The integration of safety and health into education

An empirical study of good-practice examples on www.enetosh.net

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DGUV
Deutsche Gesetzliche
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ENETOSH
European Network Education
and Training in Occupational
Safety and Health

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Abstract

The European Network Education and Training in Occupational Safety and Health (ENETOSH) offers a platform for systematic knowledge-sharing on issues concerning education and training in occupational safety and health. The ENETOSH network of OSH and education experts currently has 888 examples of good practice on how to integrate OSH into education and learning processes at different life stages.

This study contributes to 'practical evidence' of the integration of OSH into education and learning processes at four levels of education (pre-school/school, initial vocational education and training, higher education, and continuing vocational education and training). The study facilitates access to good practice examples, identifies good models and recommends future action for practitioners, disseminators and decision makers.

From the original 756 examples of good practice in the ENETOSH database, a representative sample of studies was chosen for each level of education. Based on the settings approach of the World Health Organisation (WHO) and its key elements of participation, empowerment, sustainability and networking, a classification system was developed where the selected examples were categorised and weighted. Eighty-three examples of good practice were analysed in detail. A list of keywords was compiled for use in further analysis.

Three significant correlations with other categories were found for the key elements of networking, participation and sustainability, thus making them the most strongly correlated. The keyword analysis showed that over half of the examples mentioned 'safety' and 40 percent referred to 'school'. References to empowerment and sustainability could be found in most of the examples. More than half of the examples referred to networking and at least a quarter to participation.

The correlation between networking, participation and sustainability with other elements make them possible 'markers' for the integration of safety and health into education and training.

The results of the study were also used to identify eight good-practice models and three trends for integrating safety and health into education.

Kurzfassung

Das Europäische Netzwerk Aus- und Weiterbildung in Sicherheit und Gesundheit bei der Arbeit (ENETOSH) bietet eine Plattform für den systematischen Erfahrungsaustausch zu Fragen der Aus- und Weiterbildung in Sicherheit und Gesundheit. Das ENETOSH-Netzwerk der Arbeitsschutz- und Bildungsexperten verfügt aktuell über 888 Beispiele guter Praxis der Integration von Sicherheit und Gesundheit in Bildungs- und Lernprozesse in unterschiedlichen Lebensphasen.

Diese Studie leistet einen Beitrag zur „praktischen Evidenz" der Integration von Sicherheit und Gesundheit in Bildungs- und Lernprozesse auf den verschiedenen Ebenen des Bildungssystems (Kindertagesstätte/Schule, Berufliche Erstausbildung, Hochschulbildung und Berufliche Aus- und Weiterbildung). Die Studie erleichtert den Zugang zu den Beispielen guter Praxis, identifiziert gute Modelle und gibt Empfehlungen für zukünftige Maßnahmen von Praktikern, Multiplikatoren und Entscheidungsträgern.

Von den zum Projektstart in der ENETOSH-Datenbank vorhandenen 756 Beispielen guter Praxis wurde eine repräsentative Stichprobe für jede Bildungsebene gezogen. Auf der Grundlage des Setting-Ansatzes der Weltgesundheitsorganisation (WHO) und dessen Schlüsselelementen Partizipation, Befähigung, Nachhaltigkeit und Netzwerken wurde ein Kategoriensystem entwickelt; die Beispiele aus der Stichprobe wurden zugeordnet und gewichtet. 83 Beispiele guter Praxis wurden im Detail analysiert. Für weitere Analysen wurde eine Stichwortliste erstellt.

Für die Schlüsselelemente Netzwerken, Partizipation und Nachhaltigkeit konnten drei signifikante Korrelationen mit anderen Elementen nachgewiesen werden; zwischen ihnen gab es den stärksten Zusammenhang. Die Stichwortanalyse zeigte, dass in mehr als der Hälfte der Beispiele „Sicherheit" erwähnt wurde und 40 Prozent der Beispiele sich auf „Schule" bezogen. Hinweise auf Befähigung und Nachhaltigkeit konnten in den meisten Beispielen gefunden werden, mehr als die Hälfte der Beispiele bezogen sich auf Netzwerken und immerhin noch ein gutes Viertel auf Partizipation.

Die Korrelation von Netzwerken, Partizipation und Nachhaltigkeit mit anderen Elementen macht sie zu möglichen „Markern" für eine Integration von Sicherheit und Gesundheit in die Aus- und Weiterbildung.

Auf der Grundlage der Studie konnten darüber hinaus acht gute Modelle für die Praxis identifiziert und drei Trends für die Zukunft der Integration von Sicherheit und Gesundheit in Bildung formuliert werden.

Résumé

Le Réseau européen pour l'éducation et la formation à la sécurité et à la santé au travail ENETOSH offre une plateforme permettant un échange systématique d'expérience sur les questions relatives à l'éducation et à la formation à la sécurité et à la santé. Réunissant des experts de la sécurité et de la santé au travail et de l'éducation, le réseau ENETOSH dispose actuellement de 888 exemples de bonne pratique sur l'intégration des enjeux de la sécurité et de la santé dans les processus d'éducation et d'apprentissage à différentes étapes de la vie.

Cette étude contribue à montrer comment s'effectue dans la pratique l'intégration des enjeux de la sécurité et de la santé dans les processus d'éducation et d'apprentissage aux différents niveaux du système éducatif (éducation préscolaire/scolaire, formation professionnelle initiale, enseignement supérieur et éducation et formation dans le milieu professionnel). L'étude facilite l'accès aux exemples de bonne pratique, identifie les bons modèles et donne des conseils pour l'action future des praticiens, des multiplicateurs et des décideurs.

