

Innovating university teaching with micro-credentials: an ongoing research experimentation

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Abstract

The experience of the Covid-19 lockdown has suddenly accelerated the awareness process of the entire university faculty about the need to hybridise their teaching with digital tools (Trentin, Bocconi 2015; Perla, Scarinci, Amati 2021) transforming traditional scholarship of the Italian University in a gigantic field of experimentation of innovative practices (Perla, 2020, p. 562). This has brought out the importance of supporting the quality of university teaching through the commitment to address precise Faculty Development policies, specifically through the development of innovative experiences and the design of paths based on micro-credentials. This contribution reports some actions promoted by the University of Bari aimed at the innovation of university teaching and the results of a pilot course on micro-credentials.

Keywords: higher education course, certification, teaching qualification, university

Introduction

In recent decades, in Italy as well, there has been a need to support the quality of university teaching by means of a commitment to specific Faculty Development policies (Sorcinelli, 2007; Steinert, 2010, 2014; O'Sullivan, Irby, 2011; Beach et al., 2016; Felisatti, Serbati, 2017; Lotti, Lampugnani, 2020; Perla, Vinci *in press*) and the structuring of academic curricula geared towards the development of students' soft skills, which are weak and not at all effective in the process of leaving the university environment and entering the world of work (Yunus, Li, 2005; Bridgstock, 2009): these are critical thinking, problem solving, decision making, responsibility taking and management skills for complex activities or projects, defined as 'just-in-time', i.e. immediately applicable in multiple work contexts (EC, 2020).

The experience of the lockdown from Covid-19 unexpectedly accelerated the process of making the entire university teaching staff aware of the need to hybridise their teaching with digital tools (Trentin, Bocconi, 2015; Perla, Scarinci, Amati, 2021) transforming the traditional scholarship of the Italian university into a large field for experimenting with innovative practices (Perla, 2020, p. 562). The Italian higher education system, while appearing for many years reluctant and unable to develop effective policies for change through systemic approaches to professional development integrated into career development, has recently been developing some innovative experiences in this direction.

These include the design of pathways based on micro-credentials, defined as proof of the learning outcomes acquired by the learner and assessed against transparent and shared standards, documented by means of a certificate listing the learner's name, the learning outcomes achieved, the method of assessment, the certifying entity and, where applicable, the level of the qualifications framework and the accreditation obtained (Berry, Airhart, Byrd, 2016).

1. Micro-credentials: definition, characteristics and innovative features

A micro-credential is defined as 'a proof of the learning outcomes that a student has acquired following a short learning experience. These learning outcomes were assessed against transparent standards. The evidence is contained in a certified

document that lists the name of the holder, the learning outcomes achieved, the assessment method, the issuing body and, where applicable, the level of the qualifications framework and the credits acquired. Micro-credentials are student-owned, can be shared, are portable, and can be combined into larger credentials or qualifications. They are supported by quality assurance according to agreed standards' (EC, 2020, p. 10).

These are therefore credentials issued by an institution, such as the university, which qualify the skills and competences acquired by the subject through flexible and modular micro-activities/micro courses, which offer the possibility of recognising formal and informal learning and being able to achieve professional development. As the EC (2020, p. 7) points out, the modularity of these courses allows educators to 'build a portfolio of skills' by giving them the opportunity to 'reach a professional learning potential', expanding and improving knowledge. While this aspect would facilitate the portability of acquired skills and practices, on the other hand it highlights the difficulty of their transferability and their recognition from one country to another, an aspect on which the EC is working for a definition of common goals and standards of micro-credentials.

The characteristics that distinguish micro-credentials from traditional professional development systems and make them effective in updating and retraining skills and knowledge are (Berry, Airhart, Byrd, 2016; Crow, 2017):

- *The competence-based approach* involves the identification and recognition of skills and competences that can be acquired in different learning environments by demonstrating mastery of the subject and performance.
- *Personalisation*: Micro-credentials offer students and professionals the opportunity to choose and create their own learning path that best meets their needs and objectives and enrich their skills portfolio.
- *On demand*: Micro-credentials meet the needs of students as they allow them to follow at their own pace and in their own ways, choosing to explore new skills or even requesting recognition at any time of the day.
- *Shareable*: Micro-credentials can be shared on online platforms, which is why they can be considered as a sort of 'portable currency for professional learning that educators can take with them wherever they go' (Berry, Airhart, Byrd, 2016).

