

D. Bosio, G. Garzaro, E. Bergamaschi, D. Trombetta, F. M. Daza, E. Pira*

EMERGING NEEDS IN OSH: A NEW MASTER IN OCCUPATIONAL SAFETY AND HEALTH BY ILO AND UNIVERSITY OF TURIN

UDK 331.45:613.6.06
RECEIVED: 2018-03-20
ACCEPTED: 2018-08-31

SUMMARY: Public and private sector organizations worldwide are increasingly concerned with improving occupational safety and health (OSH) and increasingly seek skilled OSH professionals. Becoming an OSH professional requires a multidisciplinary training. Since 2012, the University of Turin, along with the International Training Centre of the International Labour Organization (ITC-ILO), the International Labour Office (ILO) and the International Commission of Occupational Health (ICOH) collected this challenge and opened a master course in OSH.

The aim is to assess the consistency and effectiveness of the emerging educational proposal.

The proposed programme is opened to participants from both developing and developed countries. Besides a preparatory Internet-based Distance Learning Phase, enabling participants with different backgrounds to reach an adequate level of knowledge, this one-year programme includes a residential period, followed by another distance phase for the preparation of the dissertation. Residential Phase of Turin includes classroom training, study visits to selected enterprises and related training sessions.

From 2007 to 2018 more than 300 participants applied first to the Postgraduate course and then to the Master in OSH, with variable occupational backgrounds such as public institutions, private companies and Universities. 65,7% (SD 8,1%) of the participants were enrolled to the Residential Phase, with a mean age of 38 years (SD 7,4), 55,9% (SD 5,2%) achieved the Master Degree. Different evaluation strategies were used. The average satisfaction survey score was high (4,28; SD 0,67). At the end of the training period, participants learnt to manage the use of OSH procedures and techniques and health management systems. The results of the profit and satisfaction questionnaires demonstrate the effectiveness of the course.

Keywords: occupational safety and health, health education and training, blended learning, developing countries, International Labour Organization

INTRODUCTION

Public and private sector organizations worldwide are increasingly concerned with improving occupational safety and health (OSH). In both developed and developing countries, the rapid pace of technological change, combined with the persistence of unsafe or environmentally threatening working conditions mostly in some specific groups of workers employed in informal econo-

*Davide Bosio, MD, PhD, (davide.bosio@unito.it), S.C. Occupational Medicine U- Occupational Hospital Risks, Health and Science City Hospital Turin, Giacomo Garzaro, MD, (giacomo.garzaro@unito.it), Enrico Bergamaschi, MD, (enrico.bergamaschi@unito.it), Daniela Trombetta, (daniela.trombetta@unito.it), Unit of Occupational Medicine, Department of Public Health Sciences and Pediatrics, University of Turin, Turin, Italy, Félix Martín Daza, (F.Martin@itcilo.org), ILO International Training Center in Turin, Italy, Enrico Pira, MD, (enrico.pira@unito.it), Unit of Occupational Medicine, Department of Public Health Sciences and Pediatrics, University of Turin, Turin, Italy.

my, small- and medium-sized enterprises, agriculture, or migrant and contractual workers, support the need to create a safe, healthy working environment and to promote a safety culture at the workplace. The poor state of workers' health protection worldwide, especially in resource-limited settings and the growing pressures of a globalized world increasingly regulated by norms and guidance documents that ask for improved occupational settings are forcing many Organizations to seek skilled OSH professionals that can guide them through an effective change in the workplace health and safety processes (WHO, 2017).

Many national and international institution have demonstrated a scarce access of workers to occupational health services in spite of an evident need virtually at each place of work. One of the main reasons is the lack of Occupational Health Professionals (OHP), particularly in the developing and newly industrialized countries (Goldstein et al, 2000). This observation takes on particular importance if we think that the most hazardous jobs and the most exposed populations (approximately eight out of 10 of the world's workers live in these countries) tend to have the least number of occupational safety and health experts.

Even in the most industrialized countries, the number of OHP is sometimes inadequate. For example statistics on the number of occupational physicians specialists and doctors providing occupational health services in EU shows great discrepancies going from fewer than 10 doctors per 100.000 workers in Slovakia, Romania and Bulgaria to more than 40 per 100.000 workers in Italy, Finland and Latvia. A comparison between the number of Occupational Doctors and the percentage of workers covered by Occupational Services shows significant between-Country variations. Bulgaria, for example, has only nine occupational physicians per 100.000 employees and yet a coverage rate of 97%, while Finland has 55 per 100.000 to cover 85% of workers (Kempa, 2014). Many times OHPs are far less than the number considered necessary, especially for certain activity sectors, as it can be seen from the data taken by the ESENER survey on general safety and health