Parmi les 756 exemples de bonne pratique que contenait la base de données ENETOSH au début du projet, un échantillon représentatif a été tiré pour chaque niveau d'enseignement. Sur la base de l'approche en fonction du milieu de l'Organisation mondiale de la Santé (OMS) et des éléments-clés qu'en sont la participation, la qualification, la durabilité et les réseaux, un système de catégories a été élaboré, selon lequel les exemples tirés de l'échantillon ont été classifiés et pondérés. 83 exemples de bonne pratique ont été analysés en détail. Une liste de mots-clés a été dressée pour des analyses plus approfondies.

Pour les éléments-clés que sont les réseaux, la participation et la durabilité, trois corrélations significatives avec d'autres éléments ont pu être démontrées; c'est entre eux que la corrélation était la plus forte. Il est ressorti de l'analyse des mots-clés que la «sécurité» était mentionnée dans plus de la moitié des exemples, et que 40% des exemples concernaient «l'école». Des références à la qualification et à la durabilité pouvaient être trouvées dans la plupart des exemples, plus de la moitié des exemples se rapportaient à des réseaux, et pas moins d'un bon quart à la participation.

La corrélation des réseaux, de la participation et de la durabilité avec d'autres éléments fait d'eux des «marqueurs» possibles pour une intégration de la sécurité et de la santé dans l'éducation et la formation.

Sur la base de l'étude, on a pu en outre identifier huit bons modèles pour la pratique, et formuler trois tendances pour l'avenir de l'intégration des enjeux de la sécurité et de la santé dans le système éducatif.

Resumen

La Red Europea de Educación y Formación sobre Seguridad y Salud en el Trabajo ENE-TOSH ofrece una plataforma para el intercambio sistemático de experiencias sobre cuestiones relativas a la educación y la formación en materia de seguridad y salud. La red ENETOSH de expertos en educación y en prevención de riesgos laborales dispone actualmente de más de 888 ejemplos de buenas prácticas de integración de la seguridad y la salud en procesos de formación y aprendizaje en diferentes fases de la vida.

Este estudio contribuye a la "evidencia práctica" de la integración de la seguridad y la salud en procesos de formación y aprendizaje en las diferentes etapas del sistema educativo (formación preescolar, primaria y secundaria, formación profesional inicial, educación superior y formación profesional continua). El estudio facilita el acceso a los ejemplos de buenas prácticas, identifica buenos modelos y aporta recomendaciones de medidas futuras para profesionales, multiplicadores y responsables de la toma de decisiones.

De los 756 ejemplos de buenas prácticas existentes en la base de datos de ENETOSH al principio del proyecto se ha tomado una muestra aleatoria representativa para cada etapa de formación. Sobre la base del enfoque situacional de la Organización Mundial de la Salud (OMS) y de sus elementos clave participación, empoderamiento, sostenibilidad y redes, se ha desarrollado un sistema de categorías con el que se clasifican y ponderan los ejemplos de muestra. Se han analizado en detalle 83 ejemplos de buenas prácticas y se ha elaborado una lista de palabras clave para facilitar otros análisis.

Para los elementos clave redes, participación y sostenibilidad se han podido demostrar tres correlaciones significativas con otros elementos; entre ellos existía la mayor interrelación. El análisis de palabras clave ha mostrado que en más de la mitad de los ejemplos se mencionaba la "seguridad" y que el 40 por ciento de los ejemplos se referían a la "escuela". En la mayoría de los ejemplos se han podido encontrar referencias al empoderamiento y a la sostenibilidad, más de la mitad de los ejemplos se referían a redes y un nada despreciable algo más de un cuarto se referían a la participación.

La correlación entre redes, participación y sostenibilidad con otros elementos los convierte en posibles "marcadores" para una integración de la seguridad y la salud en la educación y la formación.

Adicionalmente, sobre la base del estudio se han podido identificar ocho buenos modelos para la práctica y se han podido formular tres tendencias para el futuro de la integración de la seguridad y la salud en la educación.

Authors' note

Content

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1 Overview and background

This study contributes to 'practical evidence' of the integration of occupational safety and health (OSH) into education and training at four levels of the education system (pre-school/school, initial vocational education and training, higher education, and continuing vocational education and training). The study facilitates access to good practice examples, identifies good models and recommends future action for practitioners, disseminators and policy makers.[1]

1.1 Mainstreaming OSH into education

Start young, stay safe

The initiative for 'Mainstreaming OSH into Education' was launched in 2002 at the seminar 'Learning about Occupational Safety and Health' by the European Agency for Safety and Health (EU-OSHA) together with the Spanish EU Presidency and in cooperation with the European Commission. This seminar opened the discussion about mainstreaming OSH into education at European level. The main conclusion of the seminar – 'to start safety and health awareness-raising and education from an early age onwards' – was included in the final version of the Community Strategy on Health and Safety at Work for 2002–2006. An initial strategic approach to mainstreaming OSH into education was made by the 'Rome Declaration on mainstreaming OSH into education and training' announced by the Italian EU Presidency in

2003. In 2004, EU-OSHA published its first report on 'Mainstreaming occupational safety and health into education – Good practice in school and vocational education' (Bollmann 2004). Mainstreaming OSH into education was a permanent item on EU-OSHA's agenda until 2013. Five reports, one working paper and many factsheets were published. In 2006, the 'Safe start – Young workers' campaign was launched.