These aspects make the micro-credentials tools capable of offering personalised learning opportunities for everyone with a view to lifelong learning and guaranteeing skills (and not contained as in traditional qualifications) that can be immediately used in a work context, in constant change (EC, 2020). This not only facilitates a retraining of adult workers of their skills and a recognition of learnings learned in informal contexts but also provides an opportunity for university students and doctoral students to broaden their curriculum (EC, 2020).

In addition to offering customisable and flexible paths, micro-credentials are also inclusive since they guarantee access and quality of education even to disadvantaged groups. This in addition to 'strengthening the role of higher education and vocational education and training (VET) institutions in promoting lifelong learning by providing more flexible and modular learning opportunities', by innovating lifelong learning, makes it possible to respond to 'their mission social' (EC, 2020, pp. 6–7).

The growing demand for credentials and the vast offer of courses from multiple suppliers highlight the problem of a univocal approach on the part of different countries and institutions in order to guarantee the recognition and portability of micro-credentials across borders and make them more functional for global job market. This pre-supposes a definition of standards and transparency in certification, aspects on which the EC is working. At present, reference is made to already 'existing instruments of transparency and quality assurance of the EU and the European Higher Education Area (EEA)' (EC, 2020, p. 8), which allow to issue micro-credentials based on an assessment of learning outcomes.

2. Experiences of innovation for university didactics in the UNIBA TLC

Following the challenges of renewal of the higher education system, the University of Bari has started, since 2016, an experimentation protocol in some steps:

- a. Participation in the PRODID project – Preparation for Teacher Professionalism and Teaching Innovation, born on the initiative of E. Felisatti at the University of Padua (Felisatti, & Serbati, 2015) and subsequently implemented by the network of Italian Universities (Bari, Camerino, Catania, Florence, Foggia, Genoa, Turin) constituting the Italian Association for the Promotion and Development of Teaching, Learning and Teaching in Universities (ASDUNI; see <https://asduni.it>).
- b. Design and implementation of the first Teaching and Learning Laboratory (TLL) officially established in a university in Apulian Region (September 2017) with the establishment of a Working Group dedicated to Faculty Development Programs: TLL is a multi-disciplinary research laboratory that has various functions, including organising and implementing pedagogical courses aimed at different target groups (researchers, administrative staff and doctoral students), developing research on faculty development and accompanying the university's educational and technological innovation, evaluating teachers' skills and the impact of training programmes on the quality of the university as a whole.
- c. Structuring of pilot training paths – customised according to different target groups – for the professional development of newly hired and in-service university teachers, in order to improve teaching, raise the quality of learning, support innovation (Perla, Vinci, 2018a, 2018b, 2021).
- d. Initiation of forms of co-analysis and co-design with teachers belonging to different disciplinary areas, in order to build – through a collaborative approach (Perla, 2011) – a dialectical dialogue between didactics and disciplinary knowledge

at university level: it is a very useful co-epistemological work of research (Perla, Brusa, Vinci, 2018), of a reflection on one's own practice (and on the effectiveness of the mediators used, which may be of an active, iconical, analogical or symbolic nature) and of formalisation, which allows university teachers to deeply and reflectively rethink their way of transposing the contents of scientific knowledge into learned knowledge (Shulman, 1987; Damiano, 2013; Perla, Agrati, Vinci, 2019).

