ACADEMIA | Letters

RETHINKING TEACHER COMPETENCIES OF THE 21ST CENTURY

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The competencies paradigm has dominated educational policy in teaching, learning, and assessment in the last two decades. However, since its inception, it is known that this educational paradigm has been questioned for lacking, among other things, solid cognitive and pragmatic foundations [1, 2, 3]. On the other hand, when promoting generic or transversal competencies, the interests are directed to develop them in the students. Instead of in teachers, didactic competencies or the so-called digitization of teaching is the focus point [3]. But what about generic competencies in teachers? Can the teacher teaches what he has not developed in himself?

Even though the answer to this question is a truism –because it is known that no one can teach something he does not know¾, in the practical reality of many countries that aspire to social and economic development, this obviousness is overlooked. This panorama has led us to establish three interlocking discussion points from which rethink the pillars of teacher training for the 21st Century: 1) Vindication of teacher career; 2) the relevance of teaching basic disciplinary concepts, and 3) a different approach for teaching training from a competencies model according to the challenges of this Century. Simultaneously with the reflection of these points, we are designing our teaching training alternative proposal for its soon implementation [5, 6, 7, 8, 9].

Academia Letters, August 2021

Corresponding Author: Andrés Fraguela Collar, fraguela@fcfm.buap.mx
Citation: Fraguela Collar, A., Rosas Colín, C.P. (2021). RETHINKING TEACHER COMPETENCIES OF THE 21ST CENTURY. *Academia Letters*, Article 2744. https://doi.org/10.20935/AL2744.

1. Vindication of Teacher Career

One of the benefits that social confinement has brought because of the pandemic is that, by forcing the transfer of school-based education to homes, the awareness of teachers' relevance has been unintentionally triggered. The authorities, the parents, and even the students themselves have valued more the teachers' work. The situation has made us appreciate that success in teaching goes beyond the digitization of didactics [4]; it has to do with the teacher and what he does in an integral way as a person. It is about how he faces change, challenges, and how he proposes and restructures what, with what, and how to do it. Therefore, it has to do with the background that gives sustenance and orientation to the proceedings. In fact, that is the primary meaning of a model of competencies; they have to come out in day-to-day life; they have to be reflected in their thinking, saying, and actions, whether in the material world or the virtual world.

Thus, we agree to demand quality work from teachers with updated knowledge, but not without training and development opportunities. The idea is to offer solid initial training and guarantee teaching as a lifelong learning process to achieve positive impacts and guarantee attractive and fair incentives according to the level of performance and their students' academic achievement. We propose this approach for the 21st Century teachers as O + E + I (Opportunities + Demand + Incentives).

The O + E + I constitutes the guiding principle of what one of us has proposed as the basis to create a National System of Elementary Teachers and Highschool Education (SINAMEM for its acronym in Spanish.) [7]. It is a personalized, lifelong training system based on a digital learning educational platform to professionalize elementary and high school teachers'. This platform would allow for user learning analytics, which would make it possible to identify strengths and areas of opportunity for personalized, lifelong training.

These learning analytics also could serve as the foundation for a voluntary assessment of teachers. We are interested in a non-punitive evaluation of teacher's performance comparable to the so-call Researchers National System in Mexico of the National Council for Science and Technology (SNI-Conacyt for its acronym in Spanish.), which, according to a periodic assessment of the training, experience, productivity, and trajectory of the interested parties, are categorized to get extra incentives to their base salary, as well as to certain academic privileges according to the level of performance they obtain [10].

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2. Teaching Basic Disciplinary Concepts

Since the internet has provided general public access to academic, scientific, and technological information, knowledge development speed has increased. This situation has led to the erroneous equating of technological obsolescence with the obsolescence of knowledge [11, 12]. Several points invalidate this analogy, but they need not be addressed here [9]. Suffice it to say here that the way we conceive the nature of knowledge and how it develops determines whether it can become outdated or, on the contrary, if it is imperishable, as we consider it. Undoubtedly, the concept of the obsolescence of knowledge invites an epistemological debate. However, more important now is to underline that it has brought unfortunate pragmatic consequences that we must discuss—for instance, the lack of relevance in curricular content.