Following the start of mainstreaming OSH into education by EU-OSHA in 2002, there were discussions on the need for a platform where OSH and education experts could meet, exchange experiences and learn from each other. An agency contact group 'Mainstreaming occupational safety and health into education and training' was set up in 2003, composed of OSH and education experts. The group consisted of representatives from the EU Member States, the EFTA States, the Employment and Social Affairs Directorate-General, the Education and Culture Directorate-General and representatives nominated by the social partners.

These activities were the springboard for an application to receive funding for a project in 2004 at the National Agency for Education in Europe by the Institute for Work and Health (IAG) of the German Social Accident Insurance (DGUV) to establish the European Network Education and Training in Occupational Safety and Health (ENETOSH).

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1   In the following, the abbreviation 'Mainstreaming OSH into education' will be used for all four levels of the education system.

The European Network Education and Training in Occupational Safety and Health (ENETOSH)

The fundamental aim of ENETOSH is to mainstream OSH into education. The assumption is that mainstreaming OSH into education will help boost the overall quality of education and prepares the foundation for the development of a culture of prevention.

ENETOSH offers a platform for systematic knowledge-sharing on issues concerning education and training in occupational safety and health.

The network was set up with the financial support of the European Commission as part of the LEONARDO DA VINCI programme (for a project phase from Oct 2005 to Sep 2007: 2005-146 253). The project started out with 13 partners from 10 countries. In October 2009, ENETOSH was awarded the 'LEONARDO Award Innovation in Practice', by the National Agency for Education in Europe, based at Germany's Federal Institute for Vocational Education and Training (BIBB), for outstanding EU projects that produce inspiring results and effects on education and training in practice. In 2015, ENETOSH celebrated its 10th birthday at EU-OSHA in Bilbao.

Today, 88 members from 37 countries worldwide are involved in ENETOSH. The network is coordinated by the Institute for Work

and Health of the DGUV. During the project phase, ENETOSH was supported by an advisory board, consisting of representatives of leading European and national institutions. In 2012, a steering committee was established to provide guidance on key issues such as the strategic approach, common projects and events. The steering committee consists of representatives of the network including the (European) social partners.

At European and international level, ENETOSH collaborates with other networks such as the National Focal Point network of EU-OSHA, the European Network for Safety and Health Professional Organisations (ENSHPO) and the Robert W. Campbell Award Global Network of the US National Safety Council (NSC).

The idea that safety and health are an integral part of all phases of life guides the work of ENETOSH, which is why it covers all areas of education, from pre-school to school, initial vocational education and training, higher education through to continuing vocational education and training.

The ENETOSH network of OSH and education experts currently has in its database 888 examples of good practice from 50 countries on how to mainstream OSH into education and learning at different life stages.[2] This collection is rich in data and deserves to be mined and packaged so that practitioners, disseminators and policy-makers can make full use of it.

1.2 The interest and scope of the study

The study was conducted in response to a request made by the International Labour Organisation (ILO) to systematically analyse ENETOSH's wealth of experience in order to make empirical statements on promising models and trends for integrating safety and health into education. This request was made within the scope of the Global Action for Prevention on Occupational Safety and Health (OSH GAP) programme to clarify if and how ENETOSH could contribute to the OSH GAP flagship programme 'SafeYouth@ Work'.[3]

The objectives of the study were defined during a meeting between the project leader of 'SafeYouth@Work', the coordinator of the Occupational Safety and Health Network, Knowledge & Information Management at ILO and members of the ENETOSH network on 10 July 2015 at the British Safety Council in London. The objectives are:

1. Systematically analyse the wealth of experience within the ENETOSH database
2. Facilitate and improve access to good practice examples in the database
3. Identify good models for the integration of safety and health into education
4. Determine trends
5. Support the international transmission of this experience

The aim of the study was to systematically analyse the data and not to re-evaluate a few examples of good practices. Collecting good practice examples and including them in the ENETOSH database is based on 10 criteria, of which at least five must be met.[4] In addition, the inclusion of new examples undergoes a continuous quality assurance process via quarterly feedback from the editor of the ENETOSH Internet Platform to the ENETOSH editorial committee.

The intention of the analysis is to describe the starting points for implementing good practice models into a practice of good models (Peter Paulus), to contribute to the 'practical evidence' of the projects, and to identify what needs to be done to integrate safety and health into different levels of education.

The study is targeted at people responsible for the development of educational programs, heads of educational establishments, teachers and trainers, and politicians in the field of OSH and education. The ENETOSH network itself can benefit from this study because it contributes to practice-based evidence; EU-OSHA can benefit from being able to use this evidence base to give a mainstreaming element to future EU-OSHA campaigns on topics such as dangerous substances and musculoskeletal disorders.

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2   Figures correct as of 24 March 2018

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3   For more information about OSH GAP visit: http://www.ilo.org/global/about-the-ilo/how-the-ilo-works/ WCMS_495278/lang--de/index.htm ENETOSH especially contributed to 'SafeYouth@Work' related to the Safe-Youth@Work Congress in parallel with the 2017 World Congress on Safety and Health at Work in Singapore.
4   Criteria for including examples of good practice in the ENETOSH database: refers to a standard, stakeholder involvement, refers to learning at all stages of life, refers to the working and learning environment, train the trainer measures, interactive and flexible methods, refers to the world of work, defines entry requirements, certificate of completion, evaluation or feedback: http://enetosh.net/webcom/show_article.php/_c-50/_nr-1/i.html

The ILO are in the process of developing global and country-specific strategies to promote OSH among young people based on the SafeYouth@Work Project and are keen to use this information to help them target effective activities under their OSH GAP programme.

