Chapter 4.

Technologies and digital tools for teacher accompaniment in online and distance education programmes

Introduction

In this chapter, the concept and scope of technological educational competence are integrated into the teacher support model, with the set of technological skills that a teacher in online and distance education requires.

Some technologies and digital tools are recommended to support teacher accompaniment processes in online and distance programs. It is understood that education under these modalities should use and take advantage of digital technologies to improve the processes of accompaniment, tutoring, and teaching.

This chapter proposes technologies of open use for their integration into the educational processes, in such a way that the teaching community, in general, can integrate them without difficulty according to their needs. It is clarified that the technologies and tools are a recommendation and that the institutions must carry out the evaluation of technological solutions according to their educational projects and pedagogical models.

4.1. Technological Competence for Tutoring and Teaching Support

The tutorial accompaniment of teachers mediated by technologies and digital tools, as it has already been proposed in previous chapters, requires

a set of roles and functions of the teacher, which are consolidated in a set of pedagogical and communicative competences, which must be articulated and complemented with the technological teaching competence.

UNESCO, in partnership with several universities, has been building the conceptual framework related to technological teaching competence, defining it as the set of skills that allow the design, Implementation, and evaluation of technology for educational purposes, including software (desktop applications, mobile applications, and cloud solutions), communication networks and technologies, platforms, and technological devices: all to support processes in education (Valencia-Molina, et al., 2016). Concisely this competence includes capacity for:

- Design educational scenarios supported by the use and integration of technologies.
- Implement learning experiences supported using technologies.
- Evaluate the effectiveness of educational scenarios and learning experiences integrating technology.

Integrating this technological teaching competence to the quality management model for the accompaniment and tutoring of work. Llorente (2007) establishes that in online or distance education a tutor must have:

- Ability to design, implement and evaluate asynchronous communication spaces (forums or discussion spaces) using technology.
- Ability to design, implement and evaluate spaces of synchronous communication (video conferences, audio conferences, chats).
- Ability to understand and expose a procedure, through capturing, creating, editing, and using multimedia resources (images, sounds, or videos) and thus provide advice and tutoring to the student.
- Ability to design, implement and evaluate courses through digital Learning Management Systems (LMS).

In conclusion, an institution that develops online or distance education programs should seek that its teaching team has a set of pedagogical, communications, and technological skills that guarantee adequate accompaniment and tutoring.

Its training programs should be oriented to strengthen these competencies in a comprehensive way to guarantee that the tutorial accompaniment, the teaching, and the educational process itself fulfill their purpose.

4.2. Digital Technologies to Support Tutoring and Teaching Support

For the realization of tutoring and accompaniment using technology the teacher must be able to use at least one tool or technology within the following categories:

- **Video conference system**: Platform needed to program and carry out video conferences or video calls, with the possibility of sharing documents or work desks and allowing two-way communication. We recommend Google Meet (https://meet.google.com/) or Zoom (https://www.zoom.us/) or Jitsi Meet (https://meet.jit.si/).
- **System for recording classes or recorded masterclasses:** Tool needed to create explanatory videos of some topic. We recommend OBS Studio, easy to install and use (https://obsproject.com/es/). To create the recording and presentation we recommend Adobe Spark (https://spark.adobe.com/es-ES/).
- **Tool for drawing or creating computer graphics**. It is necessary to make infographics, drawings, and annotations. Online you can use for images Adobe Spark (https://spark.adobe.com/es-ES/) or Canva (https://www.canva.com/es_419/); for infographics Genially (https://app.genial.ly/) or Canva; and for drawings AutoDraw (https://www.autodraw.com/).
- **Image editor:** Necessary for screen capture and modification or addition of information to the image. Recommended: Lightshot or the classic Windows Paint.
- **File conversion tool:** Necessary to convert formats when you do not have the program that runs them. Recommended: Zamzar (http://www.zamzar.com/) or 123apps (https://123apps.com/es/).
- **Computer screen capture system:** Useful for recording screen movements or creating video tutorials. Recommended: aTube Catcher (https://www.atube.me/es/) or Screencast-O-Matic (https://screencast-o-matic.com/) or Screencastify (https://www.screencastify.com/).