risks in the workplace and how they are managed that was conducted on thousands of businesses and organisations across Europe (ESENER, 2014). On a global level in 2008-2009 WHO surveyed Member States to establish a monitoring baseline regarding the progresses in the implementation of the Global Plan of Action. Data were collected from 121 countries (response rate 61%) that returned questionnaires were analysed globally. Some interesting data dealt with OHP situation worldwide. In 35% of the countries, mostly those in the low income group, human resources for occupational health were not at all sufficient or absent. One of the main problems was the lack of national scientific entities specialized in occupational health able to provide support to occupational health services, capable to offer training of occupational health professionals and specialized in developing standards for occupational health and safety; 41% of the countries, most of them in the Eastern Mediterranean, African and American regions, lacked research institutes for occupational health. Occupational health in training in various disciplines was not included or it was rated as insufficient in several countries. Postgraduate training in occupational health has been most commonly found in the disciplines of medicine, public health, and nursing. In medicine, Occupational health degree programmes are well represented in European and American regions, only few have been introduced in the South-East Asian and African regions. This is the main reason why WHO suggested to introduce further postgraduate training in relevant disciplines, building capacity for basic occupational health services and incorporating workers' health in the training of primary health care practitioners and other professionals needed for occupational health services (WHO, 2013).

Despite these recommendations, the activation of Postgraduate Courses or Master Course in Occupational Safety and Health that enrolled many different OSH professionals has been limited, and few examples can be currently found (Forst et al, 2009).

The training of specialists other than the medical experts for the multidisciplinary occupational health team, in fact, is much less systematically organized in most countries. Where training is available, it is oriented to clinical occupational medicine only which, though important, does not give a full response to the needs for expertise in a preventive workplace-oriented occupational health service (*Recommendation of the second meeting of the WHO Collaborating Centres in Occupational Health, 1994*).

The purpose of the article is to illustrate the main characteristics of a course able to meet the requirements stated by the World Health Organization and to give insights on the effectiveness of educational program in a short time perspective of improvement.

SUBJECT AND METHODS

Objectives

In 2007 the University of Turin and the International Labour Organization (ILO-ITC) decided to develop a state of the art Postgraduate Course in OSH aimed at the three main OSH professions (occupational safety, industrial hygiene, occupational medicine) and to many different professionals who are concerned with the prevention of workplace injuries and illnesses such as hygienists, physicians, chemists, engineers, health-care providers, public health workers, union representatives, labor inspectors, environmental health officers, managers in ministries of labor and health, and others with a university degree but without previous specialization in occupational safety and health. The main objective of the course was to facilitate the knowledge and skills required for dealing effectively with safety and health management. The philosophy and the main principles that guided the planning of the programme were:

- Tackle the main topics and the main future developments of occupational health practice with teachers of proven national and international experience. Because of the wide variety of levels and fields of knowl-

edge and different industrial clusters in the countries of origin, the topics are very extensive and comprehensive.

- Associate theoretical extensive training to field examples coming from different industrial realities.
- Be flexible and adapt to professional figures with very different study backgrounds, different work contexts and community settings.
- Offer knowledge that can be applied in different countries.
- Give the possibility to create a beachhead to increase the OSH culture in the participant's home-countries.

At the end of the course students were expected to be able to:

- Organize the efforts of an enterprise to improve its OSH.
- Formulate, implement and evaluate a safety and health management system for an enterprise, incorporating essential OSH concepts and fundamental techniques of OSH management.
- Manage the resources to conduct all prevention activities are required in an OSH management system.
- Advise employers and workers on OSH technical requirements.

In 2012 the Postgraduate Course was converted into a First Level Master's degree. After the conversion, the International Commission on Occupational Health gave its sponsorship to the project.

Course structure and content

The course is held in English, it is a one year programme and it has been organized into three major learning cycles, one consisting of 20 weeks of on-line distance learning, another consisting of 11 weeks of residential training at the ITC-ILO campus in Turin, Italy and a final distance phase of 23 weeks for the preparation of the dissertation. It is based on a blended delivery (Internet-based distance learning + face-to-face sessions +

applied research work), learning is experiential and results-based and methods are participatory, application-oriented, and make extensive use of information and communication technology. 45-50 resource persons are dedicated to the Master, Senior professors from the University of Turin and other renowned universities, OSH experts from the ILO and other international organizations, OSH specialists from enterprises, specialist tutors who will support and interact with the participants throughout the programme. Every year a minimum of 18 to a maximum of 35 students is expected to participate.

The 1st cycle (550 hours – 20 weeks) is a preparatory, Internet-based Distance Learning Phase. This phase includes 370 hours for self-studying and exercises and 180 hours for preparing and submitting the assessments and participating to technical discussions. Participants have access to an on-line platform through which they are able to learn in an individual way. They receive support from tutors with expertise in the subject matter; participate in a forum, use the documentation centre, and network. Participants are introduced to the fundamentals and basic concepts of OSH through eight modules (see Table 1) that are preparatory to the Residential Phase. As said this is a Distance Learning Phase during which the students must complete the required modules, and can contact the tutors at any time. Times are very tight so it is an extremely selective phase. It enables participants with different levels and fields of knowledge to reach an adequate and homogeneous level in order to take advantage of the Residential Phase.