1.3   Theory framework

1.3.1   Settings approach

The settings approach has its roots in the WHO 'Health for All' strategy, specifically the Ottawa Charter for Health Promotion (WHO 1986). The settings approach focuses on people's living environments which are the framework conditions under which people live, learn, work and consume. It is a response to the limited success of traditional health education activities which target individuals with information.[5]

It is important to note that work in a setting can be done in two different ways: (1) Setting-based prevention utilises access to target groups for behavioural-based prevention measures (e.g. exercise or stress management programmes). Interventions range from targeting specific groups with information through to participative programmes in the setting. (2) In contrast, projects for creating health-promoting settings focus on the person's participation in the setting and a process of systematic organisational development. The aim is to bring about changes that improve the well-being and health of the people participating (Rosenbrock/Hartung 2011).

One of the first programmes to follow the settings approach was the Healthy City programme (1990), followed by Healthy Hospital (1991), Regions for Health in Europe (1992), Workplace Health Promotion (1997) and in the same year Health Promoting School (1997) followed by Health Promoting Universities (1998).

In the field of education, there are two different perspectives regarding the settings approach. At the end of the 1980s and the beginning of the 1990s, there was a shift away from traditional risk-oriented health education with its didactic approach to deterrence. Health promotion in schools is now focused on health resources, the salutogenic factors as coined by Aaron Antonovsky (1997): 'This is a comprehensive approach that views health holistically as a physical, mental, social, ecological and spiritual occurrence, which not only targets the behaviour of the people involved in the school, that is, students, teachers and non-teaching personnel, but also takes into consideration the conditions of the school, the physical structures and buildings, as well as the organisational structures and processes that make up school life and school culture' (Paulus 2010). We are talking here of a holistic approach to health-promoting school settings: safety and health should be promoted through education.

However, around the turn of the millennium, the school setting changed radically, not least because of the influence of the Trends in International Mathematics and Science Study (TIMSS, since 1995) and the Programme

for International Student Assessment (PISA, since 2000). A 'new perspective is developing that emanates from the quality dimensions of education in schools and which asks about the contribution that health-promoting schools can make to school quality and consequently to the [safe and] healthy design of school as a workplace.' The perspective now is on 'health as a contributor to the development of school quality'. The motto is 'Using health to make good schools' (Paulus 2010). Now, it is more a case of promoting education through safety and health, rather than promoting safety and health through education.

Further challenges arise especially from: creating and expanding an inclusive education system based on the UN Convention on the Rights of Persons with Disabilities; the wide range of different school types (from 'learning school' through to 'problem schools without hope'); taking into consideration different social milieus; the demands of an evaluation which encompasses the complexity of a 'good, healthy school'; the lack of a systematic inventory of existing measures to promote safety and health in the school, and not disseminating them or making them permanently a part of school life (Dadaczynski et al. 2015).

Recently, there have also been questions raised about the concept of education through safety and health, such as whether management strategies can be applied to education and whether safety and health are pedagogical categories (Suter 2017; cf. the different definitions of the whole-school approach by EU-OSHA and ENETOSH).

1.3.2   Culture of prevention

The concept of a culture of prevention goes back to the European Community Strategy on Health and Safety at Work (2002-2006). The call for a culture of prevention at national level across the globe came in 2008 at the XVII World Congress on Safety and Health at Work in Seoul, Republic of Korea. Since then, the concept has been promoted and driven forward at international and national level. The concept of a culture of prevention goes beyond the classic approach to prevention which focuses solely on risks. It not only involves the prevention of work-related accidents and diseases, but also promotes a complete physical mental and social well-being in the workplace. The impetus for this holistic understanding of prevention was, once again, WHO's Ottawa Charter.

Given how globalisation and digitalisation is rapidly changing and disrupting the way we live and work, traditional rule-based and mechanistic approaches to safety and health are no longer enough. In addition, there are new demands being placed on the competences of all involved, such as flexibility, mindfulness, and willingness to take risks and make decisions (Bollmann 2018; Bollmann/Boustras in preparation).

The concept of a culture of prevention not only draws attention to technical standards, accident prevention regulations, the OSH management system (Level 1. Procedure), guidelines and company values (Level 2. Procedure), it also concerns itself with how safety and health in companies or educational institutions are lived (Level 3. Proce-

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5   The focus of this report is on safety and health within the setting of education and work.

dure). This means that the focus is on existing patterns of dealing with safety and health (e.g. discrepancies between what is said and what is actually done; ambiguous or conflicting messages) and differences in the importance of safety and health for different groups of people in an organisation (e.g. management, supervisors, teachers, students, parents, school caretakers).

The foundations for safety and health becoming a self-evident, 'lived' part of our

professional and private lives are laid down in early childhood education, school, initial vocational training and higher education.

From an OSH perspective, safety and health are priorities for the individual at all stages of life and are an integral part of planning and decision-making processes as well as activities in educational institutions and companies.

2 Methods

2.1 Sample

At the start of the project in February 2016, the ENETOSH database contained 756 good practice examples. The sample used for the study included 53 percent of the examples (N=404). Care was taken to ensure that the sample reflected the distribution of examples across the different levels of the education system. The sample is only representative of the data in the ENETOSH database. Complementary qualitative and quantitative methods were used for the study.