- **System to create video tutorials:** Useful to record the user interface of any application and make an explanation to teach the use of the software through video. Recommended: aTube Catcher (https://www.atube.me/es/); Camtasia (https://www.techsmith.com/video-editor.html).
- **Video editing systems:** Necessary for editing videos, trimming, or integrating them. OpenShot (https://www.openshot.org/es/) is recommended.
- **System to generate audio (podcast):** Necessary to generate explanations in audio format. Vocaroo (http://vocaroo.com/) or SoundCloud (https://soundcloud.com/stream) or 123Apps Recorder (https://online-voice-recorder.com/es/) are recommended.
- **Online translation system:** Necessary for possible translations, among the most used is Google Translate (https://translate.google.com/?hl=es).

Conclusions

To achieve the improvement in the quality of distance and online education, it is necessary to articulate the experience of the teacher with the tutorial accompaniment to make him/her feel supported while developing his/her work and to understand that he/she is part of a process that does not focus on the possible failures but seeks to improve the competences and skills of the teaching team. To this end, the tutorial accompaniment process must be followed up, and it is key in these processes to create checklists that encourage the teacher's habits in the accompaniment and tutoring of their students regularly.

The measurement of data is a fundamental need for any process; the fact that the systematization of the results produced by the instrument has been incorporated shows that it is possible to improve thanks to a well-structured accompaniment and training process, which makes this exercise even more serious. The diagnosis of the current state of accompaniment was made, now it remains to validate the model and systematize it to implement it and apply it to the Faculty, a task that will be a new project.

The communication strategy of the model is fundamental to consolidate the relationship between the teacher and his or her companion, not only from the working point of view, since the closeness and permanent contact also generates bonds of appreciation and even friendship, strengthening the human sense that is so important in the case of FESAD.

Besides, the media and formats proposed to seek, in the first instance, to make the message effective for teachers and to generate interaction, thus obtaining the necessary feedback to identify specific needs and to develop work plans related to training and the improvement of the activities of tutorial support. To the extent that this information is systematized, follow-up reports can be generated that can be instruments of quality improvement management for

each program of the Faculty, so that the main beneficiary is the teacher and in turn their students.

The quality of the tutorial accompaniment not only requires this management model, but it must be articulated to timely, effective, and efficient administrative academic processes, such as timely registration processes, adequately planned teacher recruitment and training, and induction processes for teachers to understand their role and apply the elements proposed here effectively. And of course, a follow-up of the entire educational process that takes place in the Faculty.

Bibliographical references

Alamri, A., & Tyler-Wood, T. (2017). Factors Affecting Learners with Disabilities - Instructor Interaction in Online Learning. *Journal of Special Education Technology, 32*(2), 59-69. https://doi.org/10.1177/0162643416681497

Amador-Muñoz, L. (2004). Las tecnologías de la información y la comunicación y la formación en entornos virtuales. *Revista Complutense de Madrid, 15*(1), 51-74. https://revistas.ucm.es/index.php/RCED/article/view/RCED0404120051A/16283

American Society for Quality. (2004). *Quality Glossary.* https://asq.org/quality-resources/quality-glossary/q

Anderson, T., & Elloumi, F. (2008). *Theory and Practice of Online Learning* (vol. 2). Athabasca, Canada: Athabasca University.

Anderson, T., Rourke, L., Garrison, D., & Archer, W. (2001). Assessing Teaching Presence in a Computer Conferencing Context. *Journal of Asynchronous Learning, 5*(2), 1-17. http://dx.doi.org/10.24059/olj.v5i2.1875

Argüís, R. (2001). *La acción tutorial.* Caracas, Venezuela: Laboratorio Educativo.