The 2nd cycle (550 hours – 11 weeks) is a face-to-face learning period that is held in Turin, Italy, at the International Training Centre of the ILO. This phase includes a classroom training (315 hours) and a study visits in selected enterprises and related training sessions (125 hours), and 110 hours of assessment. Technical visits to industries and other productive sectors provide the opportunity for discussing with professionals in OSH management in various environments about risks and preventive measures adopted in the different enterprises of national and international prominence such as Ferrero, Pirelli & C, Martini e Rossi, Leonardo, Maserati, AMIAT, Mines of San Vittore and others, with very high standards for safety and health in the workplace and advanced safety management systems. Teachers use lectures, discussions, exercises and other interactive learning activities to strike a balance between theory and practice and to stimulate discussion among the participants and professors. A practical approach based on the analysis and resolution of OSH issues are taken. The contents are split into 11 thematic topics (one for each week). The modules in this phase are shown in Table 1.

The 3rd cycle (400 hours – 23 weeks) consists of the preparation and submission of the final Master thesis on OSH specific topics, of specific relevance in the student own workplace or his own country, chosen under the supervision of the tutor. Participants work individually in their country for the preparation of their Master thesis, assisted at distance by tutors and professors with OSH expertise.

Table 1. Master cycles and modules activities**Tablica 1. Ciklusi i moduli aktivnosti**

Master Cycle	Modules/Activity
1st Cycle: Preparatory Internet-based Distance Learning Phase (550 hours – 20 weeks)	<ul style="list-style-type: none"> ■ Module A1: Introduction to Occupational Safety and Health ■ Module A2: Occupational Safety ■ Module A3: Occupational Hygiene ■ Module A4: Occupational Medicine ■ Module A5: Occupational Psychosociology and Ergonomics ■ Module A6: Organization of OSH at the National Level ■ Module A7: Participatory Approaches for the Improvement of Working Conditions ■ Module A8: Organization of OSH at the Enterprise Level
2nd Cycle: Residential Phase of Turin (550 hours – 11 weeks).	<ul style="list-style-type: none"> ■ Module 1: Safety Techniques ■ Module 2: Management Competences ■ Module 3: Major Hazard Control ■ Module 4: OSH Management Systems ■ Module 5: Physical Agents ■ Module 6: Occupational Hygiene Techniques ■ Module 7: Occupational Toxicology and Medicine ■ Module 8: Ergonomics ■ Module 9: Psychosocial Factors and Health Promotion ■ Module 10: Teaching Skills ■ Module 11: Organization and Management
3rd Cycle: Preparation of Master Thesis Phase (400 hours – 23 weeks).	Preparation of Master thesis

Learning assessment strategies

The evaluation strategy uses different types of assessment in the different cycles. Participants are given tools to check their own level of knowledge and produce feedback on their learning progress (self assessment). Systematic assignments and exams assess the knowledge and skills acquired throughout the programme. Participants need to complete and submit the compulsory assignments and exams for each module, and get the review and approval of the tutor before the prescribed deadlines. The dissertation has to be approved by the scientific committee (formal assessment). Continuous monitoring of the programme is undertaken by the activity manager, including participants' opinions, and indicates any necessary corrective measures to be taken (continuous monitoring). At the end of the programme, participants express their opinions about the course's topics, activities, administration and organization in a fi-

nal evaluation form (final evaluation by students, every item is scored between 1-low and 5-high).

Qualifications awarded

The First Level Master belongs to a 2nd cycle programme and has been intended to provide students with further specialization or higher continuous education after completion of the 1st cycle. A diploma of First Level Master in Occupational Safety and Health and a transcript (60 certified university credits) is awarded from the University of Turin to those participants who satisfy the administrative and documentary requirements of the University of Turin, satisfy the attendance requirements, get the tutors' approval on the required assignments within the set deadlines and pass the prescribed examinations demonstrating the level of competence required by of the scientific committee, get the approval of the scientific committee on the dissertation within the set deadlines.

In accordance with the objectives of the course the International Training Centre of the ILO (ITC-ILO) has signed a Memorandum of Understanding (MoU) with the Board of the Certified Safety Professionals (BCSP) of the United States (BCSP, 2018). Students who have earned the diploma of Master in Occupational Safety and Health may apply to take the examination to become Certified Safety Professional (CSP) without taking the BCSP ASP Examination.

RESULTS

From 2007 to 2018 more than 300 participants from all over the world applied to the Master. Every year the request for participation has reached the maximum number of participants (35). Given the urgent pace and the considerable effort required to the students to successfully complete the modules provided in the Distance Learning Phase, some students weren't able to get to the Residential Phase (Figure 1). In the last 5 years (from 2012 to 2017) the average percentage of students that gained access to the Residential Phase was 65,7% (SD 8,1%).