Many educators in Iberoamerica diminished the importance of disciplinary concepts reflected in curricular content, waving the flag of the obsolescence of knowledge [12], and instead exalt the role of skill and attitude. Nevertheless, teaching concepts matters because they are the heritage and foundation of current human civilization. This situation is a grave mistake; the reason is simple: the basic concepts of a discipline will always be valuable because, from them, we question, confirm, refute, reconsider, and develop new approaches. How to pretend to build with no foundations? Then the point is to understand what we mean when we ask teachers for their updating knowledge. It does not tell that we believe in the obsolescence of knowledge [9,12]; far of it. From our perspective, it is necessary to ask teachers to update knowledge, which requires a solid conceptual base as well as general culture and experience in other primary fields. Likewise, the teacher must think about how humanity passes from one state of knowledge to another and transmit said reflection to the students.

However, to achieve this –we insist, teaching requires, in the first place, to include the disciplinary concepts and link them to each discipline and between disciplines while providing strategies and tools that allow the application of knowledge to solve problems in different contexts. What we demand to teachers is in no way erudition. The contrary is the essential management of disciplinary concepts. It is nothing other than the crucial cultural-disciplinary heritage of the predecessor generations that sustains the current human civilization, and that has to be reflected in the curricular contents.

Then two questions emerge: Do teachers have this essential cultural-disciplinary heritage? Moreover, again: Can they transmit what they do not have? It is known that in the last Century, during many decades, curricular content was more relevant for educators than skills and attitudes. The downside is that they emphasized memory processes over rational processes. However, the failure lay in the memorizing processes, not in giving relevance to basic disciplinary concepts. We agree that the educational goal should not be erudition, understood as

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an accumulation of information from different fields only recited without criticism, creativity, or progress.

On the contrary, it is about the fundamental conceptual management of human knowledge fields that nurtures imagination and critical propositional thinking. In other words, the curricular contents are the raw material for the development of transversal skills and attitudes that favor the competitiveness of the population, both individually and collectively, enabling, among other things, their proactive participation in the society of the 21st Century. By the way, a society that faces the fourth industrial revolution aspiring to the knowledge economy not as users, but as generators of so-called highly intellectual products and services [13].

Concerning this and regarding the professions' future, some authors strongly emphasize that educational systems have to re-think the graduation profile, taking into account that the engine of the current knowledge society is innovation [13, 14, 15]. They, therefore, invite us to reflect how to achieve this goal. In our opinion, the foundation of the innovation lies precisely in a combination of competencies in which the disciplinary concepts reflected in the curricular contents are an essential component.

By the way, although contextualized examples of concrete, real-life situations are an indispensable part of teaching to motivate to learn the curricular contents, if we intend to promote innovation and generation of new knowledge just with them, we will not do it. The lack of conceptual rigor is an error since it only encourages mechanistic procedures and avoids the development of abstraction and generalization capacities that are essential to justify and unify methodologies for solving many different problems, precisely the necessary intellectual process for innovation.

In short, it is necessary to recover the value of the fundamental concepts of each discipline on which to continue building transgenerational knowledge. Now, how to pass from the theoretical to the practical proposal? Once the disciplinary concepts for elementary education have been re-defined, it is equally essential to rethink serialization: the order they should be taught and the connection between concepts to make comparisons, contrasts, and relationships to achieve an optimum comprehension level. Obviously, we should design didactic methods according to each group of disciplinary concepts. One of us applied this approach to design a training program for primary and high school mathematics teachers [5, 8].

3. Alternative Competencies Model for teachers training

In education, when speaking of competencies models, the proposals coincide in stating that it is about the acquisition and optimal application of knowledge, skills, and attitudes [1, 2, 5]. However, in practice, the teaching methodology emphasizes skills and attitudes over knowl-

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edge. Note that "knowledge" is used as a synonym for "curricular content" [1, 2, 3, 6, 9, 15]. We disagree on the following: the disciplinary concepts that we consider should make up the curricular content should not be regarded as synonymous with knowledge. Knowledge is the product of dynamism between conceptual resources, skills, and attitudes. Therefore, a competent person or society applies with skill and an accurate attitude, essential disciplinary concepts of human knowledge to face the challenges that life poses optimally.

From this perspective, we are rethinking the essential disciplinary areas for optimal Initial and Longlife Teaching Training—likewise, the disciplinary concepts necessary to teach and the didactic methodology to apply for teaching them. Based on the above, the alternative proposal that we have been developing [9] has been tentatively named *Model 7C-21* (Its student-focused analog is the *Model 7C-21e*). This Model consists of seven groups of competencies to be developed in the teaching staff initially and to refine permanently: 1) Logical-mathematical thinking, 2) Verbal reasoning, 3) Elementary scientific culture, 4) Critical and propositional reading-writing, 5) Global culture and environment, 6) Metacognitive and creative thinking to investigate, innovate and undertaking; and finally, 7) Vocational guidance and talent orientation.

