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ESPERIENZE

Teaching Methods and the World of Work: Best Practices in Public Administration – The Istituto Zooprofilattico Sperimentale delle Venezie.

Metodi di insegnamento e mondo del lavoro: migliori pratiche nella pubblica amministrazione – L'Istituto Zooprofilattico Sperimentale delle Venezie.

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ABSTRACT ITALIANO

In Italia, gli Istituti Zooprofilattici sono riconosciuti come centri di eccellenza sorveglianza, ricerca scientifica e servizi specializzati negli ambiti della salute animale. Essi perseguono importanti obiettivi di salute pubblica attraverso attività di controllo e monitoraggio, ricerca scientifica e servizi specializzati nei settori della sanità animale, della sicurezza alimentare e delle zoonosi. Allo stesso tempo, rappresentano anche un punto di riferimento fondamentale per la formazione continua in medicina veterinaria.

In questo contributo, verranno illustrate alcune prassi adottate dal Laboratorio Formazione e Sviluppo delle Professioni dall'Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe), con sede a Legnaro (Padova), come esempio concreto di utilizzo efficace ed efficiente di active learning e tecnologie educative nel contesto della formazione professionale.

ENGLISH ABSTRACT

In Italy, the Zooprophylactic Institutes are recognized as centers of excellence in surveillance, scientific research, and specialized services in the field of animal health. They pursue significant public health objectives through control and monitoring activities, scientific research, and specialized services in the areas of animal health, food safety, and zoonoses. At the same time, they serve as a crucial point of reference for continuous education in veterinary medicine.

In this contribution, we will present some of the practices adopted by the Training and Professional Development Laboratory of the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe), based in Legnaro (Padua), as a concrete example of the effective and efficient use of active learning and educational technologies in the context of professional training.

Introduction

The Zooprophylactic Institutes (IIZZSS) are a key operational resource for the National Health Service, playing a crucial role in public health through their activities in control, surveillance, scientific research, and the provision of specialized services. Their focus spans several areas, including animal health, food safety, and zoonoses.

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Established by national and regional laws as, technical-scientific tools of the National Health Service, these Institutes serve a variety of stakeholders, including the Ministry of Health Service, these Institutes serve a variety of stakeholders, including the Ministry of Health, regional governments, local health authorities, private veterinarians, professionals in the livestock sector, food industry operators, and citizens. These Institutes constitute an integrated healthcare system, unparalleled in Europe, offering a network of services aimed at monitoring food safety and animal health, thereby contributing to the protection of human health. In addition to their core functions, the Institutes are actively involved in the training of healthcare professionals, including both internal staff and professionals working in the fields of food safety and animal health nationwide.

Each Institute enjoys organizational autonomy, with a structure that includes multiple locations—comprising ten central offices and ninety peripheral diagnostic sections—where research and training take place in various ways to fulfill their respective mandates. At the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe) in Legnaro (Padua), the Training and Professional Development Laboratory manages the entire process of planning and implementing training activities. This process encompasses several key phases: analyzing learning needs, planning, managing, delivering, and evaluating training programs, all designed for both the Institute's internal and external personnel.

The Discipline of Continuing Education in the Zooprophylactic Institutes

Continuing Medical Education (CME) is an internationally recognized discipline, defined as the ongoing educational process for healthcare professionals following the formal completion of their initial training. Several factors have influenced the evolution of CME, including the globalization of health, interdisciplinary approaches such as evidence-based medicine, and the assessment of professional competence, healthcare impact, and the identification of health determinants (Davis, 1998). CME plays a crucial role in supporting the professional development of public health practitioners, thereby enhancing the efficiency of healthcare systems by addressing a broad spectrum of needs, particularly those arising from a rapidly changing healthcare environment (Alguire, 2004).

The role of the IIZZSS in this context is pivotal, as they are responsible for training professionals at both national and international levels, serving as scientific reference points within the veterinary field and beyond. Their training initiatives are extensive and closely aligned with their mission to promote public health. In an era where health professionals must continuously update their knowledge, techniques, and diagnostic skills to keep pace with the rapidly evolving landscape of their fields, these Institutes are indispensable (Scholtz et al., 2013). Moreover, healthcare professionals are increasingly required to navigate the rising demands and expectations of clients and other stakeholders within the veterinary industry. In contemporary healthcare, the ability to reconcile these often-conflicting values has become a fundamental aspect of professional practice (Gordon et al., 2023).

