Critical issues of teaching innovations for vocational teachers: a literature review

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Abstract. This study aims to examine a literature review on teaching innovations that in part continue to sustain certain key aspects namely curriculum and assessment innovations, innovational instructions, innovative pedagogical strategies, technological innovations, and innovative teaching materials. As critical issues in current trends of vocational education and training (VET), these componential parts determine how vocational teaching innovations are set to enhance breakthroughs in terms of student-centered learning and teaching activities, and to what extent technology-based interactions should not abandon a humanistic approach involving direct social interactions and engagement. The results of article reviews show that teaching innovations seek to promote vocational teachers’ professional services, so that they actively advance technological skills, competencies and digital technologies in the digital era (45%). Another finding also leads to an institutional policy that teaching innovations need massive changes in the online pedagogical dimension (30%) fully supported by technological devices within a conducive atmosphere of learning and teaching processes. In another perspective, vocational teachers play a vital role in implementing the curriculum and literacy development through contextual projects, cultural awareness and curriculum development (20%). In contrast, only one article (5%) reviews how a competency-based performance assessment obviously contributes to the students’ competence and teaching innovations. Regardless of this fact, vocational teachers are agents of innovations who keep prioritizing better academic development and innovative professional services.

1. Introduction

The concepts of teaching innovations in vocational schools have triggered a large amount of scientific inquiry. As an integral part of a global trend and demand, educational practices must be put into the framework of innovations particularly in an absolute sense of teaching innovativeness. What is remarkable about teaching innovativeness is that it clearly links to the personal innovativeness aiming at representing a significant development in information technology innovation including the Twitter technology through which users obtain several benefits namely daily conversations, shared information, knowledge and news reports (Java et al., 2007; as cited Alajmi, Alharbi, and Ghuloum, 2016). In this respect, more emphasis is required to frame the long-term efficacy and contributions of innovations to teaching mechanisms that encourage teachers to be more creative, skillful, cooperative, and competitive in undertaking their professional job.

The purpose of this review article is to overview critical issues pertaining to teaching innovations in the context of vocational teachers. Up to now, pre-eminent studies on this area of concern have
confirmed distinctive effective results. Mahdi, Sukarman, and Yok (2015), for example, demonstrate that teaching innovations stimulate the teacher’s creativity and critical thinking skills in performing teaching activities resulting in increased communication skills, teamwork, personal development, problem-solving skills, and intellectual motivation. Hence, it can be assumed that an innovation is likely a gateway to creative and innovative engagement in which the teaching of science subjects essentially is integrated into the landmark of sustainable technology education.

Similarly, innovation in charter schools focuses on competitions and a propensity toward innovative practices for vocational students. In contrast, “traditional public schools implement every new instructional reform, strategy, and program that comes down the pipeline and are constantly changing their practices” (Bulkley and Fisler, 2003; as cited in Preston, Goldring, Berends and Cannata, 2012). While such researchers identify the school innovation in district context as a salient dimension of arguments, Kirkgoz (2009) is much more concerned with a curriculum innovation at the vocational higher education as to maintain an innovative quality of prospective vocational teachers.

2. Review of literature

2.1. Curriculum and assessment innovations

After all, some evidence indicates that curriculum designers are likely to foster the curriculum innovation. Whether suddenly or gradually, it uncovers a plethora of theories and systematic ways of curriculum development involving participants, decision makers, curriculum planners, designers and adopters (Kirkgoz, 2009). In recent years, this curriculum innovation has been an entryway to transformations in terms of communication skills, media provision, infrastructure, monitoring, and evaluation.

It can be viewed from Kirkgoz’s notion that curriculum innovation works in tandem with relevant standards worth considering. For example, a technical emphasis on IT-based curriculum draws on software development and the use of best practices for system configuration, hands-on learning experiences and information technology course (Peltsverger and Zheng, 2016). Another principal factor of innovation that has surprisingly emerged in physical literacy curricula entails skills, performance, knowledge application and the likelihood of innovative knowledge transfer in different interdisciplinary fields. In addition, the growing concern of this research is evidently in line with knowledge transmission and curriculum-based activities in the United States or Western countries associated with literacy, knowledge transfer, skills, knowledge application and knowledge innovation (Kirkgoz, 2009). Thus, curriculum innovation seeks to provide teachers with a set of standards, IT-oriented curriculum designs, and knowledge-sharing innovations.

