TEEM 2020 Preface

Francisco José García-Peñalvo

GRIAL Research Group, Research Institute for Educational Science, University of Salamanca

fgarcia@usal.es

The eighth edition of this International Conference on Technological Ecosystem for Enhancing Multiculturality – TEEM, was organized to be held again in Salamanca (Spain), the TEEM home, to which it returns every two years. However, the SARS-CoV-2 virus entered the scene, causing the pandemic of COVID-19 [1-5], and it was online on October 21st-23rd, 2020. Nevertheless, the idiosyncrasy and philosophy of this conference lead us to innovate in its format. It has been held in a virtual format, with videos of the presentations, open available in the papers in the conference website's video section (https://2020.teemconference.eu/papers-in-video/), and synchronous discussion sessions and keynote plenary activities, round tables, and gamified and interactive sessions, which have been recorded and accessible throughout https://2020.teemconference.eu/programme/.

This eighth edition maintains the same principles of the previous ones [6-12], an academic event with the goal to create and consolidate a research community around the Knowledge Society topic from an interdisciplinary perspective [13] and in which one the Ph.D. students [14-21] and novel researchers might have an excellent opportunity to do networking with other peers and to be in contact with consolidated researchers all around the world.

The first edition was very successful, with 83 full papers accepted and published in the ACM proceedings, which are yet indexed in WoS and Scopus, and several special issues published in international and well-ranked journals [22-32]. The Second TEEM edition, TEEM 2014, was held in Salamanca, Spain again. It meant the consolidation of the idea behind the conference. We grew in the number of submissions, 153, and we finally published 102 papers in the conference proceedings. Several special issues in international journals [33-37] were published too. The Third TEEM edition in 2015 was held in Porto, Portugal; it was the first edition that was organized out of the University of Salamanca, starting the series of one year out of the Salamanca scope one year in Salamanca. It was very significant for the maturity of the conference. 90 full papers were accepted to be published in the proceedings, and several special issues have been organized [38-41]. In 2016 TEEM returned to the University of Salamanca and it has received a fantastic respond of the researching community. We have received 235 submissions, of which 165 have been accepted as full papers that are available in these proceedings (30% rejection ratio). Following the association of TEEM with journals, these special issues were organized [42, 43]. The TEEM 2017 was held in the University of Cádiz (Spain), 109 submissions were received, of which 84 were accepted as full papers (23% rejection ratio), These special issues were organized [44, 45]. TEEM 2018 edition was held in Salamanca, 243 submissions have been received, and 151 full papers have been accepted (38% reject ratio), with three special issues associated in different journals [46-48]. TEEM 2019, the last edition, was held in Leon (Spain), 215 submission from which 148 full papers were accepted, that is, there is a 31.17% rejection rate. Associated to 2019 editions three special issues have been yet published [49-51]. The current edition, TEEM 2020, despite having finally been held online, has had 238 submission from which 159 full papers were accepted, that is, there is a 33.2% rejection rate. These papers have involved 437 authors from 26 countries.

The TEEM 2020 is organized in 15 thematic tracks:

- Track 1. Computational thinking and robotics in education [52].
- Track 2. Engineering Education: Professional Demands [53].
- Track 3. Bridging the diversity gap in STEM [54].
- Track 4. Implementation of Qualitative and Mixed Methods Researches [55].
- Track 5. Smart Learning [56].
- Track 6. Educational Innovation [57].
- Track 8. State-of-the-art technologies at the service of medical training and practice to foster Digital Health Ecosystems [58].
- Track 9. Advances on Sustainable Development in Higher Education [59].
- Track 10. Communication, Education and Social Media [60].
- Track 11. Gamification and Games for Learning (GAMILEARN) [61].
- Track 12. Learning analytics: A Time to Shine [62].
- Track 13. Evaluation and guidance in education [63].
- Track 14. Teacher Education for ICT integration in classroom [64].
- Track 15. Identity, technology and education. Identity construction processes in hyperconnected ecosystems [65].
- Track 16. Doctoral Consortium [21].

The computational thinking, engineering education, diversity, qualitative and mixed methods, artificial intelligence in education, educational innovations, education and medicine, sustainable development, communication, learning analytics, education assessment, teacher education and doctoral consortium topics are consolidated topics in TEEM Conference. On the other hand, we welcome Gamification and Games for Learning (GAMILEARN) and Identity, technology and education. Identity construction processes in hyperconnected ecosystems tracks.