This underscores the need for continuing education to play a transformative role, moving beyond the mere transmission of content—a foundational pillar of adult education (Knowles et al., 2014; Jarvis & Griffin, 2003). Over the years, training agencies functioning

as educational entities have undergone significant transformation to meet the evolving needs of the scientific community they serve. This evolution has involved the continuous updating and refinement of teaching methodologies, fostering an ongoing reflection on the role of the learner and how education serves not only as a tool for professional development but, most importantly, as a means of personal growth. The moral dilemmas faced by professionals in this sector also seek resolution through the framework of continuous education. To address these questions, the training laboratory at IZSVe has progressively embraced a constructivist paradigm in its search for answers. This approach encourages an open mindset, actively exploring tools and methods to enhance the training offerings and steer them towards adaptive learning. In the past ten years, this laboratory has been committed to offering solutions that reconcile both the content updates necessary for these professionals and the educational need to develop additional skills (Nadin et al., 2012). In the context of Legnaro, the approach to training has consistently incorporated educational technology to innovate content delivery, effectively combining it with traditional tools. This strategy specifically aims to meet the practical educational needs of professionals, ensuring that the training provided is relevant and responds to the real, both personal and professional, challenges they face.

Teaching: Methodology and Rigor

The primary mission of the Training Laboratory at the IZSVe is the systematic design and delivery of comprehensive training programs. As previously highlighted, training encompasses more than the mere dissemination of knowledge. The Laboratory's pedagogical framework is firmly rooted in a methodology that synthesizes a variety of strategies, techniques, and approaches to optimize the learning experience. This framework places a strong emphasis on the coherence, accuracy, and validity of the employed methods.

The overarching objective is not only to facilitate the acquisition of knowledge and skills but also to ensure their effective transferability and applicability across diverse contexts (Smith, 2020). To achieve this objective, it is crucial to focus on the materials collected and used for the course, the teaching methodology adopted, and the relationship with the instructor leading the courses. These instructors are required to be experts in their respective fields, holding relevant academic qualifications and are responsible for effectively conveying scientific content to learners. In instances where instructors lack pedagogical expertise, the Laboratory's team support becomes crucial. This support begins with the course design phase and continues through the evaluation of the tools and methods that enhance the teaching process, ensuring that the educational experience remains effective and aligned with best practices.

It is therefore essential that the adopted methodology follows a well-structured approach that includes the following elements:

- a preliminary analysis of learning need, conducted to identify gaps and learning requirements of the participants;

- evaluation of criteria for outcomes established in advance to ensure an objective and systematic analysis of the course's effectiveness.

Once preliminary information on educational needs and learning preferences has been gathered, the next step is the careful selection of appropriate materials from the existing literature, in collaboration with the instructor. This process involves identifying relevant sources, critically evaluating them, and synthesizing the information to align with specific training objectives and the diverse needs of the target audience. By leveraging well-curated materials, the IZSVe enhances the quality and relevance of its educational programs, ensuring that both internal staff and external stakeholders receive accurate, up-to-date, and contextually appropriate knowledge. At this point, the instructor's teaching approach becomes crucial. The instructor must implement pedagogical methodologies that actively engage the professionals attending the courses, ensuring that the training objectives are met.

The educational mission is to make this learning experience a meaningful and lasting component of the participants' professional practice. The aim is to promote continuous learning as a living subject that stimulates both the individual and the professional, fostering a virtuous cycle of reflection on their professional actions (Tomlinson, 2019).

The training practices of the IZSVe Training Laboratory and Technology in Education

The integration of technology into teaching has significantly influenced the field of education, radically transforming the educational environment in recent years. This challenge has found particularly fertile ground in the IZSVe Training Laboratory, where, learning experts have actively employed technologies as essential tools to enhance teaching and learning processes, making them more interactive and personalized.