The same articulation on innovation brings forth “a professional community of practice in the organization” (Weitze, 2017) in the form of continuous competent development method that enables teachers to collaborate and develop innovative learning designs for students in a new hybrid synchronous video-mediated learning environment. Other existing issues for teacher education become increasingly concerned with innovative practices and initiatives, technological and humanistic innovations (Tatebe, 2016), the new video conferencing technology, learning innovations beyond knowledge innovation processes in a teacher’s daily work and competence for pedagogical innovations for future teacher teams (Weitze, 2017).

The main strength of Weitze’s study is the inclusion of teachers’ efforts to develop knowledge, competence, values and the following sidelines of critical issues to explore considerably: Technology-enhanced learning environments (TELEs), innovative learning designs, innovative use of educational technology, professional theoretical literature (articles, edu-blogs, videos, and so on) in the
fields of pedagogy, pedagogical innovation, teacher competence development, technological literacy, and other relevant subject areas (Weitze, 2017).

More broadly, another research on an assessment innovation (Gulikers, Runhaar, and Mulder, 2017) marks the beginning of a management system for innovative practices that spurs quality-oriented performances of learning and teaching in vocational education institutions, as evidenced in the following table.

**Table 1. Core assessment of authentic competence-based performance (adapted from Gulikers, Runhaar & Mulder, 2017)**

| No | Core components                | Descriptions                                                                                                                                 |
|----|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Generic competence             | Students are able to collaborate, communicate/present, and show basic competence to support ICT skills, knowledge, and professional expertise concerning satisfactory services to the customers. |
| 2  | Basic competence performance indicators | Knowledge  
Students are able to comprehend calculations of costs, products arrangements, packaging of tools and materials, and cash registrations.  
Skills  
Students are able to handle invoices, serve customers, manage certain products arrangements, and cash registrations.  
Attitudes  
Students are able to show hospitality, good attitudes and communication skills, sincerity, respect, dignity, and active participation. |

Table 1 shows a classification of core assessment components with respect to authentic competence-based performance for vocational teachers. Prior to the work of Gulikers, Runhaar, and Mulder (2017), the role of such a core assessment is largely dedicated to analyzing curricular innovations in general, and the language didactics (Mâţă and Suciu, 2014) focusing on new knowledge, open environments, flexible learning, and new educational technology. It requires expertise, complete multimedia, communication skills, creative, high order, and critical thinking skills (Hernandez and Villasenor, 2015).

To better understand curricular innovations, Llorent (2012) takes into account greater adaptability and responses to change because of flexible, and diverse challenges, and social development. It is based on innovative strategies for an entrepreneurial plan, such as self-development, the existence of inventive systems, a labor integration resource, tutorial activities, pedagogical guidance on simulated situations, growing economic pedagogy, and the evaluation of teaching innovations as a determining aspect of effective teaching, and assessment practices (Cameron, Colander, and Hedges, 2013).

One possible implication for this pedagogical purpose (Farrell and Jacobs, 2010) is that innovations not only deliver renewal curricular breakthroughs and assessment practices, but also a three-channel teaching innovation diffusion strategy (Whalen and Coker, 2016) that particularly deals with how presenters in conferences can communicate and present chosen topics in meetings. Another fact is that pedagogical practices take advantage of motivation building, enthusiasm, ICT and digital media in applying teaching innovations.

In this sense, the scope of such discussions is likely to rearticulate how innovations are applied for teaching methods, designs, and assessments of teaching materials that are subject to innovative attempts.
and strategies (Shaw, Fisher & Southey, 1999). This notion implies that innovations become a gateway to academic efficacy, and professional performance in that students and instructors maintain time management or integration of research and practices based on the curriculum designs (Maschi, Wells, Slater, MacMillan & Ristow, 2013). The combination of innovations and academic performances paves the way for vocational teachers to build an expected atmosphere of quality learning and teaching. That is why, current educational concerns, particularly in marketing as to emphasize the vocational field, reflect teaching innovations in the form of practical but systematic assistance, challenges, students’ engagement and empowerment (Liao-Troth & Thomas, 2016).