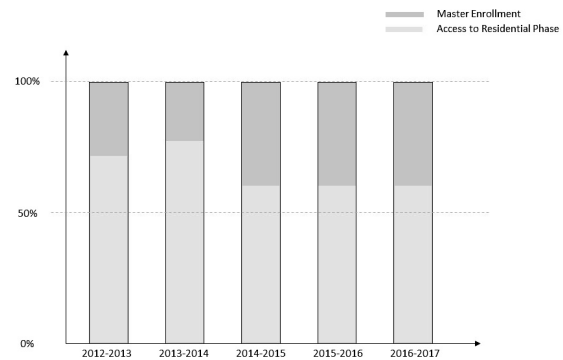


Figure 1. Percentage of students that gained access to the Residential Phase in the last 5 years (2012-2017)

Slika 1. Postotak studenata koji su pristupili Rezidencijalnoj fazi u zadnjih 5 godina (2012.-2017.)

The following tables and figures show the demographic characteristics and the country of origin of the participants that accessed the Residential Phase. The number of participants has increased in recent years, particularly since the course has become a Master, probably for a better initial background of the participants who were facing a one-year course (Figure 2).

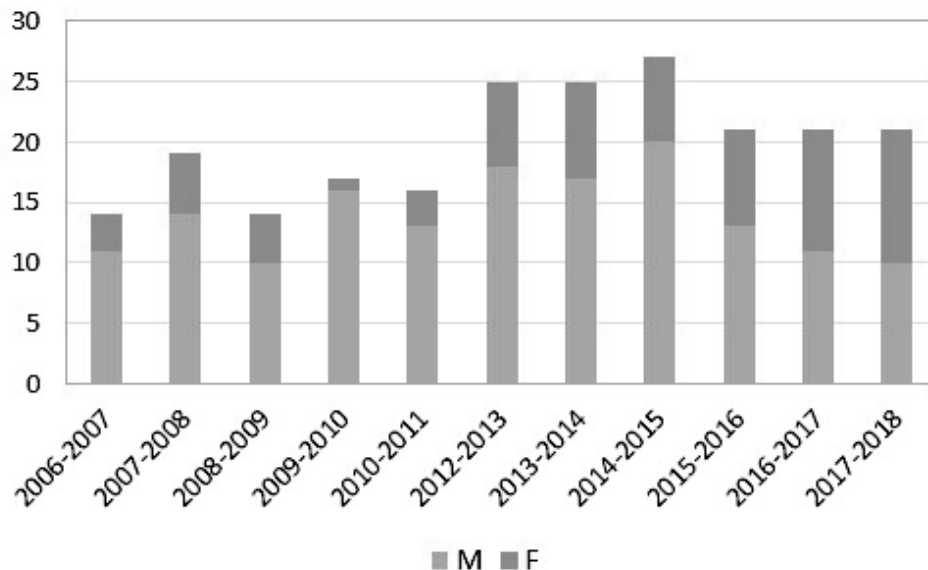


Figure 2. Number and gender of students that accessed Residential Phase (2006-2017)

Slika 2. Broj i spol studenata u Rezidencijalnoj fazi (2006.-2017.)

