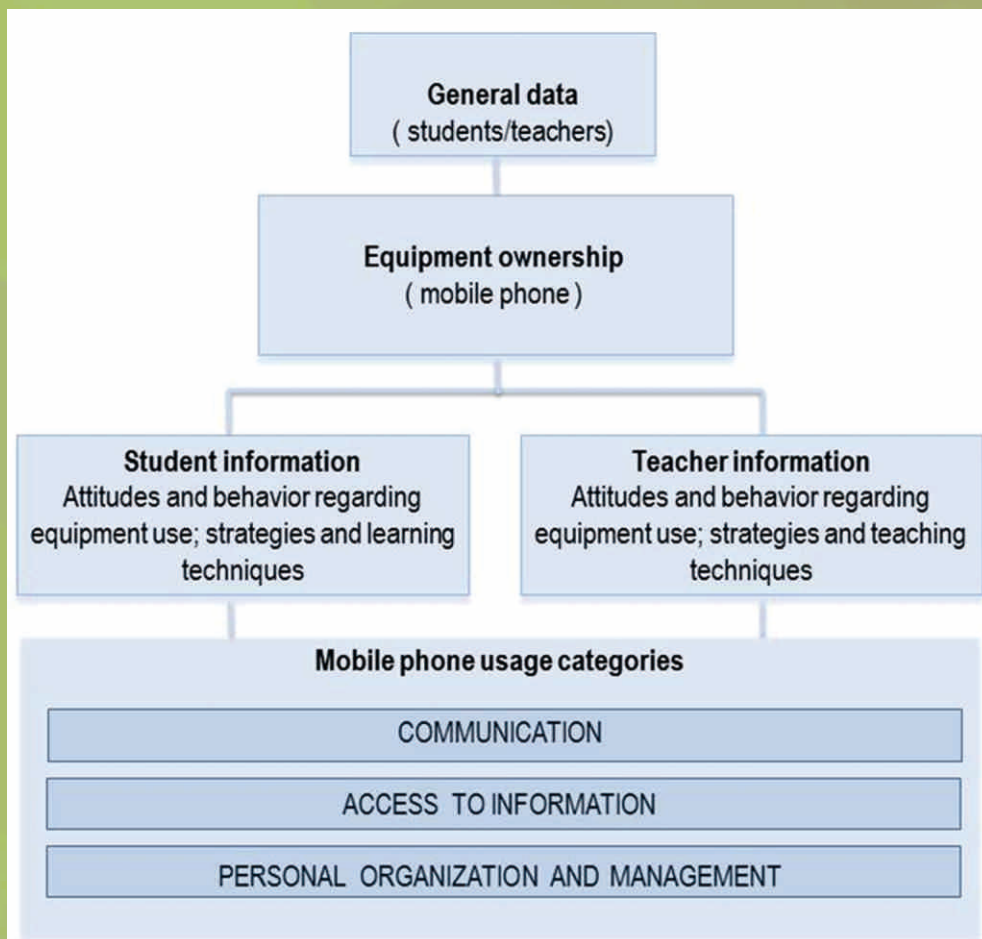




Creative Education

Special Issue on Adoption and Use of Technology in Education



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Evaluation by Rubrics: A Computerized System

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Abstract

This report details a computerized system that allows teachers to use rubrics as a means of evaluation in a curriculum competency. The computerized system for evaluation by rubrics allows you to design them, modify them, and generate a bank with them so that they can be used later. It is a software that allows you to assess, co-assess, and self-assess either team or individually, the evidence of learning in a course through rubrics and represents an example of how the proper use of the new technologies can become a differentiating factor assessment process of learning about traditional evaluative practices by providing tools that allow use of time and material resources in a more effective and efficient manner both, for the teacher and the student.

Keywords

Rubrics, Curriculum Competency, Software, New Technologies

1. Introduction

At the end of the XX century, and the beginning of the XXI, a change is observed in the new technologies in many areas of life, the information and media. These last are closer every day to people in databases, information running around drowning us in seas of information that becomes a challenge to surf (Lei, Shen, & Johnson, 2014; Roehrig, Groos, & Guzey, 2014; Singley & Taft, 1995). There has been a resounding change within society, leaving aside industrial society and builds on the information society, which emphasizes the value of the data produced and the power of knowledge as a means to change the reality; later *the learning society* suppose a step in it, and individuals must learn throughout life to survive. And finally, *the intelligence society* emphasizes

*Corresponding author.

the idea of shared and distributed intelligence (Beltrán, 2011, 2013).