Ariza, G., & Ocampo, H. (2004). El acompañamiento tutorial como estrategia de la formación personal y profesional: un estudio basado en la experiencia en una institución de educación superior. *Universitas Psychologica, 4*(1), 31-42. https://www.redalyc.org/articulo.oa?id=64740104

Baran, E., Correia, A., & Thompson, A. (2011). Transforming Online Teaching Practice: Critical Analysis of the Literature on the Roles and Competencies of Online Teachers. *Distance Education*, 421-439. https://doi.org/10.1080/01587919.2011.610293

Batlle Rois-Méndez, F. (2010). Acompañamiento docente como herramienta de construcción. *REDHECS: Revista electrónica de Humanidades, Educación y Comunicación Social, 5*(8), 102-110. https://dialnet.unirioja.es/servlet/articulo?codigo=3168023

Bawane, J., & Spector, J. (2009). Prioritization of Online Instructor Roles: Implications for Competency-Based Teacher Education Programs. *Distance Education, 30*(3), 383-397. https://doi.org/10.1080/01587910903236536

BBVA Research. (2015). *Situación economica digital.* https://www.bbvaresearch.com/wp-content/uploads/2015/07/Situacion_Economia_digital_jun15_Cap5.pdf

Berge, Z. (2008). Changing Instructor's Roles in Virtual Worlds. *Quarterly Review of Distance Education, 9*(4), 407-414.

Borges, F. (2005). La frustración del estudiante en línea. Causas y acciones preventivas. *Digithum, 7*(7), 1-8. http://www.uoc.edu/digithum/7/dt/esp/borges.pdf

Cabero, J. (2006). Bases pedagógicas del e-learning. *Revista de Universidad y Sociedad del Conocimiento, (RUSC), 3*(1), 1-10.

Cebrián-de-la-Serna, M. (2004). Impacto de las tecnologías de la información y comunicación en la Universidad. *Revista Bordón*, *56*(3-4), 587-600.

Chang, C., Shen, H., & Liu, Z. (2014). University Faculty Perspectives on the Roles of E-Instructors and Their Online Instruction Practice. *The International Review of Research in Open and Distributed Learning, 15*(1), 72-92. https://doi.org/10.19173/irrodl.v15i3.1654>

Chiape, A. (2002). *Porque el tigre no es como lo pintan. La virtualidad como estrategia de modernización educativa.* Manizales, Colombia: SIC Editorial.

Centro de Investigación y Desarrollo en Tecnologías de la Información y las Comunicaciones. (2007). *Panorama de las telecomunicaciones.* http://cintel.co/wp-content/uploads/2013/05/12.estudio_sectorial_2007_PANORAMA-DE-LAS-TELECOMUNICACIONES-2007.pdf

Centro de Investigación y Desarrollo en Tecnologías de la Información y las Comunicaciones. (2015). Uso de Internet en Colombia. *Revista RCT*, 1-6. http://issuu.com/revistarct/docs/articulo2

CISCO. (2010). *The Learning Society.* http://www.cisco.com/c/dam/en_us/about/citizenship/socio-economic/docs/LearningSociety_WhitePaper.pdf

Coppola, N., Hiltz, S., & Rotter, N. (2002). Becoming a Virtual Professor: Pedagogical Roles and Asynchronous Learning Networks. *Journal of Management Information Systems, 18*(4), 169-189. https://doi.org/10.1080/07421222.2002.11045703

Córdoba, L. (1998). *Documento sobre proyecto de tutorías.* Bogotá, Colombia: Universidad Católica de Colombia.

Comisión de Regulación de Comunicaciones. (2010). *Análisis del sector TIC en Colombia: evolución y desafíos. Documento de Análisis Regulación de Infraestructura y Centro de Conocimiento de la Industria.* https://www.crcom.gov.co/recursos_user/Documentos_CRC_2011/Actividades%20_Regulatorias/AgendaRegulatoria/2011/DocumentoAnalisisIndustria.pdf

Docebo. (2014). *E-Learning Market Trends & Forecast 2014 - 2016 Report.* https://www.iconcept.nl/publicfiles/136/bestanden/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf

Downes, S. (2012). *Conectivism and Conective Knowledge. Essays of Meaning and Learning Networks.* https://www.oerknowledgecloud.org/archive/Connective_Knowledge-19May2012.pdf

Facundo, A., Silvio, J., Rivera, K., Rama, C., Padilla, A., Torres, J., & Ortiz, A. (2004). *La educación superior virtual en america latina y el caribe* (Vol. 1). (ANUIES, Ed.) Mexico D.F., Mexico: ANUIES.García-Aretio, L., Ruiz-Corbella, M., Domínguez-Figaredo, D. (2007). *De la educación a distancia a la educación virtual.* Barcelona, Ariel.