2.2 Content analysis

The project team developed a classification system for the analysis of the good practice examples in the ENETOSH database. This system is based on the settings approach and its key elements of success: participation, empowerment, sustainability, networking. Indicators were defined for each key element with a rating scale of 1-3 to reflect the strength of each key element. '0' meant there was 'no information'. The four key elements of the settings approach were supple-
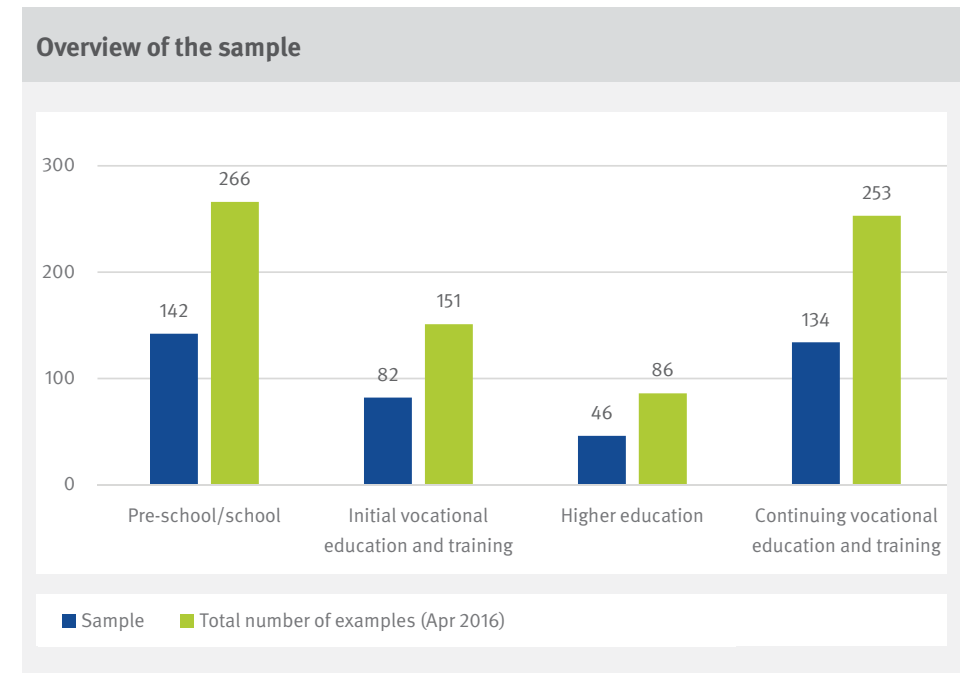

Overview of the sample

Figure 1: Overview population and sample

mented with the following elements: focus on target group; evaluation; prevention approach; policy focus; level of aggregation and type of intervention; and type of activity and methods. Of the additional elements, it only made sense to rate focus on target group, evaluation and prevention approach. (See Chapter 6.1 Annex I – Classification system)

A pre-test of the classification system was conducted using a random sample from the ENETOSH database. Independently of each other, the members of the project team assessed a random sample of individual examples according to the classification system. The results were then compared. Differences in the assessments were discussed and, where necessary, adjustments were made to the classification system.

All 404 examples of good practice were assessed on the basis of the classification system and the information stored in the ENETOSH database. Each individual example in the sample was ranked on a scale of 1-3 for all elements in the classification system. The examples came from 18 EU-27 countries (Austria, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Latvia, Lithuania, Macedonia, Malta, The Netherlands, Portugal, Romania, Spain, Sweden) as well as from Canada, Singapore, Switzerland, Turkey and the USA.

For the qualitative evaluation, text anchors were marked in the descriptions of the ex-

amples of good practice from the ENETOSH database, and further information on the examples was researched on the internet. Each project was searched for online to establish whether it had an internet presence.

2.3 Correlation analysis

A correlation analysis was performed to find out if there was a relationship between the various (key) elements. The analysis was based on the mapping of examples of good practice to the four key elements of the settings approach and the additional elements.

2.4 Focus group

The examples that were scored Level 2 or Level 3 for two or more key elements provided the basis for a focus group which took place in Istanbul in May 2016. The focus group included 11 people from eight countries (Austria, Czech Republic, Egypt, Germany, Italy, Singapore, Spain, UK). A total of 20 examples of good practice were scrutinised intensively by the focus group. The assessments were done in small groups based on each level of education. The criteria for the assessment were: relevance, clarity, sustainability, diversity, collaborative approach, effective participation and involvement, transferability, currency, and legality.[6] The experts in the focus group selected 11 examples from the available data. The focus group gave feedback on the previous approach to content analysis and recommended that a keyword list be created.

2.5 Keyword list

A keyword list was created which was based on the examples ranked 3 for at least one key element. The keywords were selected per level of education and approved by an expert from the ENETOSH editorial committee. In total, there were 535 keywords on the list. These keywords were then used to do a search on all 404 examples. The analysis showed which keywords were most prevalent and whether there were differences in the frequencies for each key element.

2.6 Narrative interviews

Each project leader was sent an email requesting a telephone interview related to the 11 good-practice examples selected by the focus group. Interview guidelines were developed by the project team for each key element of the settings approach (see Chapter 6.2 Annex II – Interview guideline). The interviews focused on first-hand information about each example and on experience-based feedback and a deeper understanding of the key elements to which the example was assigned. A total of nine interviews took place between April and July 2017. A written record was made for each interview.