The use of the computer, among other things, allows extending the content being assessed, generating expert systems of correction, administration via Internet, the best items for certain assessment objectives (optimal tests) or to certain people (computerized adaptive tests) and so forth. We agree with Prieto, Carro, Orgaz, Pulido, and González-Tablas (1993) and Ishiyama and Watson (2014) in the sense that one of the important applications of personal computers is the construction and management of computerized tests that can replace some fields to the classic pencil and paper tests; allowing storage of data without pre-encoding steps with greater accuracy, speed, and immediate feedback when giving results; and facilitate registration latency time response to each item and the multimedia presentation, with the inclusion of texts, graphics, photographs and even videos and simulations.

It is also clear that automated systems allow for more accurate and reliable data, increasing speed and efficiency of the analysis, presentation and storage, thus untying the teaching routine and mechanical tasks, thereby promoting greater availability of time for other teaching tasks (Roland, 2006; Singley & Taft, 1995; Warren, Lee, & Najmi, 2014).

On the other hand, one of the undeniable characteristics of education systems today is the complexity of the learning goals proposed (Jonassen, 2014; Petropoulou, Vassilikopoulou, & Retalis, 2011) since it is the assessment which goal is to corroborate these learning objectives as well as identify the factors that influence or affect such learning, without neglecting the quality and improvement of the educational intervention (Marín, Guzmán, & Castro, 2012), to evaluate becomes a complex and overwhelming process for teachers. And it is this context where the rubrics describing the degree to which a learner is running a process or a product based on clear and consistent performance criteria, allow to monitor and self-assess learning product, reducing the subjectivity in evaluating and helping to identify errors, understand their causes and make decisions to overcome them turning them into essential tools to ensure that the evaluation is integrated into everyday classroom processes, be continuous, encourage feedback and be coherent within the teaching-learning process (Petropoulou et al., 2011; Roland, 2006).

Therefore, this current project describes a computerized system designed to facilitate the use of rubrics as a means of evaluation, self-assessment and co-assessment; that is a system designed to improve the assessment process in an educational program established with competence approach.

2. Method

Next, the steps performed in the design of the Computerized Assessment System for Learning by Rubrics (SIEAR) are specified.

2.1. Analysis

At this stage, several discussion meetings of the research group were defined in detail the components and functions of the Computerized Assessment System for Learning by Rubrics (SIEAR) to be taken into account in their design.

2.2. Beta Version: Design and Testing of SIEAR

Once the new editor was technically finished and steady enough to work normally, tests were done to identify either the features and/or functions that would require to be modified.

2.3. Design and Testing of Version 1.0 of SIEAR

Once the corrections and modifications were made to that of the beta version, a free error software was achieved with a quality, suitable to be used by latter users. This version was again subjected to tests to identify the features and functions that needed to be corrected.

2.4. Design Module Installation SIEAR

After reaching Version 1.0 soft ware package using Install Shield 5.5 Professional Edition installer new editor was designed for distribution to latter users.

2.5. Overview SIEAR

The Automated System for the Assessment of Learning Through Rubrics (SIEAR) is a software that allows to assess, co-assess and self-assess in a teaching course, either team or individually the evidence of learning by rubrics. It consists of six modules: Builder of the course structure, rubrics Builder, Settings, Learning Assessment, Reporting and System Generator.

The **Figure 1** shows the module builder of the course structure, in addition to allowing define the general characteristics of the course: name, authors, sections, students, teachers, evidence of learning.

Builder module rubrics allow design, import, and/or customize the rubrics by which the evidence of learning each of the activities proposed in the course will be evaluated, see **Figure 2**.

Figure 3 contains the configuration module allows predetermine some relevant characteristics of the user interface as colors, font size, coordinates, etc.