The continuous education model developed by the Laboratory team has been shaped by methodologies that leverage the potential of technology to engage students more dynamically while tailoring content to their individual needs (Haleem et al., 2022), and by active learning, to make participants integral to the activities (Darling-Hammond, 2017). This approach is based on the belief that fostering a more engaging and lasting learning experience helps develop the critical skills that are essential for these health professionals (Facer & Selwyn, 2021) and that the personalization of learning represents the necessary advancement that transforms the training event into a truly transformative moment (Osborne et al., 2007).

The design of the learning programs at the Training Laboratory began with a series of critical questions that prompted the IZSVe to revaluate the structure of traditional educational models. The goal was to determine which elements would best meet the learning and professional development needs of those involved in animal health and food safety (Hornby et al., 2022; Larsen et. al., 2019).

The initial question, rooted in epistemology, sought to clarify the educational concepts that underpin effective training programs. This was followed by a methodological inquiry into identifying the most appropriate tools for implementing these programs. Moreover, it was crucial to account for the unpredictability of available resources and the contextual

constraints—encompassing educational, economic, and organizational factors—which necessitated strategic compromises and decisions.

In light of these considerations, the Laboratory team identified the integration of technological environments in training as a significant response to the need for effective and efficient educational projects (Rielgman, 2007; Zhang, et al., 2021).

In IZSVe, they formed a team, which is essential for both in-person instruction and for designing and developing e-learning courses. Creating a team is a common approach, as it is rare to find one individual with all the necessary skills to design, develop, and manage a course. Even when such expertise is available, the time constraints of training typically do not allow one person to handle all tasks in succession (Allen, 2016). The design and development of effective e-learning is a multifaceted task that demands expertise in several domains, such as content knowledge, writing, illustration, assessment creation, instructional strategies, interactive design, user interface design, programming, and graphic design. Collecting appropriate content to build learning materials requires interaction between various professional figures; courses necessitate the contribution of multiple professionals. It is a team effort where there are different roles, but a single goal. Each individual brings their own knowledge to the table to achieve the objective. The aim is to foster a dialogue between the technical-scientific dimension and the educational one (Ferranti, Nadin, 2012).

In the first phase of the work, the course design and development team collaborate with the content expert to translate the specialized language into one that is suitable for the needs of the recipients. In the second phase, the final product represents a fusion of content and the most appropriate educational methodology.

After aligning on the topics with the experts, the next step is to create a self-contained instructional unit (module) that includes video lectures, examples, exercises, multiple-choice tests with compensatory answers, and other interactive activities, such as image/word matching. This can be done using authoring software or by directly setting up the content in the learning management system (LMS). In the former case, once all modules are assembled using the authoring software, they are packaged to interface seamlessly with the chosen LMS. (Ricaldi & Lunardi, 2016).

Following the constructivist approach, the learning process is built through the interaction between prior knowledge and newly acquired information. In the case of interaction with an LMS, learners make decisions regarding which information to access and when, establishing an interactive relationship with the materials. The interaction takes place within the reciprocal activity established between the learners and the multimedia learning system, where the learners' responses depend on the reactions of the learning system (Evan & Sabry, 2002).

At the IZSVe, Moodle (Modular Object-Oriented Dynamic Learning Environment) has been selected as the platform, given its open-source nature and extensive customization options.

The experience of the blended training course 'Developing the Ability to Work Together Following the Path of Quality'

The experience 'Developing the Ability to Work Together Following the Path of Quality' involved both managerial and operational healthcare staff from IZSVe in a shared journey with a dual objective: to promote and enhance teamwork skills and to improve/consolidate the knowledge, skills, and competencies required for the application of specific procedures outlined by the Quality System. The course was characterized by the experimentation with interactive teaching methodologies inspired by the principles of edutainment—a term derived from the fusion of 'educational' and 'entertainment'—and gamification. The project was structured around the metaphor of a regatta, symbolizing a journey aimed at achieving educational objectives through teamwork. All activities were conducted in small groups, envisioned as actual crews engaged in a challenge that led to the development of processes for validating and verifying the performance of a testing method, ensuring the quality standards of the activities carried out in IZSVe laboratories. The course was organized into various markers (modules), representing the necessary steps to reach a complex objective, where the contribution of each crewmember, according to their role in the team, was crucial.