The Conference has been opened with a keynote by Daniel Burgos entitled "Openness as the key factor to support education in times of crisis" [66], available at https://youtu.be/0vmV-tYfCBU. Besides, David Fonseca, Marc Alier and Patricia Sánchez-Holgado developed a

networking session to establish synergies and foster collaboration between researchers from different institutions [67], the recorded session is available at https://youtu.be/SUkl7lzJOwo.

I would like to thank the members of the Steering Committee for their counsel, the International Scientific Committee for their accurate and timely reviewing. I would also like to thank the Track Chairs for their efforts in organizing the academic issues related to each track, and the Organizing Committee for their huge effort in all the associated tasks that an international conference involves. I would like to do a special mention for the Editors-in-Chief of the linked journals that have offered special issues or slots in their regular issues for those selected and extended papers of TEEM 2020 conference that will have another in-depth review following the guidelines of each journal. Last, but not least, I would like to thank the participating organizations: University of Salamanca, Research Institute for Educational Sciences at the University of Salamanca, GRIAL Research Group [68, 69], and ACM for their support.

Next year, we will continue with Ninth Edition of TEEM Conference that will be held at Barcelona, Spain next 27-29 October 2021, organized by Universidad Politécnica de Barcelona and Universidad La Salle.

Salamanca, Spain, 11th November, 2020

Francisco José García-Peñalvo (TEEM 2020 Conference Chair)

References

[1] Sir John Daniel. 2020. Education and the COVID-19 pandemic. *PROSPECTS.* DOI:http://dx.doi.org/10.1007/s11125-020-09464-3.

[2] R. E. Ferdig, E. Baumgartner, R. Hartshorne, R. Kaplan-Rakowski, and C. Mouza (Ed.). 2020. *Teaching, Technology, and Teacher Education During the COVID-19 Pandemic: Stories from the Field.* Association for the Advancement of Computing in Education (AACE), Waynesville, NC, USA.

[3] F. J. García-Peñalvo and A. Corell. 2020. La COVID-19: ¿enzima de la transformación digital de la docencia o reflejo de una crisis metodológica y competencial en la educación superior? *Campus Virtuales* 9, 2, 83-98.

[4] F. J. García-Peñalvo, A. Corell, V. Abella-García, and M. Grande-De-Prado. 2020. Recommendations for Mandatory Online Assessment in Higher Education During the COVID-19 Pandemic. In *Radical Solutions for Education in a Crisis Context* Springer Nature. DOI:http://dx.doi.org/10.1007/978-981-15-7869-4_6.

[5] F. J. García-Peñalvo, A. Corell, V. Abella-García, and M. Grande-De-Prado. 2020. Online Assessment in Higher Education in the Time of COVID-19. *Education in the Knowledge Society* 21. DOI:http://dx.doi.org/10.14201/eks.23013.

[6] F. J. García-Peñalvo. 2013. *Proceedings of the First International Conference on Technological Ecosystems for Enhancing Multiculturality, TEEM 2013.* ACM, New York, NY, USA.

[7] F. J. García-Peñalvo. 2014. *Proceedings of the Second International Conference on Technological Ecosystems for Enhancing Multiculturality, TEEM 2014.* ACM, New York, USA.

[8] G. R. Alves. 2015. *Proceedings of the 3rd International Conference on Technological Ecosystems for Enhancing Multiculturality, TEEM 2015.* ACM, New York, NY, USA.

[9] F. J. García-Peñalvo (Ed.). 2016. *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'16) (Salamanca, Spain, November 2-4, 2016).* ACM, New York, USA.

[10] J. M. Dodero, M. S. Ibarra Sáiz, and I. Ruiz Rube (Ed.). 2017. *Proceedings of the Fifth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'17) (Cádiz, Spain, October 18-20, 2017).* ACM, New York, NY, USA.

[11] F. J. García-Peñalvo (Ed.). 2018. *TEEM'18 Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 24th-26th, 2018).* ACM, New York, USA.

[12] M. Á. Conde-González, F. J. Rodríguez-Sedano, C. Fernández-Llamas, and F. J. García-Peñalvo (Ed.). 2019. *TEEM'19 Proceedings of the Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality (Leon, Spain, October 16th-18th, 2019).* ACM, New York, USA.

[13] F. J. García-Peñalvo. 2015. Engineering contributions to a Knowledge Society multicultural perspective. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje (IEEE RITA)* 10, 1, 17-18. DOI:http://dx.doi.org/10.1109/RITA.2015.2391371.