The learning assessment module, besides being the user interface; allows assessing, co-assessing, and self-assessing either team or individually the learning evidence of the course and storing the results of evaluations, self-assessments or co-assessments made; see **Figure 4**.

Figure 5 shows the module reports, besides focusing and displaying the results of assessments, co-assessments, or self-assessments made, allows to support them in a destination different than the original.

The generator system module, allows to copy, either aim is selected, the files that establish the Computerized Assessment System for Learning and Using Rubrics to be used in the course for which it was designed; it is illustrated in **Figure 6**.

3. Graphical Modeling Procedure for Using the Software

Step 1: Define the overall course structure and enrollment of students and teachers; see **Figure 7**.

Step 2: Design of learning activities, evidence of performance, assessments and rubrics; it is illustrated in **Figure 8**.

NOMBRE DEL CURSO, DIRECTOR, GRUPO DE DISEÑO, REVISORES Y TIPO DE SECCIÓN.

Escriba el prefijo del curso; utilice un máximo de 5 caracteres
Para finalizar oprima la tecla TAB.

Curso:

Director del proyecto:

Planeación y Diseño:

- Humberto Blanco Vega
- Juan Cristóbal Barrón Luján
- José René Blanco Ornelas
- Martha Ornelas Contreras
- Ma. del Carmen Zueck Enriquez
- Jesús Viciania Ramírez
- Jeanette López Walle

Revisores:

- Humberto Blanco Vega
- Juan Cristóbal Barrón Luján

Tipo de sección:

Prefijo:

SIGUIENTE

Figure 1. General Data display, builder module course structure.



Figure 2. Displayedit rubrics, rubric builder module.



Figure 3. Configuration menu of SIEAR interface, module configuration menu.

AUTOEVALUACIÓN INDIVIDUAL Actividad 1 Unidad 1: Evidencia 2 de la Actividad 1

ACTUALMENTE SE ENCUENTRA EVALUANDO A:
Ornelas Contreras José René 1001
Aspecto 1 de 5 Ponderación 20%

Definición del problema

(10) **Competente sobresaliente** El problema planteado esta muy bien definido y delimitado

(9) **Competente avanzando** El problema planteado esta bien definido y delimitado

(8) **Competente intermedio** El problema planteado esta definido y delimitado de manera regular

(7) **Competente básico** El problema planteado esta mal definido y delimitado

(6) **Aún no competente** No hay definición ni delimitación del problema planteado

[Salir del Sistema](#)
[Regresar al Menú Anterior](#)
[Revisar](#)

Figure 4. LCD for assessing aspects of the rubric, learning assessment module.

COEVALUACIÓN INDIVIDUAL GENERAL
Actividad 1 Unidad 1: Evidencia 1 de la Actividad 1
Ornelas Contreras Martha Resultado Global: 88.3% (N=3)

Aspecto	Ponderación	Porcentaje
Precisión y calidad de las respuestas	1	96.7
Confiabilidad de las fuentes	1	86.7
Cumplimiento a cabalidad del ejercicio	1	90.0
Ortografía y puntuación	1	80.0

Precisión y calidad de las respuestas: Competente sobresaliente
Todas las respuestas desarrollan el tema a cabalidad, responden exactamente a lo que se cuestiona y dan una idea clara y precisa del tema que se aborda.

OBSERVACIONES Y/O COMENTARIOS:

estas son las observaciones de hugo para martha

estas son las observaciones de jos? ren? para martha

estas son las observaciones de luis para martha


[Salir del Sistema](#)
[Regresar al Menú Anterior](#)



Figure 5. Menu results of the assessment of evidence, reports module.