2.2. Innovations-enhanced teaching breakthroughs

Innovations in a vocational teaching paradigm bring about changes in terms of instructions. Steffens, K., Bannan, B., Dalgarno, B., Bartolomé, A. R., Esteve-González, V., & Cela-Ranilla, J. M. (2015) highlight that innovational instructions deal with emerging technology-enhanced learning and teaching activities, and most of all, learning environment enriched with digital technological devices. As this notion is in the spotlight, Chawinga (2017) adds that to support teaching innovations, long-term learning should be achieved through independent learning, and the effective use of technological devices. To realize this, it is necessary to initiate reinforcement, extracurricular activities, social skills, practical learning, emotional support and cognitive aspect (Cerda-Navarro & Comas-Forgas, 2017).

A pedagogical strategy is another breakthrough under discussion that covers responsibility, autonomy (Mikkonen et al., 2017), and mechanisms that function well in co-learning processes to foster digital visual skills (Simsek & Erdener, 2012), and facilitate mobile learning, multitasking classroom and the class dynamic in ongoing collaborative processes (Pedro, Barbosa & Santos, 2018).

A pedagogical strategy extremely needs technological innovations and technologies for large-scale teaching that remove barriers of time and space (Sanchez-Gordon & Lujan-Moja, 2017), promote online collaborative learning (Fernandez-Ferrer & Cano, 2016), implement information and communication technologies (ICTs) (Palomino, 2015) and encourage teaching and curriculum innovation projects (Feixas, Martínez-Usarralde & López-Martín, 2018). These theories lead to two research questions: 1) the critical issues of teaching innovations that in turn shape the way teachers pursue a professional development, and 2) typical challenges of teaching innovations for vocational teachers in doing their job.

3. Method

This research used a literature review method in order to gain insight into a systematic mapping review for articles under study. Race (2008) holds a principle that a literature review sustains a wide variety of original ideas, approaches or interpretations that add to the enriched current literature. This is actually a basic reason behind the comprehensive topic of teaching innovations afforded by vocational schools in the last five years. This consideration is particularly useful to map out critical issues in question.

First, the area of study was relatively limited to the critical issues of teaching innovations for vocational teachers bound up with the research timeframe, so the researcher chose 20 articles to pay close attention to. The extent number of articles can provide the topic coverage and thorough review.

Second, in order to understand how each article uncovers critical issues of teaching innovations for vocational teachers, a series of activities were undertaken, i.e., reviewing articles one by one or step-by-step to identify and explore their emerging relevance to the research topics (an initial review). It also seeks to map out and categorizes the quantity and quality of such articles from which pertinent studies
and focal points can easily be traced following the intense search for keywords, including critical issues, teaching, innovations, vocational and teachers (a limited review).

The review articles were derived from several archived journals and the Google Scholar database relevant to teaching innovations and vocational teachers’ features. The collected review articles were analyzed using a matrix of data involving specific information on the studies, critical issues of teaching innovations, methods of the studies (an in-depth analysis to answer the first research question), as shown in the table below.

Table 2. A sample matrix of article reviews

| Studies | Critical issues of innovations | Research Methods |
|---------|-------------------------------|------------------|
| Hepp, Fernandez & Garcia (2015) | Teaching innovations in terms of digital, technologies and teachers’ professional development | Critical review |
| Khatri, Henderson, Cole, Froyd, Friedrichsen & Stanford (2017) | Schemes of teaching innovations: changes in pedagogy (teaching theories and practices) and the course contents. | Qualitative |
| Sanchez-Gordon & Lujan-Mora (2017) | Use of technological innovations through massive open online courses (MOOCs) | Quantitative |

Besides, the researcher determined challenging aspects for vocational teachers in stimulating the embodiment of teaching innovations, and a number of articles mainly focus on the issues and references (an in-depth analysis to answer the second research question).