[14] F. J. García-Peñalvo. 2013. Education in knowledge society: A new PhD programme approach. In *Proceedings of the First International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'13) (Salamanca, Spain, November 14-15, 2013),* F.J. García-Peñalvo Ed. ACM, New York, NY, USA, 575-577. DOI:http://dx.doi.org/10.1145/2536536.2536624.

[15] F. J. García-Peñalvo. 2014. Technological Ecosystems for Enhancing Multiculturality Doctoral Consortium. In *Proceedings of the Second International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'14) (Salamanca, Spain, October 1-3, 2014),* F.J. García-Peñalvo Ed. ACM, New York, USA, 627-631. DOI:http://dx.doi.org/http://dx.doi.org/10.1145/2669711.2669965.

[16] F. J. García-Peñalvo. 2015. Doctoral Consortium. In *Proceedings of the Third International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'15) (Porto, Portugal, October 7-9, 2015),* G.R. Alves and M.C. Felgueiras Eds. ACM, New York, USA, 619-621. DOI:http://dx.doi.org/http://dx.doi.org/10.1145/2808580.2808675.

[17] A. García-Holgado, F. J. García-Peñalvo, and M. S. Ramírez-Montoya. 2016. Education in the knowledge society doctoral consortium. In *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'16) (Salamanca, Spain, November 2-4, 2016),* F.J. García-Peñalvo Ed. ACM, New York, NY, USA, 1083-1087. DOI:http://dx.doi.org/10.1145/3012430.3012650.

[18] F. J. García-Peñalvo, M. S. Ramírez-Montoya, and A. García-Holgado. 2017. TEEM 2017 Doctoral Consortium Track. In *Fifth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'17) (Cádiz, Spain, October 18-20, 2017)*

J.M. Dodero, M.S. Ibarra Sáiz and I. Ruiz Rube Eds. ACM, New York, NY, USA, Article 93. DOI:http://dx.doi.org/10.1145/3144826.3145440.

[19] F. J. García-Peñalvo, A. García- Holgado, and M. S. Ramírez-Montoya. 2018. The PhD Corner: TEEM 2018 Doctoral Consortium. In *Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM 2018)* ACM, Salamanca, Spain.

[20] F. J. García-Peñalvo, A. García-Holgado, and M. S. Ramírez-Montoya. 2019. Track 16: TEEM 2019 Doctoral Consortium. In *TEEM'19 Proceedings of the Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality (Leon, Spain, October 16th-18th, 2019)*, M.Á. Conde-González, F.J. Rodríguez-Sedano, C. Fernández-Llamas and F.J. García-Peñalvo Eds. ACM, New York, NY, USA, 920-924. DOI:http://dx.doi.org/10.1145/3362789.3362958.

[21] F. J. García-Peñalvo, A. García-Holgado, and M. S. Ramírez-Montoya. 2020. Introduction for the TEEM 2020 Doctoral Consortium track. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[22] F. J. García-Peñalvo, A. Sarasa Cabezuelo, and J. L. Sierra González. 2014. Innovating in the engineering processes: Engineering as a means of innovation. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje (IEEE RITA)* 9, 4, 131-132. DOI:http://dx.doi.org/10.1109/RITA.2014.2363004.

[23] F. J. García-Peñalvo and R. Colomo-Palacios. 2015. Innovative teaching methods in engineering. *International Journal of Engineering Education (IJEE)* 31, 3, 689-693.

[24] F. J. García-Peñalvo. 2014. Informal Learning Management Experiences. *International Journal of Human Capital and Information Technology Professionals (IJHCITP)* 5, 3, iv-ix.

[25] F. J. García-Peñalvo. 2014. Managing the knowledge society construction. *International Journal of Knowledge Management* 10, 4, iv-vii.

[26] F. J. García-Peñalvo. 2014. Educational Innovation Successful Cases – Part I. *Journal of Cases on Information Technology* 16, 3, 1-3. DOI:http://dx.doi.org/10.4018/jcit.2014070101.

[27] F. J. García-Peñalvo. 2014. Educational Innovation Successful Cases – Part 2. *Journal of Cases on Information Technology* 16, 4, iv-vii.

[28] F. J. García-Peñalvo. 2014. Formación en la sociedad del conocimiento, un programa de doctorado con una perspectiva interdisciplinar. *Education in the Knowledge Society* 15, 1, 4-9.

[29] J. A. Juanes Méndez and P. Ruisoto. 2014. Technological Advances and Teaching Innovation Applied to Health Science Education. *Journal of Information Technology Research* 7, 2, 1-6. DOI:http://dx.doi.org/10.4018/jitr.2014040101.