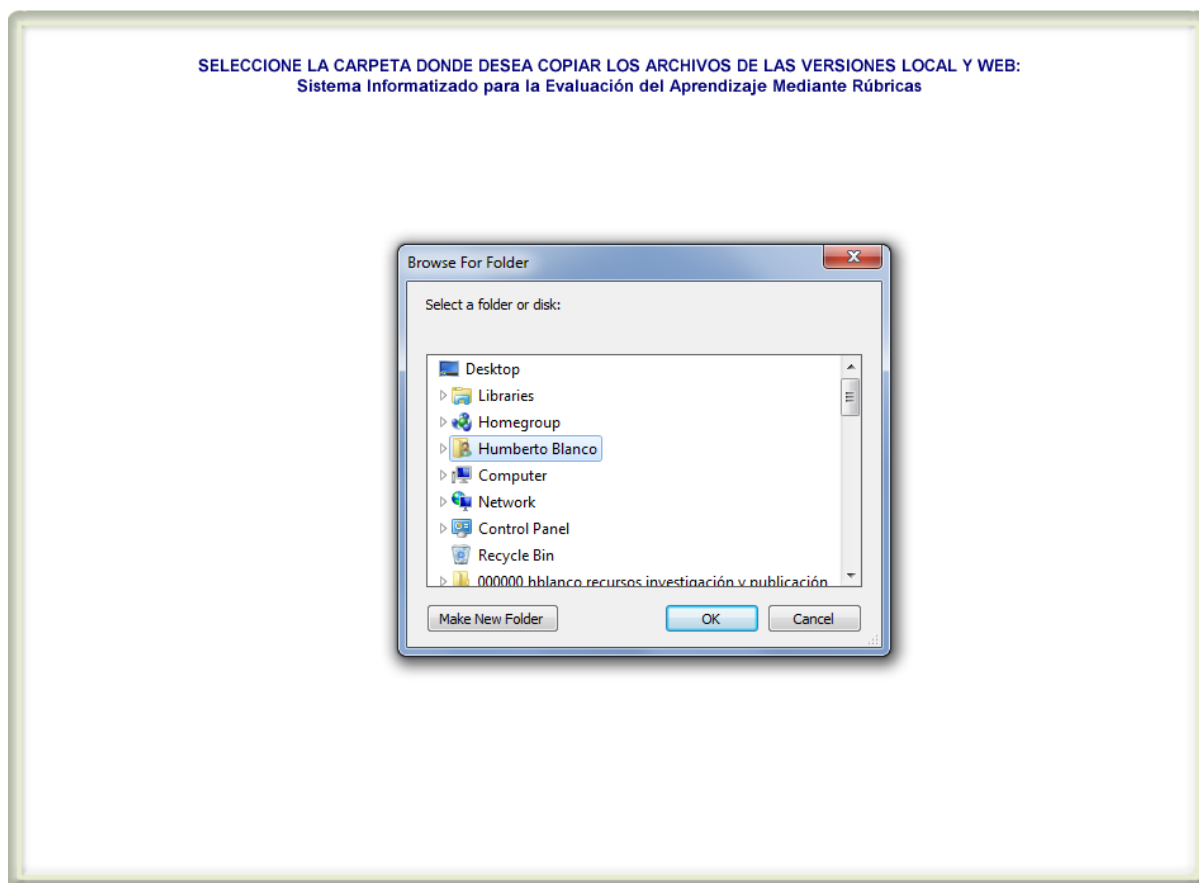


Figure 6. Screen: Where do you want to copy the files locally and web versions? Generator module system..

Step 3: You can see in **Figure 9** the self-assessments and/or co-student assessments and teacher evaluations for each performance evidence.

Step 4: Browse by the students and teacher reports on the results of evaluations, self-assessments and co-evaluations conducted; see **Figure 10**.

4. Conclusions

We believe that the main contribution of this type of software in the field of evaluation in education, basically represents a viable and effective computer use in the development, administration and scoring of assessment instruments example, which affects mainly the reliability of the data, besides the stage of collecting and reporting the results is carried out with relative ease and economy of time.

The Automated System for the Assessment of Learning Through Headings (SIEAR) favors the teaching-learning process because it acts as a guide, and improve the evaluation process as it allows him greater objectivity and transparency, making the tax assessment and not become a feedback tool that allows the student to have clear performance standards and discover specific aspects in which a greater effort must be made.

The SIEAR as such represents a good example of how the use of new technologies can become a differentiator in the process of learning assessment over traditional assessment practices by providing tools to use the resources of time and materials so more effectively and efficiently by both the teacher and the student. The prospects for new versions allow SIEAR thinking, among other things, expand the contents under assessment, and generate expert systems of correction.