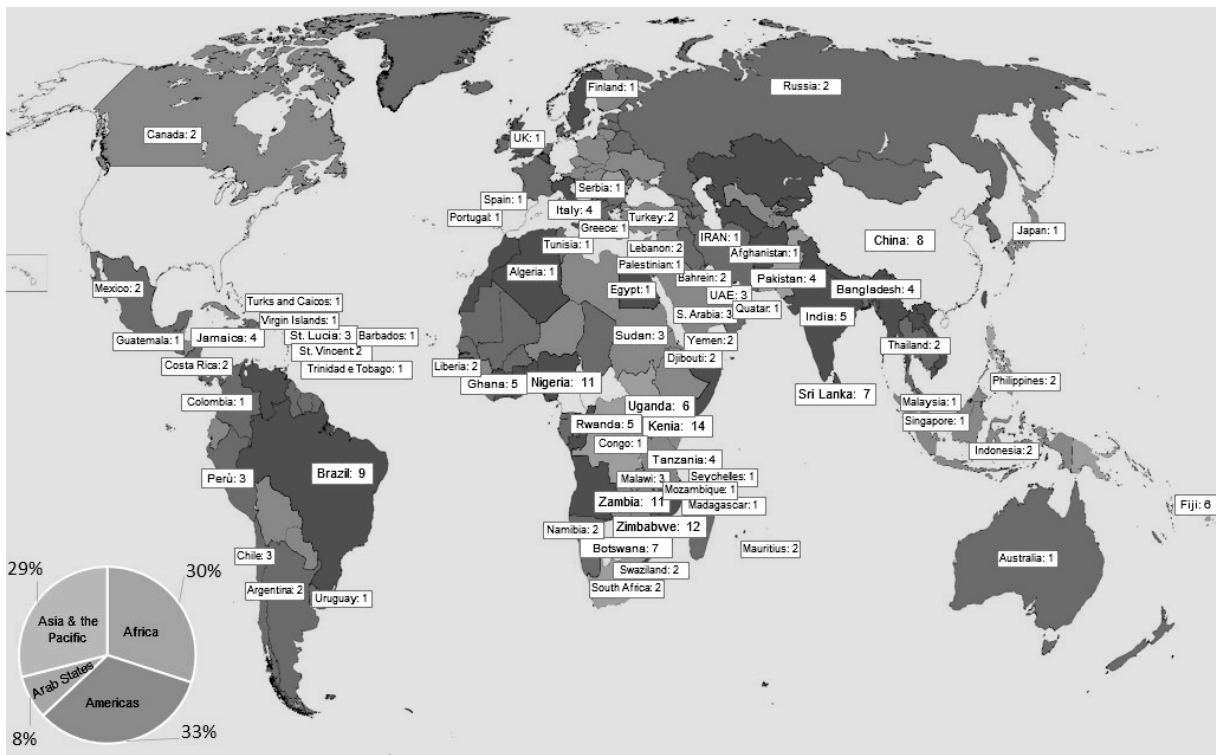


Figure 3. Geographical distribution of the participants that had access to the Residential Phase between 2007-2018 (73 Countries)

Slika 3. Geografska distribucija sudionika u Rezidencijalnoj fazi 2007.-2018. (73 zemlje)

The mean age of the participants was 38 years (SD 7,4), for males 39 years (SD 7,7) and for females 36 years (SD 6,7). There has always been a preponderance of male subjects even though this discrepancy has been reduced in the recent years.

The programme involved participants from both developed and developing countries (Figure 3).

The geographical origin of the participants shows a good distribution and dissemination worldwide, with 30% of students coming from Africa, 29% from Asia and the Pacific, 33% from Americas and 8% from the Arab States and a small percentage from Europe.

The Master have always had a good attendance from students that belonged to public institutions. An increase in participation of subjects belonging

to private companies was seen over the years, a sign of a greater attention on OSH as well in historically less sensitive countries (Figure 4).

Students attending the course were public health workers, union representatives, labor inspectors, environmental health officers, managers in ministries of labor and health, and others.

Figure 5 shows the percentages of students that passed the Residential Phase and were able to achieve the Master course.

The average percentage of students that achieved the Master course in the past 5 editions of the course, was 55,9% (SD 5,2%).

In the following table the results from the final evaluation of the students are shown (response rate 100%).

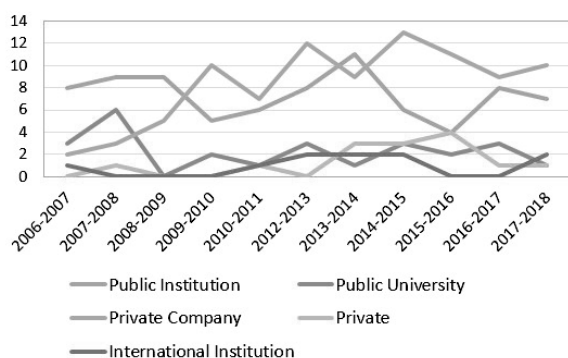


Figure 4. Working institutions of students that participated to the Residential Phase between 2007-2018.

Slika 4. Radne institucije studenata sudionika do Rezidencijalne faze 2007.-2018.

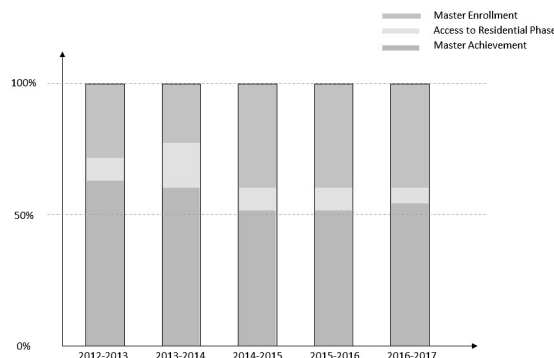


Figure 5. Participants that got the diploma of First Level Master in Occupational Safety and Health (years 2012-2017)

Slika 5. Sudionici s diplomom Prve razine magisterija u zaštiti na radu (2012.-2017.)