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6   The criteria were provided to the focus group by a representative from EU-OSHA: https://osha.europa.eu/en

3 Results

3.1 Statistical analysis

The number of projects with at least one key element at level 3 was relatively constant across all levels of education. It was highest in the fields of 'continuing vocational education and training' (26%), 'pre-school/school' (26%), and 'higher education' (26%). Level 3 key elements were marginally less common in 'initial vocational education and training' at 22 percent (see Figure 2).

Examples of Level 3 empowerment could be found in the largest number of projects (35),

closely followed by sustainability at 30 projects. The key elements participation and networking were placed in the middle at 19 and 18 projects respectively.

Networking, participation and sustainability had the strongest correlations with other categories; each showing three significant correlations. Evaluation and focus on target group showed significant correlations with only two other categories, whereas empowerment correlated exclusively with participation.

Good-practice examples ranked at Level 3
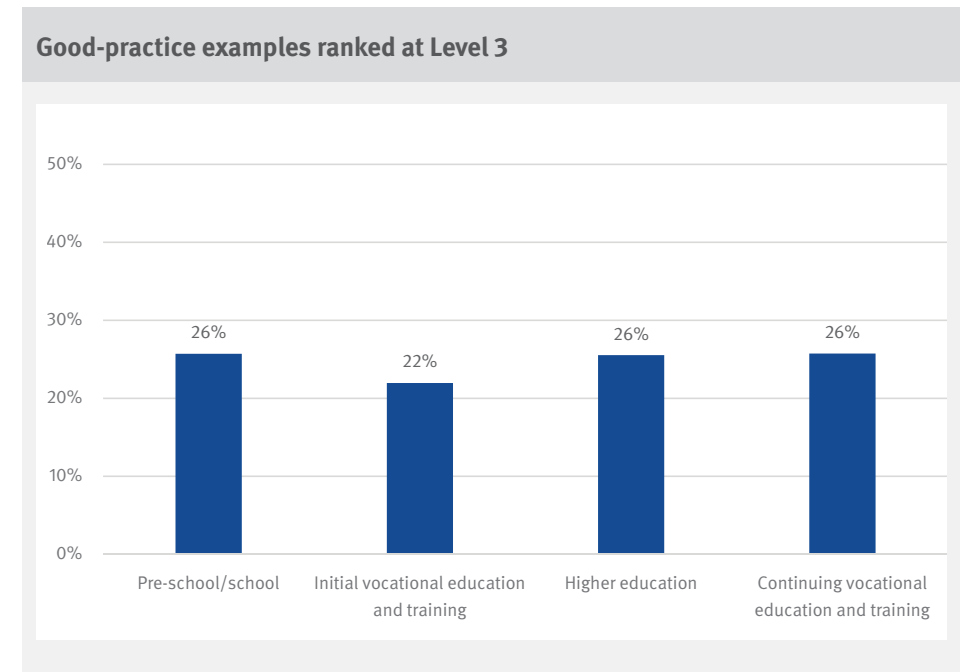
Figure 2: Percentage of examples with at least one key element at Level 3 (n = 102)

All correlations were between r = .21 and r = .31 (see Figure 3).

A keyword analysis was carried out for the entire sample and also for each key element and additional element, then compared with the frequency in the entire sample.

The keyword 'safety' was found in over half of all examples (57%). 'School' could be found in 40 percent of examples and 'student' in 30 percent. 'Teacher' was mentioned in 26 percent of cases and the words 'prevention', 'age', 'information', 'accident', 'environment' and 'learning' were mentioned in around one fifth of examples (see Figure 4).

The results of the keyword analysis for each element can be found in the respective sub-chapters of the statistical evaluation.

The following sections 3.2 to 3.5 deal with the analysis of good practice examples from the ENETOSH database, based on the key elements of participation, empowerment, sustainability and networking. The chapters include a systematic description of the key element, the statistical analysis of the examples assigned to each key element, an overview of the examples for each key element, and models derived from the material putting the core element into good practice.

Correlation of elements

Figure 3: Correlation of elements at Level 3 (* significant correlation)