Table 3. A sample matrix of teaching innovations based on the article reviews

| Teaching innovations | The number of articles | References |
|----------------------|------------------------|------------|
| Teaching innovations and digital technologies | 9 | Hepp, Fernandez & Garcia (2015), Sanchez-Gordon & Lujan-Mora (2017), Whalen & Coker (2016), Hostetter (2017), Mahdi, Salmah & Yok (2015), Lawrence (2017), Liao-Troth & Thomas, (2016), Tanner & Whalen (2013), Choomlucksana & Doolen (2016) |
| A scheme of pedagogy, online learning and teaching | 6 | Khatri, Henderson, Cole, Froyd, Friedrichsen & Stanford (2017), Weitze (2017), Cameron, Colander & Hedges (2013), Fernandez-Ferrer & Cano (2016), Tate, Campbell-Meier & Sudfelt (2018), Steffens, Bannan, Dalgarno, Bartolomé, Esteve-González & Cela-Ranilla (2015). |
4. Results and Discussion

In this section, articles that explore critical issues of teaching innovations may vary, but they represent different theories and practices. A critical review study by Hepp, Fernandez, and Garcia (2015) shows how teaching innovations necessarily come up with digital technologies and teachers’ professional development. As a good practice in modern education, innovations always transform human academic activities into massive open online courses (MOOCs) along with other technological breakthroughs (Sanchez-Gordon & Lujan-Mora, 2017). Most of all, the schemes of teaching innovations display changes in pedagogy (teaching theories and practices) and course contents (Khatri, Henderson, Cole, Froyd, Friedrichsen & Stanford, 2017).

Similarly, Weitze (2017) emphasizes the importance of pedagogical innovations for the sake of teacher team’s collaboration in terms of academic activities to develop both teachers’ and students’ competence. To support this notion, classroom-based innovations should start from technology applications, social media, fun courses, fast-moving learning and teaching sessions (Whalen & Coker, 2016), and innovation adoption within a scope of collaboration and meaningful content of teaching activities (Gray, 2001). Notwithstanding, teaching innovations are evidently related to pedagogy and its evaluations (Cameron, Colander & Hedges, 2016). Instead of managing the pedagogy-oriented innovations, learning and teaching activities in vocational schools can initiate online collaborative learning (Fernandez-Ferrer & Cano, 2016) through which students use internet-based pedagogical devices and infrastructures.

In addition, massive open online courses (MOOCs) become an integral part of such innovative practices in a wide variety of university courses through which prospective vocational teachers prepare themselves for their future jobs. This is one of the current trends in developing countries whereas students use Twitter as a means of learning in the context of cutting-edge technology (Alajmi, Aharbi & Ghuloum, 2016; Mahdi, Salmah & Yok, 2015). Likewise, innovations in marketing concepts, and practices (Hostetter, 2017), innovations for teachers and institutional technologies (Lawrence, 2017), the classroom implementation of teaching innovations imperatively promote pedagogy, and classroom management (Tate, Campbell-Meier & Sudfelt, 2018), as described in the following table.

| No | Studies | Critical Issues of Innovations | Research Methods |
|----|---------|--------------------------------|------------------|
| 1  | Hepp, Fernandez & Garcia (2015) | Teaching innovations in terms of digital, technologies and teachers’ professional development | Critical review |
| 2  | Khatri, Henderson, Cole, Froyd, Friedrichsen & Stanford (2017) | Schemes of teaching innovations: changes in pedagogy (teaching theories and practices) and the course contents. | Qualitative |
| 3  | Sanchez-Gordon & Lujan-Mora (2017) | Use of technological innovations through massive open online courses (MOOCs) | Quantitative |
| 4  | Weitze (2017) | Pedagogical innovations for the sake of teachers’ collaboration | Experimental study |
| 5  | Whaten & Coker (2016) | Classroom-based innovations: technology applications, social media, fun courses, and fast-moving periods | Critical review |
| 6  | Cameron, Colander & Hedges (2013) | Teaching innovations in evidence-related pedagogy and its evaluations. | Empirical |
In fact, curriculum innovations in chemical engineering, sciences, and mathematics (Hernandez & Villasenor, 2015) provide students with excellent patterns of curriculum designs, infrastructure support, and the instructors’ guidance. Mata and Suciu (2015) argue that innovation-based curricula involve language didactics in which the transfer of knowledge sheds light on social interactions, development of language and communication skills. Kirkgoz (2009) adds that a foreign language curriculum needs innovations that depend fully on software provisions and development including the best practices of

