator based on the evidence presented.
5. Certificate processing for candidates with Competence Achieved opinion

In the evaluation of Element 1.- Prepares the training course session, the candidate checked, prior to the beginning of the session and according to the checklist, the existence and functioning of the resources required for the session.

Subsequently, the candidate presents the elaborated descriptive letter (Figure 2) that must comply with the guidelines of the standard, a document used by the instructor or facilitator as a guide to develop a single session or a complete course. It may be referred to as an instructional guide or session plan.

CARTA DESCRIPTIVA

Curso:	Lugar de impartición	Clave	Departamento / Carrera:	Docente:
Fundamentos de Auditoría	Aula 504	CPC-1024	Económico Administrativo / Contador Público	MLA

Duración Total:	30 horas	Perfil del Usuario:	Perfil, Conocimientos y Habilidades de los Participantes
Teoría: 20 horas	Práctica: 10 horas	Conocimientos en Auditoría, Contabilidad, Finanzas, Administración	Conocimientos de las Normas de Información Financiera, Contabilidad, Finanzas básicas, etc.

Presentación

Describir una auditoría, distinguir entre contabilidad y auditoría, conocer la importancia de la auditoría en la reducción de riesgo en la información financiera, diferenciar los tipos de auditoría, la importancia del control interno. Conocer y aplicar las normas y procedimientos de auditoría.

Objetivo general / Competencia a desarrollar

Al concluir el curso el estudiante será capaz de identificar las diferencias entre el proceso contable y el de auditoría, así como analizar, aplicar e interpretar las normas y procedimientos de auditoría.

Figure 2.- Example of a descriptive chart (sheet 1).
Source: Own elaboration.

The checklist (Figure 3) indicates the equipment and materials required so that the candidate can verify the existence and operation of the same.

LISTA DE VERIFICACION

Nombre de la Institución: _____

Curso: Fundamentos de Auditoría Fecha: 25 de Enero de 2016

Docente: _____ Lugar: Aula 504 de ITVV

Listado de Requerimientos de material didáctico

Material	Cantidad	Cumple SI / NO	Observaciones
Pintaron	1	✓	
Marcadores para pintaron	2	✓	
Borrador	1	✓	
Proyector electrónico	1	✓	
Extensión eléctrica	1	✓	
Computadora con lector de CD/DVD y puerto para memoria flash USB	1	✓	
Cuestionarios de diagnóstico inicial	15	✓	

Listado de Requerimientos de instalaciones

Concepto	Cantidad	Cumple SI / NO	Observaciones
Tamaño de aula	-----	✓	Capacidad para 35 participantes
Limpieza del aula	-----	✓	Día
Contactos eléctricos	6	✓	
Extensión multi contacto	1	✓	
Iluminación natural	-----	✓	
Iluminación artificial	-----	✓	
Clima artificial	-----	✓	
Sillas para participantes	16	✓	
Mesa para expositor	1	✓	
Silla para expositor	1	✓	
Mesa para equipo de proyección	1	✓	
Acomodo adecuado de mesas y sillas	-----	✓	Ordenadas en filas

Figure 3.- Example of Requirements Checklist.
Source: Own elaboration.

The evidence of knowledge is presented by means of a questionnaire, which evaluates Learning Domains: Classification of objectives in learning domains (cognitive, psychomotor and affective).

Likewise, the Attitudes/Habits/Values to be evaluated were: Order (the way in which the candidate integrates the information contained in the descriptive letter according to a sequence from the general to the particular) and Responsibility (checks the sufficiency and disposition of the materials and equipment according to the space and number of trainees).

The points evaluated in Element 2. Conduct training courses were:

1. Conducting the framing, diagnostic evaluation (and informing the trainees on how their learning will be evaluated).
2. To develop the sessions using instructional and group techniques that facilitate the learning process and carrying out the learning evaluations according to the descriptive chart.

An example of a performance evaluation is presented in figure 4.

Materia:	Lugar/Fecha:	Carrera:	Docente:	Unidad/Tema:
Fundamentos de Auditoría	Aula 504 ITVY 10-febr-16	Contador Público		3 Conceptos Generales de Auditoría

Estudiante(s): B. Carlos Adriano

Guía de observación de exposiciones

Instrucciones para el llenado del instrumento: En evidencias de desempeño, se establece que el candidato realiza diferentes actividades. El evaluador entregará cada una de estas actividades con la guía de observación y señalará con 'X' aquellos aspectos que sí cumplen, en la columna correspondiente, y señalará los que no cumplen en la columna NO, anotando las observaciones correspondientes.

Nota: Las evidencias de actitud deberán ser observadas por el evaluador tanto en los documentos que presente el candidato, así como en su desempeño.