Acknowledgements

This study is part of a project funded by the *Secretaría de Educación Pública-Subsecretaría de Educación Supe-*

NOMBRE DEL CURSO, DIRECTOR, GRUPO DE DISEÑO, REVISORES Y TIPO DE SECCIÓN.

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- Jeanette López Walle

Revisores:

- Humberto Blanco Vega
- Juan Cristóbal Barrón Luján

Tipo de sección:

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(a)

NOMBRES SECCIONES

Escriba el nombre de cada una de las Secciones.
Después de cada nombre oprima la tecla ENTER y para finalizar TAB.

Secciones:

- Unidad # 1
- Unidad # 2
- Unidad # 3
- Unidad # 4

ANTERIOR

SIGUIENTE

(b)

NOMBRE Y PUESTO DE CADA INTEGRANTE DEL DIRECTORIO

Escriba un nombre (utilice mayúsculas y minúsculas) y oprima la tecla ENTER.
En seguida el puesto (utilice puras mayúsculas) y oprima la tecla ENTER; y así sucesivamente.

M. C. Jesús Enrique Seáñez Sáenz
RECTOR DE LA UACH
M. D. Saúl Arnulfo Martínez Campos
SECRETARIO GENERAL DE LA UACH
Dr. Alejandro Chávez Guerrero
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COORDINADORA DE LICENCIATURA EN MOTRICIDAD HUMANA
M. C. Ramón Candia Luján
COORDINADOR DE LICENCIATURA EN EDUCACIÓN FÍSICA

ANTERIOR

SIGUIENTE

(c)

ALTAS Y MODIFICACIONES
Docentes

Por favor, escriba el APELLIDO PATERNO del profesor, y enseguida oprima la tecla TAB o la tecla ENTER.

AGREGAR

Paterno	Materno	Nombre	No. Emp.
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ELIMINAR

ORDENAR

ACTUALIZAR

ANTERIOR

SIGUIENTE

(d)

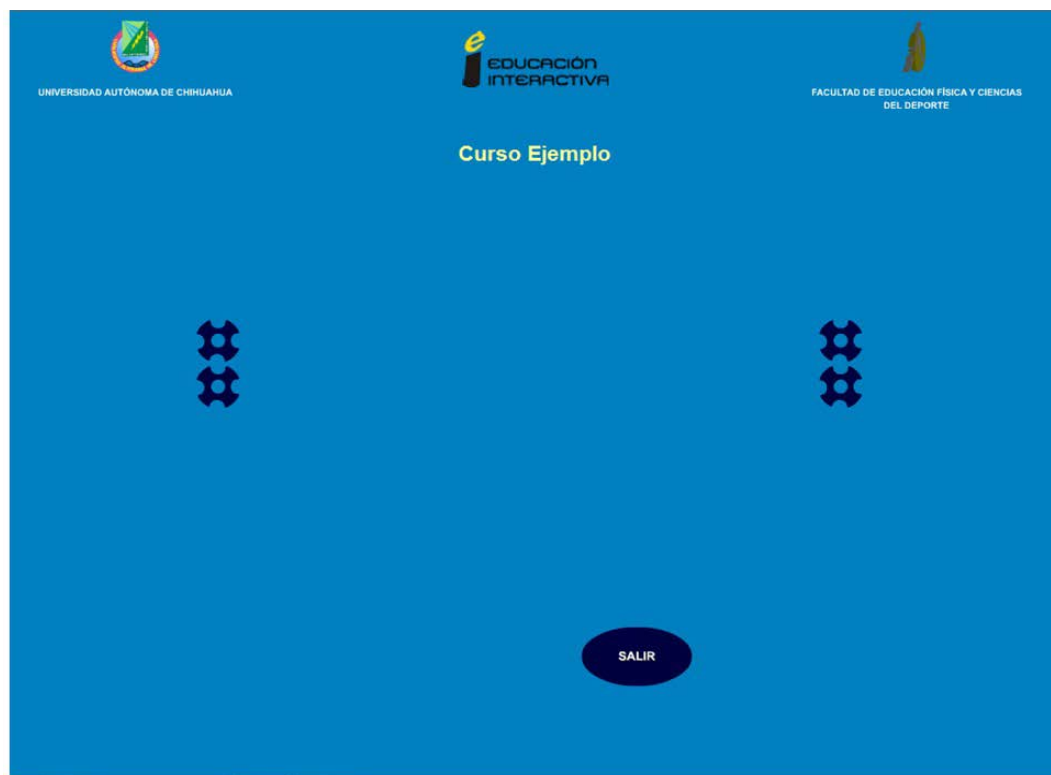
ALTAS Y MODIFICACIONES

Alumnos

Por favor, escriba el APELLIDO PATERNO del alumno, y enseguida oprima la tecla TAB o la tecla ENTER.