Table 2. Items in the final evaluation of the students and scores between 0 (not satisfied at all) and 5 (very satisfied) (average, SD and % of 4 and 5) in the last 5 years

Tablica 2. Stavke u konačnom vrednovanju programa od studenata, ocjene 0 (nezadovoljan) do 5 (vrlo zadovoljan); (prosjeak, SD i % 4 i 5) u zadnjih 5 godina

Theme	Question	Average	SD	% 4-5
Preliminary information	Before participating in this activity, did you have enough information to understand whether it could meet your learning needs?	3,92	0,87	72,0%
Achievement of objectives	To what extent were the activity's objectives achieved?	4,30	0,57	93,7%
Contents appropriate to objectives	Given the activity's objectives, how appropriate were the activity's contents?	4,25	0,66	87,9%
Gender dimension in the training	Have gender issues been adequately integrated in the training?	4,07	0,91	77,8%
Learning methods	Were the learning methods used generally appropriate?	4,01	0,70	76,3%
Resource persons	How would you judge the resource persons' overall contribution?	4,15	0,65	83,5%
Group working relations	Did the group of participants with whom you attended the activity contribute to your learning?	4,23	0,67	86,0%
Materials	Were the materials used during the activity appropriate?	4,24	0,72	83,4%
Organization	Would you say that the logistics of the activity were well organized?	4,43	0,61	92,4%
Secretariat	Would you say that the administrative support/secretariat was efficient?	4,83	0,36	98,1%
Study tour/visit	Did you find the study tour/visit useful?	4,12	0,91	74,2%
Relevance to participant's job	How likely is it that you will apply some of what you have learned?	4,60	0,59	93,0%
Relevance to your organization's needs	How likely is it that your institution/employer will benefit from your participation in the activity?	4,52	0,68	91,1%
Overall quality	Are you satisfied with the overall quality of the activity?	4,25	0,55	92,2%
Total		4,28	0,67	85,8%

Given a score of 4 (80%) acceptable, the course evaluation has always shown high scores and the reception of the course has always been very high.

DISCUSSION

Training programmes in OSH are the milestone for prevention in the workplace, even though it must be remembered that broader socioeconomic factors can affect workers' safety and health conditions and their ability to affect changes in these settings. Increasing the knowledge of workers, OSH professionals, managers and policy makers and enforcers on risk factors, hazards, and the ability to introduce safe work practices can lead to safer and better workplaces.

The target of a training programme determines its social impact: this will be marginal for an individual worker aimed course, even if useful; it will be significant instead for a course that addresses managers, supervisors and even more policy makers and enforcers that have the possibility to affect entire sectors and can impact OSH systemically up to a society as a whole.

A course that aims to facilitate the knowledge and skills required for dealing effectively with safety and health management needs to reach the widest possible audience, both meaning different professionalism, including subjects that have relevant positions and can "make the difference" under an OSH point of view, and a wide geographical area, particularly developing countries.

Thanks to the International Labour Organization (ILO, the tripartite United Nations Agency that brings together governments, employers and workers representatives of 187 member states, to set work standards, develop policies and devise programmes promoting decent work for all women and men), and specifically the ITC (International Training Center of the ILO) the course involved many participants from both developing and developed countries, and nowadays allowed to reach students from 73 different countries. A second goal achieved was to reach people with different study backgrounds, work and commu-

nity settings, and reach subjects that could positively make the difference from their home working positions, both in the field of education and in the field of occupational health policies.

The upper illustrated characteristics would not be sufficient in absence of an adequate number of students. Between 2006 and 2017 more than 300 subjects asked to be enrolled in the Master programme and, despite the complexity of the course, more than a half of those enrolled from the beginning of the programme earned the diploma of First Level Master in Occupational Safety and Health. Dealing with the gender of the participants, it must be said that OSH professions has always been mainly carried out by male subjects, and this is even more true in developing countries. A positive effect of the Master was to attract year after year more and more female students, increasing the chance of a better job placement.

This wide targeted audience, even if not always easy to manage, offer a unique opportunity to share different experiences, standardize some key points in OSH and develop common OSH management methodologies to take back home. It also give the opportunity to develop professional networks through the world.

Becoming a safety and health professional requires multidisciplinary training. The OSH profession calls for a broad-based educational background combined with specialized knowledge in physical sciences (medicine, physics, chemistry and engineering) and social sciences (behaviour, motivation and communication) together with the principles and concepts of management.

As mentioned in the literature there are not many examples on the design of master in OSH (*O'Connor et al, 2015*). OSH education and training programmes may use a variety of approaches to reach their target audiences. In this case a blended delivery was chosen with experiential and results-based learning methodologies and participatory, application-oriented methods, with an extensive use of information and communication technology.

Different methodologies has been used in the different phases. The first phase has been designed to be a "Distance Learning Phase". Distance learning is defined as "a separation in time and/or space between the learner and the instructor." (*Jeun et al, 2008*). Advances in Internet technologies brought to an increase in the use of distance learning, and even though some uncertainties are still present, it has been shown that this method can lead to results that are similar to those of traditional methods (*Cook et al, 2008*).

In this course it was decided to use an asynchronous distance learning methodology, to allow learners to participate in learning activities when it is suitable with their schedule and everyday workloads. Furthermore it allows the students to review the information at their own pace and on multiple occasions.