In addition to andragogical principles and adult learning theories, the chosen approach also took into account various contextual constraints:

- the large number of potential participants (over 200 healthcare professionals);
- the geographical distance between the 11 different IZSVe locations across northeaster Italy and the impossibility of personnel taking collective leave from laboratory activities;
- the diverse professional profiles (veterinarians, biologists, chemists, laboratory technicians, and administrative staff in the healthcare sector);
- the varying levels of competence, experience, and involvement of personnel in the phases of validation and verification of a testing method.

The process of selecting effective strategies and methods to achieve the set objectives took into account both the theoretical principles and the contextual constraints outlined above, leading to the development of a blended learning pathway.

The playful approach to learning proved motivating for participants and stimulated interaction and engagement among each crewmember in reaching the markers. Additionally, the experience fostered greater awareness of the educational value of collaboration and dialogue in achieving a common goal.

The decision to implement the project in a blended format allowed for optimal management of IZSVe's contextual constraints, as it provided the 168 participants who completed the course with:

- high flexibility in managing the time and place dedicated to training (participants could connect whenever, for however long, and from wherever they wanted—home or work);
- minimal physical travel, leading to a reduction in travel expenses and absences from work;

- from a pedagogical perspective, the promotion of individualized and personalized learning paths (each participant follows their own pace for content assimilation and has the opportunity to explore specific topics of interest);
- the use of many-to-many communication tools (e.g., discussion forums), facilitating interaction and exchanges among professionals with diverse expertise.
- Each marker represented a training module characterized by a series of recurring elements:
- Clear articulation of the module's learning objectives: Adult learners are goal-oriented and therefore need to identify the intended outcomes of the learning process.
- Discussion forums: These served as platforms for communication with online tutors and among participants, providing both technical and methodological support throughout the various phases of the course, while also promoting peer-to-peer collaboration and discussion.
- Self-assessment tools (ex-ante and ex-post): Each module included a self-assessment activity at the beginning and end, designed to support learners in identifying the gap between their initial knowledge and their learning outcomes.
- Educational materials: Primarily consisting of video lectures delivered by experts, interspersed with intermediate self-assessment exercises aimed at evaluating learners' comprehension of the content.
- Online exercises: These required participants to rework the content covered in the video lectures, engage in peer-to-peer discussions, and ultimately consult with experts to receive feedback on the adequacy of their work.

The course included the issuance of specific badges upon the completion of the activities required for each training module. A badge is a digital credential, increasingly common in online courses, used to identify the knowledge or skills acquired through a particular learning pathway. This practice has gained international traction through a project called 'Mozilla Open Badges' (http://www.openbadges.org/). The issuance of badges followed the activity completion criteria: the e-learning platform sent a notification to each participant once all the required activities for a given module were completed. The use of this reward tool proved effective in supporting the challenge and competition dynamics as well as the results-oriented focus of gamification.

At the end of the course, the three winning teams of the 'regatta' were announced based on criteria that had been clearly communicated at the start of the course:

- adherence to deadlines for completing the activities in each module;
- peer evaluation of the final projects presented in the dedicated session, which focused on the development of a validation/verification process for testing method performance in their respective laboratories;
- tutor evaluation of the levels of participation and interaction within the groups, which were monitored throughout the course in the spaces dedicated to course activities.

Several months after the conclusion of the course, participants were asked to complete a semi-structured questionnaire, aimed at investigating specific parameters related to the course (usefulness for their training/upskilling, clarity of learning objectives, effectiveness of communication with tutors, colleagues, and supervisors) as well as more general aspects concerning participants' perceptions of the organization within their own departments and their personal/individual views on training. The goal of the survey was to highlight potential correlations between the educational impact and course-related variables (usefulness, clarity of objectives, etc.), individual variables (personal interest and propensity for training), and organizational variables (organizational climate). Among the particularly noteworthy results was a positive correlation between a high perception of the usefulness of what was learned and the view of training as a transformative tool for continuous development, fostering not only professional growth but also personal self-realization.