Reactivos	SI	NO	Valor	OBSERVACIONES
1.- Inicio de la sesión:				
1.- Presentación hacia los estudiantes.	✓		0.5	
2.- Presentación de Objetivos.	✓		0.5	
3.- Definición de los puntos a tratar en la sesión.	✓		0.5	
4.- Durante la sesión:				
4.- Utilización de material de apoyo.	✓		0.5	
5.- Desarrollo de los temas.	✓		2.0	
6.- Información Complementaria de los temas.	✓		2.0	
7.- Claridad en los temas.	✓		0.5	
8.- Mantiene contacto visual con los participantes.	✓		0.5	
9.- Cierre de la sesión:				
9.- Respuesta a preguntas de los estudiantes.	✓		1.0	
10.- Resumen o Conclusiones de la información.	✓		1.0	
11.- Los integrantes trabajaron en equipo.	✓		1.0	
RESULTADO DE LA EVALUACIÓN :			10.0	

Figure 4.- Example of an Observation Guide.
Source: Own elaboration.

The evidence of knowledge is presented by means of a questionnaire, which evaluates Group Dynamics: Main characteristics and behaviors in group dynamics, Types of groups (Silent, participative, indifferent),

aggressive) and Roles of the skilled (The contreras, the expert, the ally, the novice).

Likewise, the Attitudes/Habits/Values to be evaluated to the candidate were: Kindness (La

The way in which it allows the trainees to express their doubts) and Tolerance (The way in which it accepts the comments of the Participants for the Continuous Improvement of the Course). Evaluating the learning before, during and at the end of the course, considering the satisfaction of the participants is Element 3.- Evaluate the training courses: Learning evaluation instruments that were applied, the final report should include the following points shown in Figure 5.

Informe Final del Curso

Nombre de la Institución:	
Curso:	Fundamentos de Auditoría
Fecha:	08 de marzo de 2016
Periodo del curso:	Del 25 de Enero al 08 de Marzo de 2016
Lugar:	Aula 504 ITVY
Docente:	

Comentarios del docente acerca del proceso de aprendizaje y del grupo
 Los alumnos presentaron mucho interés en los temas expuestos en el curso, y una participación muy activa; mostraron entusiasmo en la mayoría de los temas, salvo 3 alumnos que mostraron un poco de apatía.
 Lo importante en el desarrollo del aprendizaje fue la presentación dinámica de los temas, la utilización de videos y exposición de temas con imágenes significativas que coadyuvaron a un mayor aprovechamiento y aprendizaje.

Nivel de cumplimiento de los objetivos y de las expectativas del curso
 Los objetivos se cumplieron satisfactoriamente, con un 100% de alumnos aprobados con calificaciones muy buenas.
 Los alumnos quedaron muy satisfechos con lo aprendido en el curso, lo cual aplicarán posteriormente en el desarrollo de sus materias y vida profesional.

Contingencia presentadas y su resolución

Figure 5.- Example of a final course report.
Source: Own elaboration.

The Attitude/Habit/Value to be evaluated to the candidate was: Responsibility (Submits the final course report within the time established in the evaluation plan).

Future work

Given that the empirical results show an improvement in failure rates, future work would consist of validating these results in larger sample and through statistical analysis.

CONCLUSIONS

Today, more than 90 ITVY professors and teaching staff have been trained in the different ECs, and 76 certificates have been awarded (Table 3). Given that 12 IT staff members are certified in EC0076, they are qualified to conduct future evaluations for certification purposes for colleagues at ITVY or other TecNM campuses.

Table 3.- List of number of certified personnel in CE.

Code	EC Title	Certified personnel
EC0217	Delivery of human capital training courses in the following ways group face-to-face training.	26
EC0772	Evaluation of learning with approach at professional competencies	24
EC0020	Formulation of the design of investment projects in the rural sector.	14
EC0076	Evaluation of the competence of candidates based on Competency Standard.	12

Source: Own elaboration.

Therefore, the program has fulfilled its objective of training teachers in competencies that support the implementation of the TecNM educational model.

On the other hand, the empirical results show that they have been favorable in the teaching and administrative staff, an increase in IDs elaborated based on EC0772, a decrease in student complaints of 35 % and 16 % in reprobation rates, which justifies continuing with this work dynamic. The data is a comparison of January 2018 with December 2019.

Recommendations

Nowadays it is important to keep up to date with the latest

The aim is to continue adding personnel to the technological community, who are certified in a standard of competence that will have an impact on the institutions to improve indicators such as dropout and failure rates, and at the same time improve their academic competitiveness.

A teacher certified in a standard such as this, should have the ability to broaden their vision to learning scenarios that will allow them to improve and integrate their work team in such a way that the results will be of greater benefit and impact on their learning to obtain knowledge. This experience strengthens the academic level of the teaching community and has an impact on their students and work teams in a face-to-face and group manner.

Therefore, it is recommended that the campus authorities promote professional and teaching development, providing the facilities to train and educate teachers.

competent teachers who become certified in standards related to their work, as well as teachers who continue to be interested in learning new and better ways to perform their work.

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