As demonstrated by Cook et al (*2008*) Internet-based learning has a positive outcome with a wide variety of students, teaching contexts, clinical topics, and learning outcomes, even more so if it is associated to face-to-face training. In this master the Internet-based learning has been considered effective by the great majority of the students, especially since accompanied by tutors that have been able to follow the learners through the Distance Learning Phase and to clarify any doubt on exercises and discuss ideas during technical forums. The prompt interactions and feedbacks with the tutor, consistently with the literature findings (*Miller et al, 2011, Zhang, 2005*), have assisted students to reach the highest gratification and the most effective learning outcomes, as demonstrated by the results achieved in the Residential Phase. The feedbacks were considered very helpful in reinforcing learning behaviors and encouraging reflection on mistakes.

The second phase has been designed to be a Residential Phase. In this phase a classroom training methodology, a study visits methodology and a small group activity methodology have been chosen. Classroom training has been chosen to improve the training efficacy in the core part of the course, to focus on the participant needs, to learn from other participants by empowering the face-

to-face interaction, to facilitate the building-up of personal networks and relationships and to offer a range of learning situations to enhance analytical and problem solving skills. The study visits are a very effective tool to enrich the notions that have been learnt in the classroom and strengthen students cultural heritage with a broader view gained with active demonstrations on the field. Students have the opportunity to deal with specialists of enterprises of national and international prominence with very high standards for safety and health in the workplace and advanced safety management systems and to gain practical knowledge.

The third phase is devoted to the preparation of Master Thesis. In this phase the student must demonstrate that he is able to apply the concepts learnt during the Distance Learning Phase and the Residential Phase and to write a thesis on OSH topics of specific relevance in his own workplace or Country. This phase is extremely delicate and requires constant contact between the student and the tutor to achieve an organic and meaningful scientific work.

All the different phases required an accurate analysis of teaching methods and materials, given the heterogeneity of the participants. As stated by Massett, a wide range of factors must be considered when examining cultural appropriateness of OSH materials (*Massett, 1996*). In designing training activities it is important to consider the cultural context of participants, understand cultural values and beliefs that may affect behavior. To overcome the possible problems it is important to involve members of the intended audience in the design and develop the materials and, if this is not possible, the materials should at least be tested with the target audience. The course methodology and materials have been group tested during the different course editions and now they are well appreciated and valued positively.

The efficacy of the teaching methods was determined through self assessment methodology, systematic assignments and exams and continuous monitoring. The results show high percentages of satisfaction and the overall quality has been considered high.

When dealing with the evaluation of effectiveness it is important to demonstrate that the intervention has an impact (*Kirkpatrick, 1994*). The evaluation of the programme's long-term impacts has to be considered, to be sure that the structure of the course and the methodologies used are consistent with the aims set. Who has applied to the programme? How many individuals have undergone training and what is their professional background? How have participants utilized what they learned—to conduct preventive activities in the workplace, the community, or at the government level? And, ultimately, how have these programmes impacted the number and rate of occupational injuries and illnesses?

The long-term effectiveness evaluation process of the course is under study and it will be improved in the next years.

To date the course has been positively evaluated by the Board of the Certified Safety Professionals (BCSP) of the United States.

CONCLUSIONS

There is an increasing need for skilled OSH professionals in a world where working conditions for the majority of the workers do not meet the minimum standards and guidelines. Training programmes in occupational safety and health are fundamental for prevention in the workplace. Increasing the knowledge of workers, OSH professionals, managers and policy makers and enforcers on risk factors, hazards, and the ability to introduce safe work practices can lead to safer and better workplaces. The training of specialists in OSH other than the medical doctors is lacking in most countries. University of Turin and the International Labour Organization (ITC-ILO) decided to develop a state of the art Master Course in OSH aimed at the three main OSH professions (occupational safety, industrial hygiene, occupational medicine) with a university degree but without previous specialization in occupational safety and health. Students had the opportunity to build up personal networks and relationships and enhance analytical and problem solving skills.

The study visits have been a very effective tool to enrich the notions that have been learnt in the classroom. At the end of the training period, participants learnt to manage the use of procedures, techniques, methods and other tools for hazard identification, risk evaluation and risk control, set up a safety and health management system for an enterprise, incorporating fundamental techniques of OSH management, advise employers and workers on OSH technical requirements and finally support the efforts of an enterprise in improving its OSH programme. Further analysis have been planned to evaluate the long-term impact of this Master course.

REFERENCES

Board of the Certified Safety Professionals (BCSP) of the United States, accessible at: <https://www.bcspp.org/>, accessed: 05.01.2018.

Cook, DA., Levinson, AJ., Garside, S., Dupras, DM., Erwin, PJ., Montori, VM.: Internet based learning in the health professions, *JAMA*, 300, 2008, 10, 1181–1196.

ESNER, 2014, accessible at: <https://osha.europa.eu/en/surveys-and-statistics-osh/esener/>, accessed: 09.01.2018

Forst, L., Nickels, L., Conroy, L.: The who modules in occupational safety and health: training for prevention, *Public Health Rep*, 124, 2009, 1, 169–176.