[30] M. Á. Conde-González and Á. Hernández-García. 2015. Learning analytics for educational decision making. *Computers in Human Behavior* 47, 1-3. DOI:http://dx.doi.org/10.1016/j.chb.2014.12.034.

[31] J. A. Cordón-García and Raquel Gómez-Díaz. 2014. The Changes in the Way to Create, View and Preserve Digital Information. *Information Resources Management Journal* 27, 3, iv-v.

[32] Belén Curto and Vidal Moreno. 2016. Robotics in Education. *Journal of Intelligent and Robotic Systems* 81, 1, 3-4. DOI:http://dx.doi.org/10.1007/s10846-015-0314-z.

[33] D. Griffiths and F. J. García-Peñalvo. 2016. Informal learning recognition and management. *Computers in Human Behavior* 55A, 501-503. DOI:http://dx.doi.org/10.1016/j.chb.2015.10.019.

[34] M. Minović, F. J. García-Peñalvo, and N. A. Kearney. 2016. Gamification in engineering education. *International Journal of Engineering Education (IJEE)* 32, 1B, 308-309.

[35] F. J. García-Peñalvo and M. S. Ramírez Montoya. 2015. Educational innovation with a multicultural perspective. *Journal of Cases on Information Technology* 17, 1, iv-vi.

[36] Juan A. Juanes and Pablo Ruisoto. 2015. Computer Applications in Health Science Education. *Journal of Medical Systems* 39, 9, 97. DOI:http://dx.doi.org/10.1007/s10916-015-0283-6.

[37] F. J. García-Peñalvo. 2016. Technological Ecosystems. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje (IEEE RITA)* 11, 1, 31-32. DOI:http://dx.doi.org/10.1109/RITA.2016.2518458.

[38] M. Alier Forment, N. Caetano, F. J. Garcia-Peñalvo, B. Amante, and R. Martínez. 2015. A focus on teaching and learning sustainability and social commitment skills. *Journal of Technology and Science Education* 5, 4, 229-234. DOI:http://dx.doi.org/hhtp://dx.doi.org/10.3926/jotse.214.

[39] M. L. Sein-Echaluce, Á. Fidalgo-Blanco, and G. Alves. 2017. Technology Behaviors in Education Innovation. *Computers in Human Behavior* 72, 596-598. DOI:http://dx.doi.org/10.1016/j.chb.2016.11.049.

[40] F. J. García-Peñalvo and M. Llamas Nistal. 2017. Engineering behind technology-based educational innovations. *International Journal of Engineering Education* In Press.

[41] F. J. García-Peñalvo and M. S. Ramírez Montoya. 2016. Technology cases for improving the university Third Mission. *Journal of Cases on Information Technology* 18, 4, v-viii.

[42] F. J. García-Peñalvo. 2018. Computational thinking. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje (IEEE RITA)* 13, 1, 17-19. DOI:http://dx.doi.org/10.1109/RITA.2018.2809939.

[43] F. J. García-Peñalvo and J. A. Mendes. 2018. Exploring the computational thinking effects in pre-university education. *Computers in Human Behavior* 80, 407-411. DOI:http://dx.doi.org/10.1016/j.chb.2017.12.005.

[44] F. J. García-Peñalvo, H. Alarcón, and Á. Domínguez. 2019. Active learning experiences in Engineering Education. *International Journal of Engineering Education* 35, 1(B), 305-309.

[45] F. J. García-Peñalvo, L. Moreno López, and M. C. Sánchez-Gómez. 2018. Empirical evaluation of educational interactive systems. *Quality & Quantity* 52, 6, 2427-2434. DOI:http://dx.doi.org/10.1007/s11135-018-0808-4.

[46] C. Viegas, A. Marques, G. R. Alves, and F. J. García-Peñalvo. 2019. Engineering Education and Technological/Professional Learning. *Educational Sciences* 9, 4. DOI:http://dx.doi.org/10.3390/educsci9040277.

[47]   F. J. García-Peñalvo and M. Franco-Martín. 2019. Sensor Technologies for Caring People with Disabilities. *Sensors* 19, 22. DOI:http://dx.doi.org/10.3390/s19224914.

[48]   D. Fonseca and F. J. García-Peñalvo. 2019. Interactive and Collaborative Technological Ecosystems for Improving Academic Motivation and Engagement. *Universal Access in the Information Society* 18, 3, 423-430. DOI:http://dx.doi.org/10.1007/s10209-019-00669-8.