The Teaching and Learning Center of the University of Bari also includes interdisciplinary teams consisting of teachers from various epistemological backgrounds (e.g. general didactics and disciplinary didactics) who can collaborate in some university planning and evaluation actions (e.g. drafting of the teaching syllabus, peer learning practices, etc.): training models have also been designed and implemented on the basis of this constant epistemological exchange and dialogue. As is well known, in fact, exclusively seminar-based training is not effective in the university context: disciplinary knowledge in the university context relates to different areas and is of a specialised nature, often difficult to transpose so that students can understand the educational value of knowledge and acquire useful knowledge and skills that can be used outside the university context. The educational objectives of Italian degree and master's degree courses are not always set according to uniform criteria. The consequences of this critical situation can be seen in a series of problems concerning student learning, both incoming and outgoing, such as the problem of dropouts or the limited success of students at university level; the growing difficulty for students to take advantage of traditional academic lectures; the need to create forms of transition and educational continuity from secondary school to university. Training university students calls for profound changes on the part of the university teacher in the way he or she selects the knowledge content to be taught (and to make it 'potable') and in the mediators, including technological mediators, which are indispensable for transforming that content into long-term educational and transdisciplinary skills, bringing together didactics and new multimedia formats for the dissemination of science, which are highly effective in terms of communication, and questioning the relationship between the ends and means of teaching (curriculum, planning, assessment, etc.).

The curriculum design is grounded in adult learning theories and values, in particular, certain methods for professional learning, such as what Orland-Barak and Maskit (2017) have called 'artefacts'. They are classified into three macro-categories, related to the function for which they are used: communicative (e.g. narratives, visuals, stories, movies, role plays, lesson studies and research-action); supporting the development of new practices (e.g. storytelling, video-recording, practice analysis, experience observation or documentation and media communication devices); supporting the dynamics of interaction, relationship and negotiation. The underpinning model – already pioneered by the Lund University (Sweden) and based on the Learning Cycle model (Kolb, 1984) – is based on a spiral process in which three inter-related elements interact to develop the pedagogical expertise in teaching (Tågerud 2010): theoretical knowledge of teaching-learning processes; educational practices of interaction with students; design and observation teaching skills.

2.1 The pilot course on micro-credentials

The last step, which is under way, consists of testing micro-credentials through a pilot service-learning course on students' transversal skills. This is a course aimed at students on pedagogy courses, structured in workshop modules (for a total of 4 CFU) and conducted (from October 2021) by university lecturers in collaboration with external experts from the area.

The European Association of Digital Teaching Universities (EADTU) and the European MOOC Consortium (EMC) have developed the Common Microcredentials Framework (CMF) to facilitate and harmonise the recognition of the qualifications offered in higher education institutions. It requires courses to be structured in accordance with the following criteria: they take a total workload of 100–150 hours (4–6 ECTS); they are graded at Level 6 (bachelor) to 7 (Master) of the European Higher Education Area or National Quality framework levels; they provide an assessment that allows for the award of academic credit; they provide a reliable system of identity verification at the point of assessment; include a transcript indicating, for a course, the learning outcomes, the hours of study needed, the European Qualifications Framework (EQF) level and the number of credit points achieved. According to Antonaci et al. (2021) and the Microbol project (Chakroun, Keevy 2018; Cirlan, Loukkola, 2020), the format of micro-credentials program should be designed to: enabling flexible, accessible and scale-up education opportunities providing shorter, compact online programmes with no compromise on the quality provided; certifying short learning experience – specific knowledge, skills or competences – responding to social, personal, cultural or employability needs; making an explicit reference to: the European Higher Education Area or National Quality framework levels; the learning outcomes, which will be attained; a work load expressed in European Credit Transfer; the assessment methods and criteria employed.

Micro-credential design includes educational quality principles such as: constructive alignment of learning outcomes; providing authentic and scaffolded learning activities; planning for students engagement and interactivity; embedding relevant, current and reliable content; learning support; proper choice of educational technology; usability and adaptation to standards and guidelines on disability; shorter, modular and overlapping modules; personalisation of the experience through individual learning sequences based on students' pre-existing knowledge or skills, diagnoses or formative assessments (Rossiter, Tynan 2019).