Goldstein, G. et al: *WHO Occupational Health Programme*, 2000, accessible at: http://www.who.int/occupational_health/publications/en/oehafropretoria.pdf, accessed: 05.01.2018.

Jeun, BS., Javan, R., Gay, SB., Olazagasti, JM., Bassignani, MJ.: An inexpensive distance learning solution for delivering high-quality live broadcasts, *Radiographics*, 278, 2008, 1251–1258.

Kempa, V.: *Occupational health services in the EU - mapping the provision*, 2014, accessible at: file:///D:/Desktop/Hesamag_10_EN_p16-17.pdf, accessed: 09.01.2018

Kirkpatrick, DL.: *Evaluating training programs: the four levels*, Berrett-Koehler, San Francisco, 1994.

Masset, HA.: Appropriateness of Hispanic Print Materials: A Content Analysis. *Health Education Research*, 11, 1996, 2, 231–242.

Miller, KT., Hannum, WM., Proffit, WR.: Recorded interactive seminars and follow-up discussions as an effective method for distance learning, *Am J Orthod Dentofacial Orthop*, 139, 2011, 412–416.

O'Connor, T., Flynn, M., Weinstock, D. and Zanoni, J.: Occupational safety and health education and training for underserved populations, *New Solut*, 24, 2014, 1, 83–106.

Recommendation of the second meeting of the WHO Collaborating Centres in Occupational Health, 11-14 October 1994, Beijing, China available at: http://www.who.int/occupational_

[publications/globstrategy/en/index6.html](http://www.who.int/publications/globstrategy/en/index6.html), accessed: 09.01.2018

WHO Global Plan of Action on Workers' Health (2008-2017): Baseline for Implementation, 2013, accessible at: http://www.who.int/occupational_health/who_workers_health_web.pdf?ua=1, accessed: 08.01.2018.

WHO Global Strategy on Occupational Health for All, 1995, accessible at: http://www.who.int/occupational_health/en/oehstrategy.pdf, accessed: 08.01.2018.

WHO, International minimum requirements for health protection in the workplace, 2017, accessible at: <http://apps.who.int/iris/bitstream/10665/259674/1/9789241512602-eng.pdf?ua=1>, accessed: 09.01.2018

Zhang, D.: Interactive multimedia-based e-learning: a study of effectiveness, *Am J Distance Educ*, 19, 2005, 3, 149–162.

RASTUĆE POTREBE U ZAŠTITI NA RADU: MAGISTERIJ IZ ZAŠTITE NA RADU (PROGRAM MEĐUNARODNE ORGANIZACIJE RADA I SVEUČILIŠTA U TORINU)

SAŽETAK: Javne i privatne organizacije diljem svijeta sve se više bave unapređenjem zaštite na radu i u stalnoj su potrazi za obrazovanim stručnjacima. Stručnjakom zaštite na radu postaje se tijekom multidisciplinarnog osposobljavanja. Od 2012. Sveučilište u Torinu u suradnji s Međunarodnim centrom za osposobljavanje pri Međunarodnoj organizaciji rada (ITC-ILO) i Međunarodnoj komisiji za zaštitu na radu (ICOH) odgovorilo je na izazov i otvorilo studij na razini magisterija iz zaštite na radu.

Cilj je utvrditi sustavnost i učinkovitost predloženog obrazovanja. Program je otvoren sudionicima iz razvijenih zemalja i zemalja u razvoju. Pored pripreme obrazovne faze putem interneta kojom sudionici različitih predznanja postižu odgovarajuću razinu znanja, ovaj program uključuje i rezidencijalni dio, na koji se nastavlja još jedno razdoblje učenja na daljinu kao priprema za disertaciju.

Rezidencijalna faza u Torinu sastoji se od rada u učionici, studijskih posjeta odabranim poduzećima i, s tim u vezi, odgovarajućem osposobljavanju.

Između 2007. i 2018. više od 300 sudionika prijavilo se za postdiplomski studij, a zatim za magisterij iz zaštite na radu. Dolazili su iz različitih sredina: javnih institucija, privatnih tvrtki i sveučilišta. Sudionika 65,7 % (SD 8,1%) upisalo je rezidencijalni program, a prosječna im je dob bila 38 godina (SD 7,4), 55,9 % (SD 5,2) završilo je magisterij. Korištene su različite strategije vrednovanja programa. Proječna ocjena zadovoljstva bila je visoka (4,28; SD 0,67).

Na kraju osposobljavanja sudionici su naučili upravljati postupcima i tehnikama zaštite na radu kao i sustavima upravljanja zdravljem. Rezultati upitnika o učinkovitosti programa pokazuju korisnost i zadovoljstvo programom.

Ključne riječi: zaštita na radu, osposobljavanje u zaštiti zdravlja, vezano učenje, zemlje u razvoju, Međunarodna organizacija rada

*Izvorni znanstveni rad
Primljeno: 20.3.2018.
Prihvaćeno: 31.8.2018.*