García-Aretio, L. (2001). *La educación a distancia. De la teoría a la práctica.* Barcelona: Ariel.

González, C. R. (2008). Herramientas básicas para el acompañamiento tutorial. *Revista Mexicana de Orientación Educativa, 6*(14), 12-18.

González-Sanmamed, M., Muñoz-Carril, P. C., & Sangrà, A. (2014). Level of Proficiency and Professional Development Needs in Peripheral Online Teaching Roles. *The International Review of Research in Open and Distributed Learning, 15*(6), 162-187. https://core.ac.uk/download/pdf/33186293.pdf

Goodyear, P., Salmon, G., Spector, J., Steeples, C., & Tickner, S. (2001). Competences for Online Teaching: A Special Report. *Educational Technology Research and Development, 49*(1), 65-72. https://www.jstor.org/stable/30220300

Goold, A., Coldwell, J., & Craig, A. (2010). An Examination of the Role of the E-Tutor. *AJET - Australasian Journal of Educational Technology, 26*(5), 704-716. https://doi.org/10.14742/ajet.1060

Guasch, T., Álvarez, I., & Espasa, A. (2010). University Teacher Competencies in a Virtual Teaching/Learning Environment: Analysis of a Teacher Training Experience. *Teaching and Teacher Education, 26*(2), 199-206. https://doi.org/10.1016/j.tate.2009.02.018

Guitert, M., & Romeu, T. (2019). *Estrategias para la docencia en línea.* Barcelona, España: Universidad Oberta de Cataluña.

Project Management Institute. (2014). *Guía de los fundamentos para la dirección de proyectos (Guía del PMBOK®)* (5ª. ed.). Pennsylvania, EE. UU.: Project Management Institute.

ISO 9000:2005. (2005). *Sistemas de gestión de la calidad. Fundamentos y vocabulario.* https://www.iso.org/obp/ui/#iso:std:iso:9000:ed-4:v1:es

Koory, M. (2003). Differences in Learning Outcomes for the Online and F2F Version of "An Introduction to Shakespeare". *Journal Asynchronous Learning Networker, 7*(2), 18-30. http://dx.doi.org/10.24059/olj.v7i2.1851

Larsen, A., Sanders, R., Astray, A., & Hole, G. (2008). E-teacher Challenges and Competences in International Comparative Social Work Courses. *Social Work Education Journal, 27*(6), 623-633. https://doi.org/10.1080/02615470802201671

Lasso, E., Munévar, P., & Rivera, A. (2011). *La acción tutorial en la educación virtual.* https://recursos.educoas.org/sites/default/files/VE14.267.pdf

Llorente, M. C. (2006). El tutor en e-learning: aspectos a tener en cuenta. *Revista Electrónica de Tecnología Educativa Edutec,* 20. https://www.edutec.es/revista/index.php/edutec-e/article/download/517/250/

Llorente, M. C. (2007). La tutoría virtual. Técnicas, herramientas y estrategias. *Eduweb: Revista de Tecnología de Información y Comunicación en Educación, 1*(1). http://servicio.bc.uc.edu.ve/educacion/eduweb/vol1n1/art1-2.pdf

Marín, V., Reche, E., y Maldonado, G. (2013). Ventajas e inconvenientes de la formación *online*. *Revista Digital de Investigación en Docencia Universitaria, 7(*1), 33-43.

Medina, Y. C., & Rico, D. W., & Rico, N. A. (2011). Calidad en la función tutorial para la gestión en entornos virtuales. *Revista Educación en Ingeniería, 6*(12), 23-36. https://doi.org/10.26507/rei.v6n12.127

Mesa-Agudelo, N., Cuervo-Estrada, L., & Arbeláez-Echeverri, N. (2013). *El instrumento de acompañamiento como estrategia que permite fortalecer las competencias técnicas, pedagógicas-didácticas y comunicativas en el docente e-learning*. https://reposital.cuaed.unam.mx:8443/xmlui/handle/20.500.12579/3754

Meza, J. (2012). *Modelo pedagógico para proyectos de formación virtual*. http://www.facico-uaemex.mx/diplomado/2.3%20BB%20MEZA%20JOHANA.pdf

Online Business School. (2014). *El mercado global del e-learning*. http://www.ibercampus.es/imagenes%5Cfotosdeldia%5C4772_el_mercado_global_de_e_learning_2014.pdf

Pagano, C. M. (2007). Los tutores en la educación a distancia. Un aporte teórico. *Revista de Universidad y Sociedad del Conocimiento (RUSC), 4*(2), 1-11.