Frequency of keywords

Figure 4: Relative frequency of keywords

3.2 Participation as a key element in OSH education

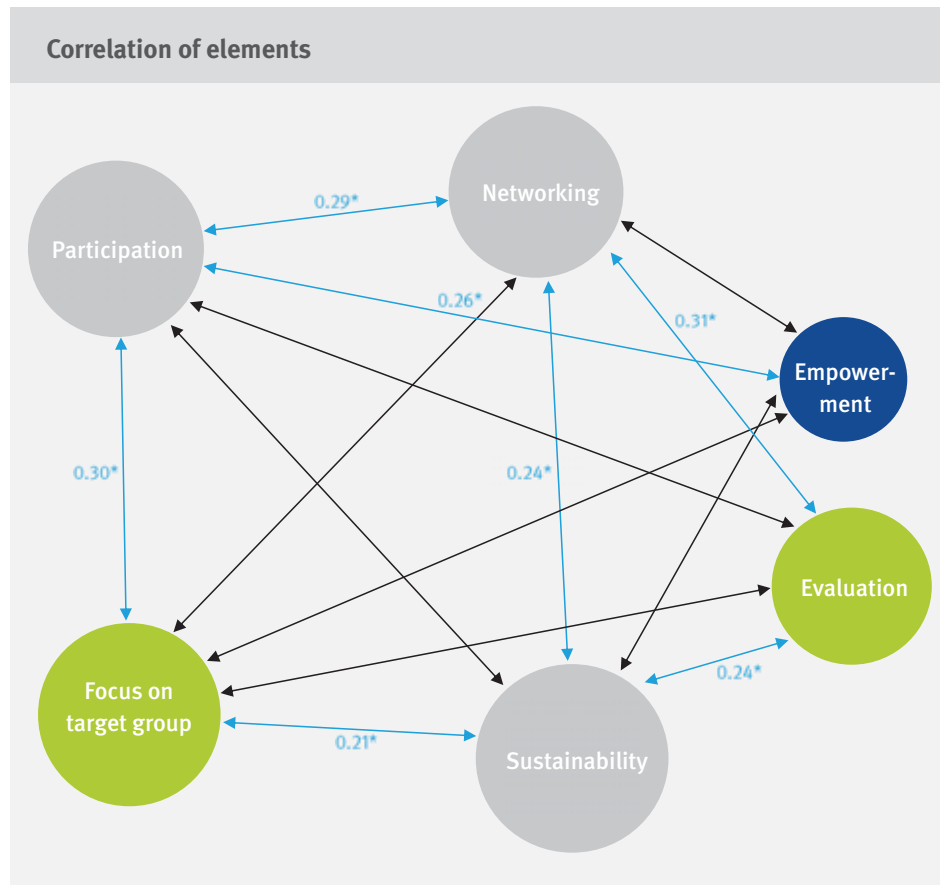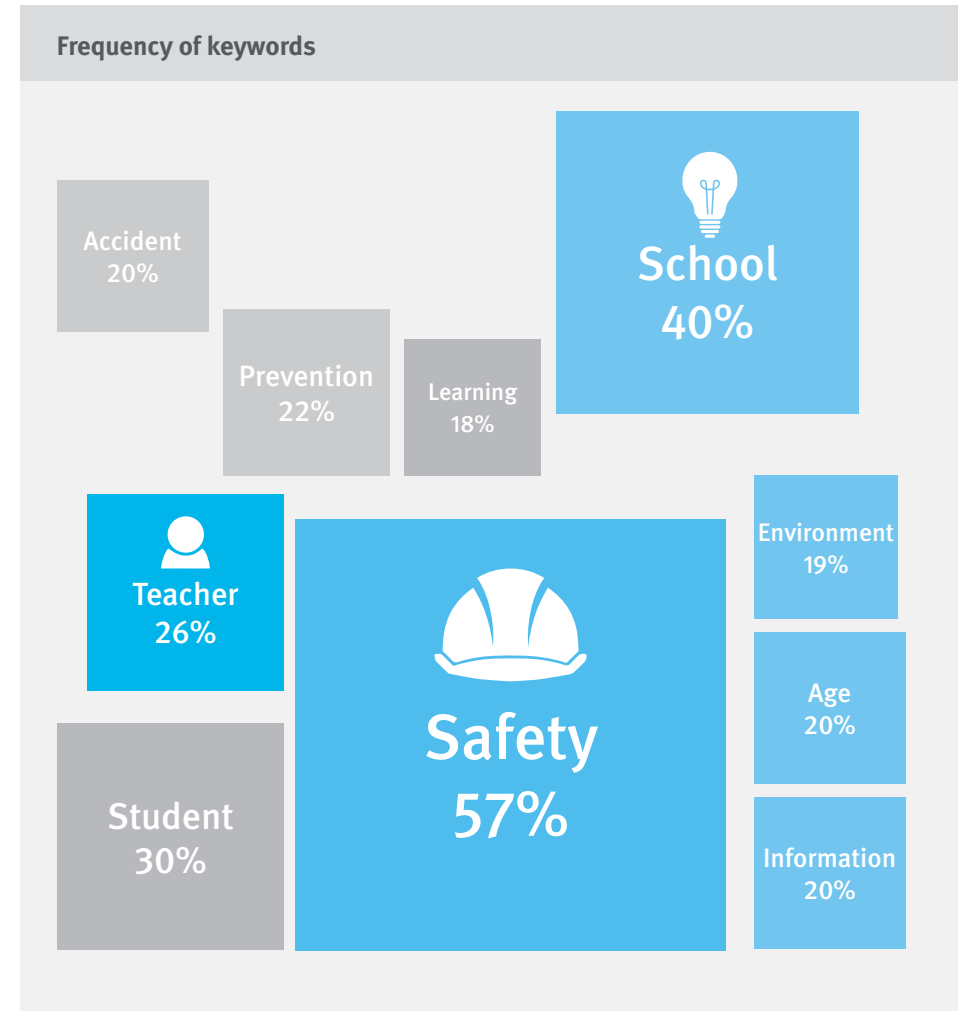### 3.2.1 Meaning of participation

Participation in the following context means including people in development and decision-making processes that affect OSH issues within an organisation and its social environment at the earliest possible stage and across all phases of life.

History of participation

The first examples of participatory pedagogy date back to early modern times and the progressive education movement at the beginning of the 20th century (Wedekind/Schmitz 2007). The 21st century is considered the 'age of participation' (Klatt 2012). In addition to formal opportunities for participation, there has been greater engagement by civil society, which is strongly influenced by informal and individual forms of participation. This is also seen at international level, with the legal right to participate for children and adolescents and disabled people clearly formulated through the adoption of the Convention on the Rights of the Child (UN 1989) and the Convention on the Rights of Persons with Disabilities (UN 2006). Under international law, countries which have ratified the Conventions are legally bound to follow them and can be penalised for violations. The Convention on the Rights of the Child includes the right to health services and social security (Articles 24 and 26). The UN Convention on the Rights of Persons with Disabilities includes the right to work on an equal basis and the right to access social security benefits and programmes without discrimination (Articles 27 and 28).