Table 1. The learner-and-earner micro-credential journey
(adapted from: Rossiter & Tynan, 2019, p. 8)

Phases and transitions of the learner-and-earner journey	Steps
Be aware and understand	Hear, Browse (discovery, information gathering and understanding)
Choose	Consider, Decide
Commit	Enrol (understanding of their commitment)
Pre-commence	Prepare, Motivation, Engage
Commence and focus	Learn, Belong
Complete	Quality, Assess
Celebrate	Claim badge
Use, share and connect	Publish, Share, Enrol

In accordance with the report ‘Making micro-credentials work for learners, employers and providers’ (2019), the structure and organisation of micro-credentials meet the needs of offering qualification levels and promoting lifelong learning activities for the main stakeholders (such as students, Employers, Providers...) of the formal higher education system providing them with the skills and cognitive abilities necessary to cope with the rapid transformations of work contexts, especially following the digitisation process. In fact, the continuous updating of skills cannot be guaranteed only by degree courses and/or masters, which despite ensuring a high quality of training, involve disadvantages such as the not short time required to obtain qualifications; failure to complete a degree, which is considered a credit towards the university; the lack of clarity, in some cases, of the learning outcomes obtained at the end of the study path as well as of the evaluation that leads to their recognition; the qualification obtained, which presents itself as ‘unit titles rather than achievements or skills’ (Oliver, 2019: 8). The design and use of micro-credentials allow you to go beyond these limits of formal higher education and be able to recognise and certify new skills and those acquired from experience.

In relation to these aspects, the University of Bari has promoted free choice activities included in the training courses aimed at the acquisition of transversal skills useful for achieving better opportunities for entering the job market. These activities are not only open to all students enrolled in the three-year, master’s or single-cycle degree courses of the University of Bari, but also to external subjects in possession of a secondary school diploma, and whose attendance involves the acquisition of CFUs. The micro-courses fit into six thematic areas:

- Communication skills
- Technical-scientific skills
- Soft skills
- Digital skills
- Project management, entrepreneurship, employability
- Sustainability, enhancement of differences, Service Learning

The course examined in this exploratory research is ‘Service Learning for responsible citizenship: social projects in the era of Covid-19’. The proposed activity in laboratory form is divided into four modules of 1 CFU each and with specific learning objectives:

1. Designing for the social and for schools: the module is aimed at the development of ‘project ideas for the social’ and provides an initial nucleus of ‘testimonials’ brought by professionals and entrepreneurs who have particularly distinguished themselves in the business sector of social service.
2. Learning to unlearn for diversity and inclusion: the module is aimed at activating deconstructive ‘dis-learning’ situations on specific topics relating to diversity and inclusion and promotes examination, analysis and the discovery of preconceptions about diversity providing elements for maturing a new outlook.
3. Partners in learning: the module is aimed at explaining the construct of educational personalisation through projects to support children who struggle at school and/or families and/or the elderly.
4. The ‘Human service oriented’ approach for responsible citizenship: the module is aimed at the conception and implementation of an educational plan to be put at the service of the academic or territorial community in the following areas: character education, knowing how to evaluate the effects of one’s own actions, listening and peaceful conflict resolution, empathic behaviour, ethical consumption, cultural heritage of one’s country, digital citizenship, digital identity, technologies and digital environments for civic participation.

Table 1. Course curriculum: transversal competences and specific contents

Expected competences of the workshop activities	Modules	CFUs (University credits)
Designing for social and schools	Fundamentals of Project Management for Service Learning	1 CFU
	Project Planning for Service Learning	2 lessons 1 workshop 9 personal study
Learning to unlearn for diversity and inclusion	Board games and educational inclusion for Service Learning	1 CFU
	Gamification	2 lessons 2 workshop 9 personal study
Partners in learning: because peers are better learners	Donor personas (personalisation techniques) for Service Learning	1 CFU
	Learning Analytics for Beginners	2 lessons 1 workshop 9 personal study
'Human service oriented' approach: for responsible citizenship	Rewards crowdfunding ed equity crowdfunding: how to organise bottom-up microfinance (part I and II)	1 CFU
	How to make a video for Service Learning Before filming During the shoot Make yourself known	2 lessons 2 workshop 9 personal study

This micro-credential pilot course allows for specific skills and competences acquisition, such as:

- Planning (of objectives, to address inequity and exclusion, for students 'Jobs to be done')
- Community improvement through Team Building
- Collaboration through Teaming
- Solving authentic real-world problems
- Critical thinking skill
- Personalising learning

These skills are integrated with the skills and competences acquired in the various degree courses and which can be spent in work contexts that deal with the design of educational paths and the promotion of social services, but which are also transversal to other contexts.

The evaluation was based on the production of project work on the topics covered.