| ID | Author(s)                                      | Description                                                                                                | Methodology                 |
|----|-----------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------|
| 7  | Fernandez-Ferrer & Cano (2016)                | Internet-based pedagogical innovations: promote online learning collaboratively                            | Quantitative                |
| 8  | Feixas, Martínez-Usarralde & López-Martín (2018) | Implementation of teaching and curriculum innovation projects, teaching team and learning culture awareness | Quantitative                |
| 9  | Hostetter (2017)                              | Cutting-edge teaching innovations in marketing using social media, websites, etc. to attain the objectives of curricula. | Qualitative                 |
| 10 | Mâţă and Suciu (2014)                         | Innovations-based curricula involving language didactics                                                 | Qualitative                 |
| 11 | Hernandez & Villasenor (2015)                 | Curriculum innovations in chemical engineering, science and mathematics                                  | Comparative study           |
| 12 | Mahdi, Salmah & Yok (2015)                    | Innovations in sciences and technology education                                                        | Quantitative                |
| 13 | Gulikers, Runhaar & Mulder (2017)             | Managing competency-based performance assessment in VET institutions                                    | Qualitative                 |
| 14 | Liao-Troth & Thomas (2016)                    | The marketing concerns to develop the vocational field, and teaching innovations through students’ practices, challenges, and direct engagement | Qualitative                 |
| 15 | Lawrence (2017)                               | Innovations for teachers and institutional technologies                                                | Longitudinal study          |
| 16 | Tate, Campbell-Meier & Sudfelt (2018)         | Classroom implementation of teaching innovations: promoting pedagogy and management                     | A case study                |
| 17 | Tanner & Whalen (2013)                        | Teaching innovations to generate classroom behaviors: critical thinking skills, enhancement of professional career development, cultural awareness and branding | Critical review             |
| 18 | Steffens, Bannan, Dalgarno, Bartolomé, Esteve-González & Cela-Ranilla (2015) | Innovations in terms of digital technology-riched learning environments, MOOCs, the ecology of learning and technology-enhanced learning | Critical review             |
| 19 | Choomlucksana & Doolen (2016)                 | Teaching innovations: learners’ characteristics in terms of self-efficacy and background knowledge, collaboration and simulation activities | Quantitative                |
| 20 | Ennis (2015)                                  | Innovations in physical literacy curricula: knowledge for performance, ability to apply knowledge and use knowledge for innovations | Critical review             |
advanced technologies (Peltsverger & Zheng, 2016) and the transformation of science teaching innovations involving students’ positive attitudes (Gudiño Paredes, 2018).

Table 5. A matrix of teaching innovations based on the article reviews

| Innovations                          | The Number of Articles | References                                                                 | Percentage |
|--------------------------------------|------------------------|---------------------------------------------------------------------------|------------|
| Teaching innovations and digital technologies | 9                      | Hepp, Fernandez & Garcia (2015), Sanchez-Gordon & Lujan-Mora (2017), Whalen & Coker (2016), Hostetter (2017), Mahdi, Salmah & Yok (2015), Lawrence (2017), Liao-Troth & Thomas, (2016), Tanner & Whalen (2013), Choomlucksana & Doolen (2016) | 45%        |
| A scheme of pedagogy, online learning and teaching | 6                      | Khatri, Henderson, Cole, Froyd, Friedrichsen & Stanford (2017), Weitze (2017), Cameron, Colander & Hedges (2013), Fernandez-Ferrer & Cano (2016), Tate, Campbell-Meier & Sudfet (2018), Steffens, Bannan, Dalgaro, Bartolomé, Esteve-González & Cela-Ranilla (2015) | 30%        |
| Curriculum and literacy innovations | 4                      | Feixas, Martínez-Ussarralde & López-Martín (2018), Măţă and Suciu (2014), Hernandez & Villasenor (2015), Ennis (2015) | 20%        |
| Innovations in terms of competency-based performance assessment | 1                      | Gulikers, Runhaar & Mulder (2017)                                       | 5%         |
| Total                                | 20                     |                                                                          | 100%       |

Specifically, nine out of twenty articles (45%) show teaching innovations and digital technologies that dominantly highlight influential components in monitoring the sustainability of vocational education. In this case, instructors play an important role in planning, designing, managing, implementing, monitoring and evaluating the learning and teaching activities. In what follows, six articles (30%) arise from the issues that pedagogical, online and teaching dimensions are of paramount importance. The scope of these innovations is relevant to studies on pedagogical changes due to a transformative force of theories and practices involving teachers who consistently perform academic activities in digital learning and teaching environments. Accordingly, four articles (20%) reflect a way in which vocational teachers determine the implementation of curriculum and literacy innovations through academic projects, cultural understanding and curriculum development.