Model 7C-21 conceives "competencies" as an alliance of essential disciplinary concepts, skills, and attitudes, acting integrally and optimally to face life's challenges. It supposes conceptual foundation strengthening and improving didactic methodology according to curricular contents (including digital tools to teach and evaluate learning). It also implies reflective practice: knowledge construction process, pedagogical foundations, learning management, and orientation processes from the point of view of integral educational counseling (healthy habits, values, civic, art, literature, sustainability, personal development, etcetera).

Currently, we are finishing the foundation of Model 7C-21 in contextual, theoretical, and pragmatic terms that we propose for a Initial and Longlife Teacher Training in the 21st Century, aimed at teachers of Elementary Schools and High School in Mexico, as well as levels equivalent in the context of Latin America and the Caribbean, and other regions in the world that seek their development from the improvement of education. We hope to be sharing this work soon with the members of Academia.edu to submit it for evaluation and criticism.

REFERENCES

[1] García, B., Loredo, J., Luna E. & Rueda, M. (2008). Modelo de evaluación de competencias docentes para la educación media y superior. Revista Iberoamericana de Evaluación Educativa, 1 (3), 86-108.

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[2] Westera, W. (2001). Competences in education: a confusion of tongues. Journal of Curriculum Studies, 23 (1), 75-88.

[3] Nessipbayeva, O. (2012). The competencies of the Modern Teacher. Bulgarian Comparative Education Society. Paper presented at the 10th Annual Meeting of the Bulgarian Comparative Education Society, Kyustendil, Bulgaria, Jun 12-15, 148-154.

[4] Griban, O. N., Griban, I.V. & Korotun, A.V. (2019). Modern teachers under de conditions of digitalization of education. Advances in Economics, Business and Management Research, 8, 605-608.

[5] Fraguela Collar, A. (2018). Programa Integral para la Formación de Docentes en Matemáticas: PIFMA- EB y PIFMA-EMS (material inédito). Facultad de Ciencias Físico Matemáticas, BUAP, México.

[6] Fraguela Collar, A., Rosas-Colín, C.P., Brambila Paz, F. & Aquino Camacho, F.A. (2018). Marco de Referencia: Competencias lógico-matemáticas para el ingreso a la Educación Superior (material inédito). Facultad de Ciencias Físico Matemáticas, BUAP, México.

[7] Fraguela Collar, A. (2018). Programa Integral para la Formación de Maestros: PIFMA. Aprender a Enseñar para Enseñar a Aprender (material inédito). México: ELUMEE Group & PIFMA.

[8] Fraguela Collar, A. y Rosas-Colín, C. P. (en prensa). Enseñanza de las Matemáticas: el Modelo PIFMA. México.

[9] Fraguela Collar, A. y Rosas-Colín, C. P. (en prensa). Fundamentos para la formación integral del docente del siglo XXI. México.

[10] Consejo Nacional de Ciencia y Tecnología –CONACY- (vigente 2021). Sistema Nacional de Investigadores > ¿Qué es el CONACYT? > Inicio. México: Gobierno de México. Recuperado el 02 de marzo del 2021 de: https://www.conacyt.gob.mx/Sistema-nacional-de-investigadores.html#

[11] Dominici, P. (2019). Educating for the Future in the Age of Obsolescence. IEEE 18th International Conference on Cognitive Informatics & Cognitive Computing (ICCI*CC), Milan, Italy, pp. 278-285, doi: 10.1109/ICCICC46617.2019.9146030.

[12] Neves, M., González, L.E. & Orozco, C. (2017). Obsolescencia del conocimiento o caducidad de la producción académica y científica. ARJÉ. Revista de Postgrado FACE-

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UC, 12 (22), 256-264.

[13] Fajar Hendarman, A. & Hidajat Tjakraatmadja, J. (2012). The relationship among Soft Skills, Hard Skills, and Innovativeness of Knowledge Workers in the Knowledge Economy Era. Procedia. Social and Behavioral Sciences, 52, 35-44.

[14] Openhaimer A. (2018) ¡Sálvese quien pueda! El futuro del trabajo en la era de la automatización. Penguin Random House, Grupo Editorial.

[15] Alake-Tuenter, E., Biemans, H. J.A., Tobi, H., Wals, A.E.J., Oosterheert, I. & Mulder, M. (2012). Inquiry-Based Science Education Competencies of Primary School Teachers: A literature study and critical review of the American National Science Education Standards. International Journal of Science Education, 34 (17), 2609-2640.

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