The pilot course participants were given the opportunity to cooperate in a virtual community, exchanging resources and feedback on the micro-credentialing process.

The advantages of a course designed according to micro-credentials are, for students, that of being certified in transversal competences – such as creativity, problem solving, entrepreneurship, communication, ability to work in a team, critical thinking skills – which are indispensable in the transition from the academic to the professional context; for universities, that of experimenting with innovative ways of delivering instruction, also making use of external experts working in professional contexts.

The department will be looking to these participants as a design team who can advise on the content, process and supporting structures needed to implement micro-credentials with all beginning teachers.

2.2 Pilot course evaluation survey

A questionnaire was administered at the end of the pilot course to highlight:

- the transversal skills acquired
- the level of satisfaction with the course, its contents and the teaching methods used;
- suggestions, criticisms or proposals;
- perceived usefulness of the course for the professional future.

This is an exploratory study, which explores the experience and potential of a micro-credential-based design approach from the perspective of students.

The questionnaire, consisting of 14 closed-ended and 2 open-ended questions, was administered online via Google Forms. The questionnaire was answered by 21 students, whose characteristics are summarised in the following table:

Table 2. Sample characteristics

Genre	Degree course	Course year
1 man	Five-year degree for teachers (15)	3rd year (4)
20 women	Bachelor's degree for educators (5)	5th year (12)
	Master's degree in Pedagogy (1)	Supplementary year (5)

Only some selected data are described. For more than 70% of the respondents, the contents addressed were only partly known but needed to be deepened; for 24%, they were unknown (only 5% already knew the contents proposed).

With regard to the transversal competences acquired, the learners rated them on a scale of 1 to 4 (1 = much improved; 2 = fairly improved; 3 = little improved; 4 = not improved at all). The answers show that the pilot course had a more significant impact on the 'use of appropriate strategies in dealing with the task' (Mean: 1.4), on 'critical thinking' (1.5), on "creativity" (1.5) and on the capacity for 'problem solving and decision making' (1.5); the impact on the 'ability to collaborate in a group', on 'professionalism' and on 'communication' was lower.

Table 3. Transversal competences

After attending the course, do you consider your transversal competence related to:	Mean	Mode	St. Dev.
Ability to collaborate in a group	1.8	2	0.8
Ability to relate	1.7	1	0.8
Critical thinking	1.5	1	0.7
Creativity	1.5	1	0.7
Professionalism	1.8	2	0.8
Empathy	1.6	1	0.7
Problem solving and decision making	1.5	1	0.7
Entrepreneurship	1.6	1	0.8
Use of appropriate coping strategies	1.4	1	0.7
Resilience	1.6	1	0.8
Comunicazione	1.7	2	0.8

Among the preferred modules/contents, the most cited are 'Board games and educational inclusion for service learning' (66.7%) and 'Gamification' (61.9%), followed by 'Project Planning for Service learning' (38.1%) and 'User Centred Design (personalisation techniques)' (14.3%). The least appreciated ones are 'Fundamentals of Project Management for Service learning' (4.8%), 'How to make a video for Service learning' (4.8%), followed by 'Learning Analytics for beginners' (9.5%) and 'Rewards crowdfunding and equity crowdfunding' (9.5%).

The answers concerning the perceived usefulness of the course for the professional future are all largely positive (Mode: 1) and the highest value concerns the usefulness 'for the increase of professional skills' (Mean: 1.3).

Table 4. Perceived usefulness of the course

Did you find the course as a whole? (1= very; 2= enough; 3= little; 4= not at all)	Mean	Mode	St. Dev.
Useful in general	1.5	1	0.7
Satisfactory overall	1.5	1	0.7
Useful for entering the world of work	1.4	1	0.7
Useful for professional updating	1.4	1	0.6
Useful for increasing professional skills	1.3	1	0.6

As many as 95.2% of the respondents believe that this type of training is necessary for the future profession and should therefore be repeated in the coming years; 90.5% believe that a second level should be envisaged for this pilot course. The level of satisfaction is very high.

Conclusions

Micro-credentialing is in its nascent stages at the University of Bari, and many issues still need to be addressed.

Key challenges involve funding and sustainability, effective communicating with policy makers and teachers, and the organisation of people and resources to effectively support local districts in this endeavour.