[49]   D. Fonseca, F. J. García-Peñalvo, and J. D. Camba. 2020. New methods and technologies for enhancing usability and accessibility of educational data. *Universal Access in the Information Society* In Press. DOI:http://dx.doi.org/10.1007/s10209-020-00776-x.

[50]   F. J. García-Peñalvo, C. Casado-Lumbreras, R. Colomo-Palacios, and A. Yadav. 2020. Smart Learning. *Applied Sciences* 10, 9. DOI:http://dx.doi.org/10.3390/app10196964.

[51]   C. S. González-González, A. García-Holgado, and A. Peixoto. 2020. Diversity and Equity in STEM. *IEEE Revista Iberoamericana de Tecnologias del Aprendizaje* 15, 3, 202-204. DOI:http://dx.doi.org/10.1109/RITA.2020.3008124.

[52]   F. J. García-Peñalvo, M. Á. Code, J. Gonçalves, and J. Lima. 2020. Advances in Computational thinking and robotics in education. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[53]   C. Viegas, A. Marques, and G. R. Alves. 2020. Engineering Education: Professional Demands. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[54]   A. García-Holgado, C. S. González-González, A. Peixoto, P. Caballero-Gil, and P. Plaza-Merino. 2020. Bridging the diversity gap: actions and experiences fostering diversity in STEM. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[55]   A. M. Pinto-Llorente, M. C. Sánchez-Gómez, and A. P. Costa. 2020. Qualitative and Mixed Methods Researches in Social Sciences. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[56]   R. Molina-Carmona, C. J. Villagrá Arnedo, F. J. Gallego-Durán, F. Llorens-Largo, I. Meca, A. Pérez Escoda, S. Serrano-Iglesias, E. Sobrino, A. Rabasa, and A. Ruiz Calleja. 2020. Research topics on Smart Learning. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[57]   Á. Fidalgo-Blanco and M. L. Sein-Echaluce. 2020. TEEM 20. Track 6: Educational Innovation. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[58]   S Marcos-Pablos, J. A. Juanes-Méndez, and M. L. Walters. 2020. State-of-the-art technologies at the service of medical training and practice to foster Digital Health Ecosystems. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[59]   N. Caetano and M. Felgueiras. 2020. Teaching Sustainable Development in higher education - changing attitudes the soft way. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[60]   C. Arcila-Calderón and D. Blanco-Herrero. 2020. New scenarios and tools for a changing world. Editorial of the Communication, Education and Social Media Track of the TEEM Conference 2020. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[61]   J. Arnedo-Moreno and C. S. González-González. 2020. 4th International Symposium on Gamification and Games for Learning (GamiLearn'20). In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[62]   Á. Hernández-García, M. Á. Conde, and J. Chaparro-Peláez. 2020. Learning Analytics: A Time to Shine. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[63]   M. J. Rodríguez-Conde, S. Olmos-Migueláñez, A. Gamazo, J. C. Sánchez-Prieto, and J. O'hara. 2020. Challenges in Evaluation in Education and Guidance: a perspective from 2020. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[64]   J. J. Mena, A. Clarke, and B. Singh. 2020. New challenges for teacher education introduced by the use of ICT in the classroom. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[65]   J. Martín Lucas, J. M. Muñoz Rodríguez, and T. Pessoa. 2020. Identity, technology and education. Identity construction processes in hyperconnected ecosystems. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[66]   D. Burgos and A. Tlili. 2020. Openness as the key factor to support education in times of crisis. In *TEEM'20 Proceedings of the Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020)*, F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[67]   D. Fonseca, M. Alier, and P. Sánchez-Holgado. 2020. Re-thinking, connecting, sharing and starting synergies. Using a collaborative AGORA session for new educational and research connections. In *TEEM'20 Proceedings of the Eighth International*

Conference on Technological Ecosystems for Enhancing Multiculturality (Salamanca, Spain, October 21st-23th, 2020), F.J. García-Peñalvo Ed. ACM, New York, NY, USA.

[68]   F. J. García-Peñalvo, M. J. Rodríguez-Conde, R. Therón, A. García-Holgado, F. Martínez-Abad, and A. Benito-Santos. 2019. Grupo GRIAL. *IE Comunicaciones. Revista Iberoamericana de Informática Educativa*, 30, 33-48.

[69]   Grupo Grial. 2019. *Producción Científica del Grupo GRIAL de 2011 a 2019*. Grupo GRIAL, Universidad de Salamanca.