Pino-Juste, M. (2008). Aplicaciones de herramientas de e-learning a la docencia presencial. *Revista de Formación e Innovación Educativa Universitaria, 1*(4), 87-95.

Poveda, D., & Rodríguez, A. (2014). Modelos e-learning para integrar las TIC y transformar programas de educación a distancia en programas virtuales. *Revista de Investigaciones UNAD, 13*(1), 59-75. https://doi.org/10.22490/25391887.1131

Pryor, C. R., & Bitter, G. G. (2008). Using Multimedia to Teach Inservice Teachers: Impacts on Learning, Application, and Retention. *Computers in Human Behavior, 24*(6), 2.668-2.681.

Revuelta-Domínguez, F. I., & Pérez-Sánchez, L. (2011). *Interactividad de los entornos en la formación* on-line (2.ª ed., vol. 1). Barcelona: Universidad Oberta de Cataluña.

Rodríguez-Hernández, A. (2016). International Perspective on Policies and Quality Standards for E-Learning. *Suplementos Signos EAD,*

5(12), 1-13. https://p3.usal.edu.ar/index.php/supsignosead/article/view/3701/4590

Ryan, J., Scott, A., & Walsh, M. (2010). Pedagogy in the Multimodal Classroom: An Analysis of the Challenges and Opportunities for Teachers. *Teachers and Teaching Journal, 16*(4), 477-489. https://doi.org/10.1080/13540601003754871

Salmon, G. (2003). *E-moderating. The Key to Teaching and Learning Online* (2ª. ed.). Londres: Taylor & Francis.

Siemens, G. (2005). Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning (ITDL), 2*(1), 1-8.

Sobrino-Morrás, Á. (2011). The Teaching-Learning Process and Web 2.0: Assessment of Connectivism as a Post-Constructivist Learning Theory. *Estudios sobre educación, 20*(20), 117-139.

Universidad de Caldas. (2015). *Aspectos tecnológicos y pedagógicos en la formación e-learning. Documento de apoyo para la implementación de aulas virtuales.* http://docplayer.es/5599064-Aspectos-tecnologicos-y-pedagogicos-en-la-formacion-e-learning-documento-de-apoyo-para-la-implementacion-de-aulas-virtuales.html

Universidad Pedagógica y Tecnológica de Colombia. (2015a). *Informe de deserción 2015.* Tunja, Colombia: Vicerrectoria Académica.

Universidad Pedagógica y Tecnológica de Colombia. (2015b). *Informe diagnóstico Plan de Desarrollo 2011-2015.* Tunja, Colombia: Oportunidad Estratégica.

Valencia-Molina, T., Serna-Collazos, A., Ochoa-Angrino, S., Caicedo-Tamayo, A., Montes-González, J., & Chávez-Vescance, J. (2016). *Competencias y estándares TIC desde la dimensión pedagógica: Una perspectiva desde los niveles de apropiación de las TIC en la práctica educativa docente* (vol. 1). Cali: Pontificia Universidad Javeriana - UNESCO.

http://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/Santiago/pdf/Competencias-estandares-TIC.pdf

Varvel, V. (2007). Master Online Teacher Competencies. *Online Journal of Distance Learning Administration, 10*(1). https://www.westga.edu/~distance/ojdla/spring101/varvel101.htm

Velásquez, C. (2012). *Criterios e indicadores para evaluar la calidad de la educación en instituciones de educación superior.* Caracas, Venezuela: Universidad Central de Caracas.