University of Bari leaders expect that in years ahead, the micro-credentialing model will expand to support much needed reforms at state level, including creating pathways to innovate leadership for teacher, identifying expert evaluators and coaches, cultivating leaders for online communities of practice on a variety of learning topics. As it happens in many countries around the world, the effort is to modelling in the University of Bari training courses that are procedurally certified through micro-credit, therefore personalised, focused on skills traditionally excluded from the formal curricula of university courses and ‘exportable’ – i.e. recognised also outside an academic pathway – designed and implemented in an interdisciplinary way and as a result of the comparison between researchers and experts operating in the territory.

Some initial considerations can be inferred from the pilot course.

On the one hand, the training design currently being experimented is revealing the need to invest in the professional development of university teaching through innovative approaches that increasingly link the university with the local area, the labour market and the new communication technologies; on the other hand, the importance of investigating the dialectical relationship between the documentation of the results achieved and the recognition and certification of the skills acquired by the students, through a system that allows reference to be made to standards, that has ‘exportable’ outputs (flexibly and in a customised manner linked more to the student’s pathway than to the academic curriculum) and that allows the impact of training to be assessed more concretely.

Micro-credentials can support university system leaders to advance teaching and learning in empowering ways by developing more innovative strategies to documenting, strengthening and maximising teachers’ competencies.

References

- Antonaci, A., Henderikx, P., Ubachs, G. (2021). The European Common Micro-credentials Framework for MOOCs and Short Learning Programmes, *Journal of Innovation in Polytechnic Education*, 3(1), 5-9.
- Beach, A.L., Sorcinelli, D.M., Austin, A.E., & Rivard, J.K. (2016). *Faculty Development in the Age of Evidence: Current Practices, Future Imperatives*. Sterlin (VA): Stylus Pub Llc.
- Berry, B., Airhart, K.M., Byrd, P.A. (2016). Micro-credentials: Teacher learning transformed. *Phi Delta Kappan*, 98(3), 34-40.
- Bridgstock, R. (2009). The graduate attributes we’ve overlooked Enhancing graduate employability through career management skills. *Higher Education Research and Development*, 28, 31-44.
- Chakroun, B., & Keevy, J. (2018). *Digital Credentialing. Implication for the recognition of learning across borders*. Microbol. From <http://www.groningendeclaration.org/wp-content/uploads/2019/05/UNESCO-Digital-credentialing-implications-for-the-recognition-of-learning-across-borders.pdf>
- Cirlan, E., & Loukkola, T. (2020). *Micro-credentials linked to the Bologna Key Commitments. Desk research report*. <https://microcredentials.eu/wp-content/uploads/sites/20/2020/09/MICROBOL-Desk-Research-Report.pdf>
- Crow, T. (2017). *Micro-credentials for Impact: Holding Professional Learning to High Standards*. Washington, DC: Learning Forward and Digital Promise. doi:<https://digitalpromise.org/wp-content/uploads/2016/03/micro-credentialsforimpact.pdf>