Conclusion

In this Laboratory, traditional tools and technology are integrated harmoniously, functioning like an orchestra where each element plays its part in the same symphony. This approach ensures that adult education is in tune with the evolving professional development needs of participants. The IZSVe Laboratory is ideally always focused on what has yet to come, continuously searching for new solutions and projects that anticipate the evolving needs of continuing education, with the ultimate goal of fostering human potential and fulfilment through knowledge.

Note

This contribution was written in a spirit of collaboration among all the authors: Paola Rigoni wrote and edited the introduction, the first and second paragraphs; Guido Ricaldi wrote and edited paragraph 3; Anna Nadin wrote and edited paragraph 4. Grazia Manca, Silvia Ravagnan, and Gloria Piovan reviewed the entire manuscript.

Bibliografy

Alguire, P. C. (2004). The future of continuing medical education. *The American Journal of Medicine, 116*(11), 791–795. doi:10.1016/j.amjmed.2004.03.005

Allen, M. W. (2016). *Michael Allen's guide to e-learning: Building interactive, fun, and effective learning programs for any company.* John Wiley & Sons.

Darling-Hammond, L., Hyler, M., Gardner, M. (2017). Effective teacher professional development. *Learning policy institute*.

Davis, D. (1998). Continuing medical education: Global health, global learning. *Bmj, 316*(7128), 385–389. doi:10.1136/bmj.316.7128.385

Davis, M., & Forrest, K. (2009). *How to teach continuing medical education.* John Wiley & Sons.

Evans, C., Sabry, K. (2002). Evaluation of the interactivity of web-based learning system: principal and process. *Innovation in education and teaching international, 40*(I), 89-99.

Facer, K., & Selwyn, N. (2021). Digital technology and the futures of education: Towards 'Non-stupid'optimism. *Futures of Education Initiative, UNESCO.*

Ferranti, C., Nadin, A., Ravarotto, L. (2012). SAIA Learning Community: A blended project experience. In *EDULEARN12 Proceedings* (pp. 155-163). IATED.

Gordon, S., Parkinson, T., Byers, S., Nigito, K., Rodriguez, A., Werners-Butler, C., Guttin, T. (2023). The changing face of veterinary professionalism—implications for veterinary education. *Education Sciences, 13*(2), 182.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers, 3*, 275–285. doi:10.1016/j.susoc.2022.05.004

Hornby, G., & Greaves, D. (2022). *Essential evidence-based teaching strategies.* Springer.

Jarvis, P., & Griffin, C. (2003). *Adult and continuing education: Adult education-viewed from the disciplines.* Taylor & Francis.

Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2014). The adult learner: The definitive classic in adult education and human resource development Routledge.

Larsen, C. M., Terkelsen, A. S., Carlsen, A. F., & Kristensen, H. K. (2019). Methods for teaching evidence-based practice: A scoping review. *BMC Medical Education, 19*(1), 259. doi:10.1186/s12909-019-1681-0

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

Nadin, A., Piovan, G., Ravarotto, L. (2012). Esperienze di blended learning: il modello «flipped classroom» applicato alla formazione continua di professionisti che operano a tutela della salute pubblica. *Conference Proceedings*, Moodle moot, MediaTouch 2000-Centro Multimediale di Ateno, Università degli Studi di Padova

Osborne, J., & Hennessy, S.Literature review in science education and the role of ICT: Promise, problems and future directions Memory, and Cognition, 34, 945-959. https://doi.org/10.1037/0278-7393.34.4.945

Ricaldi, G., Lunardi, L. (2016). Sicurezza alimentare e apprendimento interattivo. In Ravarotto (a cura di), *Comunicare il rischio alimentare*, 96-102 . Carocci.

Scholz, E., Trede, F., & Raidal, S. L. (2013). Workplace learning in veterinary education: A sociocultural perspective. *Journal of Veterinary Medical Education, 40*(4), 355–362.

Smith, R. (2020). *Teaching and learning in higher education: Disciplinary approaches to educational enquiry.* Routledge.

Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research & future directions. *Computers and Education: Artificial Intelligence, 2* doi:10.1016/j.caeai.2021.100025