Yet, as a vital component to take into account, a competency-based performance assessment is merely responsible for 5% of teaching innovations in VET institutions. This assessment not only deals with collaborations and peer-feedback, but also fast-changing technological innovations and human values (Tatebe, 2016). The implication is that the absence of humans in handling technologies and systematic operations results in the loss of a humanistic approach. Learning opportunities are important to humans to appreciate the organizational leadership. Other humanistic practices in learning organizations and teaching innovations generate the power of learning innovations, collaborative teaching (Weitze, 2017), faculty-related knowledge and pedagogical innovations (Salas-Wright et al,
and sustainable improvement of teaching innovations through need-it-right-now learning environments, multitasking, peer learning and engagement (Matulich, Papp, & Haytko, 2008).

At the nexus of such issues, innovations have a structured pattern of principal assessment oriented to the competency-based performance for VET teachers (Gulikers, Runhaar and Mulder, 2017) and multimedia networking, communication skills and critical thinking skills (Hernandez & Villasenor, 2015). Curricular innovations call for flexibility, adaptability and response to social changes and challenges (Llorent, 2012). Therefore, teaching innovations require assessment practices (Cameron, Colander & Hedges, 2013), motivation building (Whalen & Coker, 2016) and socio-cultural dimensions of curricular innovations involving the school leadership, learning contexts, learning communities, and development of historicity and adaptivity (Lee & Hung, 2016).

5. Conclusion

Teaching innovations for vocational teachers in the digital era are subject to a transformation. Some critical issues behind this phenomenon entail curriculum and assessment innovations that to a certain extent focus on the use of information and communication technologies (ICTs), innovative knowledge sharing, learning innovations, and pedagogical strategies.

The use of technologies in learning and teaching activities is likely to uphold online courses, creative thinking and ongoing processes of a long-term orientation of learning namely designs of innovative curricula, teachers’ competencies and the provision of teaching materials.

Vocational teachers are key figures who develop a national education platform. Therefore, the availability of technological devices supported by quality vocational teachers in part leads to a transformative step in which teaching innovations result in the quality of innovative learning and teaching schemes. To this extent, students’ engagement and competencies are imperative to realize because they need to pursue knowledge and hone much-required skills in the 21st century such as communication, leadership, adaptability, collaboration, creativity, entrepreneurship, innovation, global citizenship, productivity, and accountability.

6. References

[1] Alajmi, M.A., Alharbi, A.H., & Ghuloum, H.F. (2016). Predicting the use of Twitter in developing countries: Integrating innovation attributes, uses and gratifications, and trust approaches. Informing Science: The International Journal of an Emerging Transdiscipline, 19, 2015-237.
[2] Cameron, M.P., Colander, D.C. and Hedges, M.R. (2013). Innovation in teaching undergraduate economics: An introduction to the special issue. New Zealand Economic Papers, 47:3, 225-226, DOI: 10.1080/00779954.785623
[3] Cerda-Navarro et al. (2017). Recommendations for confronting vocational education dropout: a literature review, Empirical Research in Vocational Education and Training, 9:17 DOI: 10.1186/s40461-017-0061-4
[4] Chawinga, W.D. (2017). Taking social media to a university classroom: teaching and learning using Twitter and blogs, International Journal of Educational Technology in Higher Education, 14:3 DOI: 10:1186/s41239-017-0041-6
[5] Choomlucksana, J., & Doolen, T. L. (2016). An exploratory investigation of teaching innovations and learning factors in a lean manufacturing systems engineering course. European Journal of Engineering Education, 42(6), 829–843. doi:10.1080/03043797.2016.1226780.
[6] Ennis, C.D. (2015), Knowledge, transfer, and innovation in physical literacy curricula. Procedia – Social and Behavioral Sciences, 4, 119-124
[7] Farrell, T.S.C. & Jacobs, G.M. (2010). Essentials for Successful English Language Teaching. London: Continuum International Publishing Group.