- Damiano, E. (2013). *La mediazione didattica. Per una teoria dell'insegnamento*. Milano: FrancoAngeli.
- EC (2020). *A European approach to micro-credentials – Output of the micro-credentials higher education consultation group - Final report*. Brussels: Directorate-General for Education, Youth, Sport and Culture Directorate B — Youth, Education and Erasmus+.
- Felisatti, E., Serbati, A. (2015). Apprendere per imparare: formazione e sviluppo professionale dei docenti universitari. Un progetto innovativo dell'Università di Padova, *Giornale Italiano della Ricerca Educativa*, 14, VIII, 323-339.
- Felisatti, E., Serbati, A. (2017) (eds). *Preparare alla professionalità docente e innovare la didattica universitaria*. Milano: FrancoAngeli.
- Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*, Englewood Cliffs, New Jersey, Prentice-Hall.
- Lotti, A., Lampugnani, P. (Eds) (2020). *Faculty Development e valorizzazione delle competenze didattiche dei docenti nelle università italiane*. Genova: GUP Genova University Press.
- Muilenburg, L. Y., Berge, Z. L. (2016). *Digital Badges in Education*. New York: Routledge
- O'Sullivan, P.S., Irby, D.M. (2011). Reframing research on faculty development. *Academic Medicine*, 86, 421-428.
- Oliver, B. (2019). *Making micro-credentials work for learners, employers and providers*. Deakin University. Retrieved from: <http://dteach.deakin.edu.au/2019/08/02/microcredentials/>
- Orland-Barak, L., Maskit, D. (2017). *Methodologies of Mediation in Professional Learning*, Cham, Springer.
- Perla, L. (2011). *L'eccellenza in cattedra. Dal saper insegnare alla conoscenza dell'insegnamento*. Milano: FrancoAngeli.
- Perla, L. (2020). Lo sviluppo professionale del docente Universitario. Vision, organizzazione e co-progettazione nell'esperienza TLL dell'Università di Bari. *Scuola democratica*, 3, 561-572.
- Perla, L., Agrati, L.S., Vinci, V. (2019). The 'Sophisticated' Knowledge of e-Teacher. Re-shape Digital Resources for Online Courses. In Burgos D. et al. (Eds.), *Higher Education Learning Methodologies and Technologies Online. HEL-MeTO 2019*. Communications in Computer and Information Science, 1091, 3-17.
- Perla, L., Brusa, A., Vinci, V. (2018). Insegnare il paesaggio storico. Tratteggio didattico co-epistemologico. *Italian Journal of Educational Research*, 9(20), 77-101.
- Perla, L., Scarinci, A., Amati, I. (2021). *Metamorphosis of space into digital scholarship. A research on hybrid mediation in a university context*, in L.S., Agrati et al. (Eds.). Bridges and Mediation in Higher Distance Education, *Communications in Computer and Information Science*, 1344, 226-239.
- Perla, L., Vinci, V. (2018a). Dall'analisi dei bisogni formativi dei docenti universitari all'organizzazione del Teaching Learning Laboratory: la ricerca PRODID presso l'Università di Bari, *Education Sciences & Society*, 2, 120-140.
- Perla, L., Vinci, V. (2018b). TLL (Teaching Learning Laboratory) e formazione dialettica dei docenti universitari alla didattica: primi passi verso la certificazione della competenza pedagogica in Uniba, *Lifelong Lifewide Learning*, 15(32), 68-88.
- Perla, L., Vinci, V. (2021). Modellistiche co-epistemologiche per la formazione del docente universitario: il progetto Prodid Uniba, *Excellence and Innovation in Learning and Teaching. Special Issue*, 11-30.
- Perla, L., Vinci, V. (in press). *Didattica, riconoscimento professionale e innovazione in Università*. Milano: FrancoAngeli.
- Rossiter, D., Tynan, B. (2019). *Designing & Implementing Micro-Credentials: A Guide for Practitioners*. Vancouver: Commonwealth of Learning Knowledge Series.
- Shulman, L.S. (1987). Knowledge and teaching: Foundations of the new reform, *Harvard Educational Review*, 57(1), 1-22.
- Sorcinelli, M.D. (2007). Faculty development: The challenge going forward. *Peer Review*, 9(4), 4-8.
- Steinert, Y. (2010). Becoming a better teacher: From intuition to intent, In J., Ende (Ed.), *Theory and practice of teaching medicine* (pp. 73-93). Philadelphia, PA: American College of Physicians.
- Steinert, Y. (2014). *Faculty Development in the Health Professions. A Focus on Research and Practice*. Cham: Springer.
- Tågerud, Y. (2010). Pedagogical competence – experiences from an institution in the process of being merged, In Å, Ryegård, K., Apelgren, T., Olsson (2010), *A Swedish perspective on pedagogical competence*. Uppsala University (ed. or.: Att be-lägga, bedöma och belöna pedagogisk skicklighet, from: https://gupea.ub.gu.se/bitstream/2077/22232/1/gupea_2077_22232_1.pdf).
- Trentin, G., Bocconi, S. (2015). Didattica ibrida e insegnamento universitario: guideline per una progettazione efficace. *Giornale Italiano della Ricerca Educativa*, 15, 27-42.
- Yunus, K., & Li, S. (2005). *Matching job skills with needs*. Singapore: Business Times.