Williams, P. (2003). Roles and Competencies for Distance Education Programs in Higher Education Institutions. *American Journal of Distance Education, 17*(1), 45-57. https://doi.org/10.1207/S15389286AJDE1701_4

Sobre los Autores

Ariel Adolfo Rodríguez Hernández

ORCID ID: https://orcid.org/0000-0003-1906-7734
Email: ariel.rodriguez@uptc.edu.co

Profesor asociado Universidad Pedagógica y Tecnología de Colombia. Líder e investigador de los grupos de investigación TICA y Tecno-Innovaciones de la Facultad de Estudios a Distancia e investigador del Grupo TelemaTICs de la Facultad de Ingeniería. Investigador en la linea de tecnologías digitales y Sistemas de Información y TIC. Consultor en e-learning y en transformación digital. Ingeniero de Sistemas Magíster en Software Libre – Phd (c) en Tecnología Educativa.

Josué Nicolás Pinzón Villamil

ORCID ID: https://orcid.org/0000-0003-1968-5372
Email: josue.pinzon@uptc.edu.co

Profesor de la Universidad Pedagógica y Tecnológica de Colombia del área de sistemas y educación e investigador de los grupos de investigación TICA y Tecno-Innovaciones de la Facultad de Estudios a Distancia, e investigador del Grupo TelemaTICs de la Facultad de Ingeniería. Experto en integraciones tecnológicas de alto impacto, ha participado en transformaciones digitales de empresas en el sector público y privado. Apasionado por el emprendimiento y la innovación tecnológica. Ingeniero de Sistemas y Computación - Magíster en Arquitectura del Software.

Fanny Avella Forero

ORCID ID: https://orcid.org/0000-0003-0430-1225
Email: Fanny.avella@uptc.edu.co

Profesora de la Universidad Pedagógica y Tecnológica de Colombia en el área administrativa e investigadora del Grupo de investigación TICA de la Facultad de Estudios a Distancia. Experiencia investigativa en TIC aplicadas a la educación. Experiencia en coordinación de centros, proyectos y capacitación en emprendimiento, así como en la gerencia de empresas y coordinación de procesos administrativos, de mercadeo, logísticos en el sector público como privado. Administradora de Empresas - Especialista en Gerencia Estratégica de Mercadeo - Magíster en Administración de Negocios.

Claudia Patricia Moreno Cely

ORCID ID: https://orcid.org/0000-0002-7584-1897
Email: claudia.moreno@uptc.edu.co

Profesora de la Universidad Pedagógica y Tecnológica de Colombia en el área de educación; investigadora de los grupos de investigación TICA y SIEK de la Facultad de Estudios a Distancia y GEKOS de la Facultad de Ciencias de la Educación de la UPTC. Ponente en congresos nacionales e internacionales, asesora del programa de Escuelas Normales Superiores, Experiencia investigativa en educación integrando las TIC. Docente, directora y asesora de proyectos de grado de pregrado y posgrado en el área de la educación. Licenciada en Educación, Ciencias Sociales y Económicas - Magíster en Educación.

Mauricio Enrique Camacho

ORCID ID: https://orcid.org/0000-0002-7354-504X
Email: mauricio.camachocamacho@fh-dortmund.de

Administrador de aprendizaje e investigador del HAW InduTwin del IDIAL y la Facultad de Informática del Fachhochschule Dortmund de University of Applied Sciences and Arts. Profesor y coordinador académico en diferentes instituciones educativas, y ponente en eventos internacionales. Ingeniero de Sistemas - Especialista en Auditoría de Sistemas - Magíster en Gestión de Proyectos de TI) becado por COLFUTURO, DAAD (Servicio Alemán de Intercambio Académico) y Deutschlandstipendium - Magíster (c) en Gestión de la Tecnología Educativa.

María Consuelo Rodríguez Niño

ORCID ID: https://orcid.org/0000-0002-4572-3187
Email: mariac.rodriguez@unad.edu.co

Profesora en la Universidad Nacional Abierta y a Distancia en las áreas de la ingeniería de sistemas e investigadora del Grupo de Byte in Design en las áreas de sistemas adaptativos, cómputo afectivo y agricultura de precisión. Ingeniera de Sistemas - Especialista en construcción de software para redes - Magíster en e-Learning. Estudiante del Doctorado en Ingeniería.