[8] Gudiño Paredes, S. (2018). Innovating science teaching with a transformative learning model. *Journal of Education for Teaching*, 44(1), 107–111. doi:10.1080/02607476.2018.1422619

[9] Hepp K., P., Prats Fernández, M. A, & Holgado García, J. (2015). Teacher training: technology helping to develop an innovative and reflective professional profile. *RUSC. Universities and Knowledge Society Journal*, 12(2), pp. 30-43. doi http://dx.doi.org/10.7238/rusc.v12i2.2458

[10] Feixas, M., Martínez-Usarralde, M.-J., & López-Martín, R. (2018). Do teaching innovation projects make a difference? Assessing the impact of small-scale funding. *Tertiary Education and Management*, 1–17. doi:10.1080/13583883.2017.1417470

[11] Fernandez-Ferrer, M & Cano, E. 2016. The influence of the internet for pedagogical innovation: using Twitter to promote online collaborative learning. *International Journal of Educational Technology in Higher Education*, 13: 22. DOI: 10.1186/s41239-016-0021-2

[12] Gray, K. C. (2001). Teachers’ Perceptions of Innovation Adoption. *Action in Teacher Education*, 23(2), 30–35. doi:10.1080/01626620.2001.10463061

[13] Gulikers, J. T. M., Runhaar, P., & Mulder, M. (2017). An assessment innovation as flywheel for changing teaching and learning. *Journal of Vocational Education & Training*, 70(2), 212–231. doi:10.1080/13636820.2017.1394353

[14] Hepp K., P., Prats Fernández, M. A., & Holgado García, J. (2015). Teacher training: technology helping to develop an innovative and reflective professional profile. *RUSC. Universities and Knowledge Society Journal*, 12(2), 30. doi:10.7238/rusc.v12i2.2458

[15] Hernandez, V.A.L. & Villasenor, E.L. (2015). Curricular innovation and emerging knowledge in chemical engineering in Mexico Study Comparative. *Procedia – Social and Behavioral Sciences*, 174, 3374-3377

[16] Hostetter, L. R. (2017). Teaching Innovations in Marketing: A Brand-Based Student-Led Inquiry of Marketing Concepts and Practices. *Marketing Education Review*, 27(2), 66–71. doi:10.1080/10528008.2016.1274633.

[17] Khatri, R., Henderson, C., Cole, R., Froyd, J. E., Friedrichsen, D., & Stanford, C. (2017). Characteristics of well-propagated teaching innovations in undergraduate STEM. *International Journal of STEM Education*, 4(1). doi:10.1186/s40594-017-0056-5

[18] Kirkgoz, Y. (2009). The challenge of developing and maintaining curriculum innovation at higher education. *Procedia – Social and Behavioral Sciences*, 1, 73-78

[19] Lee, S.-S., & Hung, D. (2016). A socio-cultural perspective to teacher adaptivity: the spreading of curricular innovations in Singapore schools. *Learning: Research and Practice*, 2(1), 64–84. doi:10.1080/23735082.2015.1132862

[20] Liao-Troth, S., & Thomas, S. P. (2015). Practicing What We Teach: Ten Years of Teaching Innovations. *Marketing Education Review*, 26(1), 1–2. doi:10.1080/10528008.2015.1091659.

[21] Lawrence, B. (2017). Innovating in the real world: exploring institutional effects on tertiary teacher innovations in New Zealand. *Distance Education*, 39(1), 54–68. doi:10.1080/01587919.2017.1413932.

[22] Llorent, V.J. (2012). Curricular innovations for proactive education. Social development from an individual initiative. *Procedia – Social and Behavioral Sciences*, 46, 3619-3623

[23] Mahdi, R., Sukarman, S.S.,Yok, M.C.K. (2015). Fostering creativity through innovation engagement in science and technology education: Case study of Universiti Teknologi MARA students. *Procedia – Social and Behavioral Sciences*, 167, 256-260

[24] Maschi, T., Wells, M., Yoder Slater, G., MacMillan, T., & Ristow, J. (2013). Social Work Students’ Research-Related Anxiety and Self-Efficacy: Research Instructors’ Perceptions and Teaching Innovations. *Social Work Education*, 32(6), 800–817. doi:10.1080/02615479.2012.695343
[24] Măță, L., & Suciu, A. I. (2014). Exploring the Possibilities of Curriculum Innovation in Initial Language Teacher Education. Procedia - Social and Behavioral Sciences, 116, 3281–3285. doi:10.1016/j.sbspro.2014.01.748

[25] Matulich, E., Papp, R., & Haytko, D. L. (2008). Continuous Improvement through Teaching Innovations: a Requirement for Today’s Learners. Marketing Education Review, 18(1), 1–7. doi:10.1080/10528008.2008.11489017

[26] Mikkonen et al. (2017). Guiding workplace learning in vocational education and learning: a literature review, Empirical Research in Vocational Education and Training, 9:9 DOI: 10.1186/s40461-017-0053-4

[27] Palomino, M.C.P. (2015). Teaching methodology used in the master’s degree program for secondary education teacher training: students’ assessment, Universities and Knowledge Society Journal, 12(1), 66-89. DOI: http://dx.doi.org/11.1111/ruscv11i1.111.