Paterno	Materno	Nombre	Matrícula

(e)



(f)

Figure 7. Screens of builder module course structure (part one).

EDITOR PARA EVALUACIÓN DE EVIDENCIAS DE DESEMPEÑO

Evaluación Individual

Evaluación Equipo

Autoevaluación Individual

Autoevaluación Equipo

Coevaluación Individual General

Coevaluación Equipo General

Coevaluación Individual Parcial

Coevaluación Equipo Parcial

Actividades

Evidencias

Finalizar Diseño

Valoraciones Diseñadas

(a)

ACTIVIDADES PARA: UNIDAD # 1

Escriba el nombre de cada una de las actividades para el Objeto de Estudio: UNIDAD # 1
Después de cada nombre oprima la tecla ENTER y para finalizar seleccione el Botón Actualizar.

Regresar

Actualizar

(b)

ACTIVIDADES Y EVIDENCIAS PARA: UNIDAD # 1

Actividades:

Actividad 1. Unidad # 1
 Actividad 2. Unidad # 1

Escriba la descripción para la evidencia seleccionada
 Al terminar oprima el botón Actualizar.

Nombre de la evidencia:

Evidencia 2 de la Actividad 1

Evidencias:

Evidencia 1 de la actividad 1

Descripción de la evidencia:

Esta es la descripción de la evidencia de la actividad 1 de la unidad 1

Eliminar

Reemplazar

Guardar

Regresar

Actualizar

(c)

Valoraciones 1

Tipo EI

Valoración # 1

Tipo de Valoración Elegida: Evaluación Individual

Seleccione el nombre de la evidencia de desempeño para la que va a diseñar la valoración
 Al terminar oprima la tecla TAB.

Actividades:

Actividad 1. Unidad # 1
 Actividad 2. Unidad # 1

Evidencias:

Evidencia 1 de la actividad 1

Rúbricas:

CESUES: Paráfrasis
 CESUES: Cuestionario
 CESUES: Entrevista

Descripción de la evidencia:

Esta es la descripción de la evidencia de la actividad 1 de la unidad 1

Fecha de término:

October 2013

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

October

2013

Asignar

Valoraciones

Eliminar

Nueva

Actualizar

Finalizar

(d)

GENERAR EQUIPOS PARA:

Actividad 1. Unidad # 1

Evidencia 1 de la actividad 1

Escriba o seleccione el número de equipos para la valoración que está diseñando

Al terminar oprima la tecla TAB.

Alumnos Inscritos:

4

No. Equipos:

2

Método:

Aleatorio

No Aleatorio

Clonación

Regresar

(e)



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EDUCACIÓN INTERACTIVA



FACULTAD DE EDUCACIÓN FÍSICA Y CIENCIAS DEL DEPORTE

CURSO EJEMPLO

PARA AGREGAR UNA RÚBRICA:

Escriba el nombre de la rúbrica y seleccione AGREGAR.

PARA MODIFICAR EL NOMBRE DE UNA RÚBRICA:

Seleccione el nombre de la rúbrica haciendo clic encima de él, realice la modificación y luego oprima el botón EDITAR.

CESUES: Paráfrasis

CESUES: Cuestionario

CESUES: Entrevista

Agregar

Editar

Finalizar

(f)

Figure 8. Screens of builder module course structure (part two).

1102



Figure 9. Screens of learning assessment module..



Figure 10. Screens of evaluation reports.

rrior-Dirección General de Educación Superior Universitaria de México [Mexican Ministry of Education-Department of Higher Education-General Directorate of the University Education] (OF-13-6894). Additionally, the third author is supported by a grant from the *National Council of Science and Technology of Mexico* (Conacyt).

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