[28] Pedro, L. F. M. G., Barbosa, C. M. M. de O., & Santos, C. M. das N. (2018). A critical review of mobile learning integration in formal educational contexts. International Journal of Educational Technology in Higher Education, 15(1). doi:10.1186/s41239-018-0091-4

[29] Peltsverger, S. & Zheng, G. (2016). Enhancing privacy education with a technical emphasis in IT curriculum. Journal of Information Technology Education: Innovation in Practice, 15, 1-17.

[30] Preston, C., Goldring, E., Berends, M., & Cannata. (2012). School innovation in district context: Comparing traditional public schools and charter schools. Economics of Education Review, 31, 318-330.

[31] Race, R. (2008). Literature Review. In Given, L.M. (Ed). The SAGE Encyclopedia of Qualitative Research Methods Volumes 1 & 2 (pp. 487-489). London: Sage Publication Ltd.

[32] Salas-Wright et al. (2018). Teaching Social Work Students About Alcohol and Other Drug Use Disorders: From Faculty Learning to Pedagogical Innovation. Journal of Social Work Practice in the Addictions, 18(1), 71–83. doi:10.1080/1533256X.2017.1413983

[33] Sanchez-Gordon, S. & Lujan-Mora, S. 2017. Technological innovations in large-scale teaching: five roots on Massive Open Online Courses, Journal of Educational Computing Research, 0(0) 1-22 DOI: 10.1177/0735633117727597

[34] Simsek, B., & Erdener, B. (2012). Digital Visual Skills Education for Digital Inclusion of Elder Women in the Community. Procedia - Social and Behavioral Sciences, 46, 4107–4113. doi:10.1016/j.sbspro.2012.06.208

[35] Shaw, J. B., Fisher, C. D., & Southey, G. N. (1999). Evaluating Organizational Behavior Teaching Innovations: More Rigorous Designs, More Relevant Criteria, and an Example. Journal of Management Education, 23(5), 509–536. doi:10.1177/105256299902300505

[36] Steffens, K., Bannan, B., Dalgarno, B., Bartolomé, A. R., Esteve-González, V., & Cela-Ranilla, J. M. (2015). Recent Developments in Technology-Enhanced Learning: A Critical Assessment. RUSC. Universities and Knowledge Society Journal, 12(2), 73. doi:10.7238/rusc.v12i2.2453

[37] Tanner, J. F., & Whalen, D. J. (2013). Teaching Moments: Opening the Pipeline to Teaching Innovations. Marketing Education Review, 23(3), 265–274. doi:10.2753/mer1052-8008230305

[38] Tate, M., Campbell-Meier, J., & Sudfolt, R. (2018). Organizational routines and teaching innovations: a case study. Teaching in Higher Education, 23(7), 885–901. doi:10.1080/13562517.2018.1437132.

[39] Tatebe, J. (2016). Inspiration and innovation in teaching and teacher education. Journal of Education for Teaching, 42(2), 265-267. DOI: 10.1080/02607476.2016.1140463

[40] Weitze, C.L. (2017). Designing pedagogical innovation for collaborating teacher teams, Journal of Education for Teaching, DOI: 10.1080/02607476.2017.1319511

[41] Whalen, D.J. & Coker, K.K. (2016). Outside the Box Teaching Moments: Classroom-tested innovations. Marketing Education Review, 26;2, 119-123; DOI: 10.1080/10528008.1167521

[42] Whalen, D. J. (2017). Selections From the ABC 2016 Annual Conference, Albuquerque, New Mexico: Teaching Innovations Soaring Like a Flight of Balloons Over Albuquerque. Business
and *Professional Communication Quarterly*, 80(3), 379–401.
doi:10.1177/2329490617693351.