Increasing demands placed on flexibility and mobility as a result of a globally connected society are also fuelling discussions on participation (Kardoff 2014). How to deal with the opportunities and risks of new forms of informal participation via social media (eParticipation) is still in its infancy.

A close correlation between participation and empowerment has been shown both in political science and safety research (Klatt 2012; Martínez-Córcoles et al. 2012). This is consistent with the results of the correlation analysis conducted in this study (see Section 3.1).

Prerequisites for participation

Participation requires specific individual skills as well as the motivation to take part in measures to improve safety and health. Of central importance here is Albert Bandura's concept of self-efficacy (1997): believing in yourself and your capacity to make a difference with your own actions.

In addition, participation requires knowledge about safety and health at work. Equally important is a participatory work or school environment, as well as the personal commitment of the management in a company or educational institution to self-organised learning and working. In principle, participation is voluntary and is associated with civic engagement, proactive behaviour and commitment. (Martínez-Córcoles et al. 2012)

However, in terms of the prerequisites for participation, one can speak of an 'activation paradox'. Participation presupposes the ability *and* the desire to participate (Kardoff 2014).

Characteristics of participation

Three key dimensions of participation are found in the literature and these were incorporated into the classification system for analysing the examples of good practice in the ENETOSH database: (1) to encourage learning in a team; (2) to include everyone; (3) to participate in decisions ('true participation').

1. Learning in a team means that participation in safety and health 'is strongly embedded in a team-learning process, where team members collaboratively learn from each other'. This is about 'shared and co-constructed knowledge about OSH'. In addition, learning in a team should encourage participative behaviour in occupational safety and health (Martínez-Córcoles et al. 2012).
2. Including everyone means making it easy for people to join in (and developing fewer measures targeted at specific groups). Participation is committed to dialogue and communication. It is about understanding and negotiating, as has been shown through the example of violence prevention in educational institutions and social service facilities. (Grossart et al. 2012) In addition, involving everyone means stakeholders working together across the boundaries of different social areas such as education, social work, health and the economy. In the context of involving everyone, disengagement is also a 'genuine and active style of participation' (Talò/Mannarini 2014). What happens to those who want to make use of their freedom to not participate?

3. True participation means 'shared responsibility'. Participation is not an end in itself. There must be visible, concrete goals. Experiencing self-efficacy requires real, meaningful events. In addition, children's understanding of participation is different to that of adults (Vockerodt 2014; Fatke/Schneider 2005). In this context, one also speaks of the intrinsic 'proxy paradox' of participation: adults know what is best for children; children mimic adult forms of participation (Kardoff 2014). Participation assumes that adults actively share in the lives and perspectives of children (for example, their experiences with different media) and that children and adults, the disabled and non-disabled can learn from one another.

All of this requires a learning and working environment that is designed to allow participation. There must be opportunities to participate, as well as teachers and trainers who can take a step back and assume the role of process and project facilitator.

The downsides of participation should also be mentioned. Firstly, participation alone does not contribute to a reduction in social inequality. Secondly, participation can be 'misused' in real-life situations (for example in schools or pre-schools) as a disciplinary measure or an educational practice that disempowers and is thus used for social control. Thirdly, understanding participation as simply 'joining in' can aggravate dissatisfaction with existing institutions and thus jeopardise democracy (Klatt 2012; Suter 2017).

Finally, participation could result in overload if everyone were to participate everywhere. Participation requires clear structures and needs to be guided, especially with children and adolescents. Often, responsibility is fobbed off but without empowerment being present (Paulus see chapter 3.3.4).

According to a study by the Bertelsmann Stiftung, there is still a lack of participation by children and adolescents, at least in Germany (Fatke/Schneider 2005). This finding is confirmed in the present study with regard to the role of participation in education and training in safety and health.

3.2.2 Statistical analysis of the key element *participation*

Description	Rating
Participation means including people in the development and decision-making processes that affect OSH issues within an organisation and its social environment at the earliest possible stage and across all phases of life.	0: No information 1: Teamwork of all participants 2: Different groups of people are involved in the process 3: People actively participate in overall planning, implementation and the decision-making process

Using the classification system, 117 examples of good practice from the ENETOSH database could be assigned to the key element *participation*. The examples were then rated on a scale of 1-3 for *participation*.

Information regarding participation could be found in 27 percent of all examples of good practice. Examples in the field of 'higher education' contained the least amount of information on participation (17%), whereas participation was most commonly mentioned in the field of 'pre-school/school' (37%).

In just over a third of cases in which participation was mentioned, teamwork of all participants (Level 1) was the main focus. Level 1 *participation* represented the largest portion

of overall participation found in the field of 'continuing vocational education and training'.

Level 2 *participation* (different groups of people are involved in the process) was by far the most common form of participation in the fields 'pre-school/school' (53%); 'initial vocational training' (59%) and 'higher education' (75%).

Active participation in overall planning, implementation and decision-making (Level 3) was the least common form of participation (16%). Noticeably, there were more cases of Level 3 *participation* than Level 2 in the field of 'continuing vocational education and training' (see Figure 5).

The keywords 'school' and 'safety' were found in over half of the examples (59%) that were rated as Level 1 to 3 for the key element participation. The keywords 'student' (39%) and 'teacher' (38%) were also frequently found. Less common were the keywords 'development' (24%), 'management' (23%) and 'company' (22%). It is noteworthy that

almost all keywords were more prominent in these examples than on average across all key elements. There was a particularly large difference concerning the keyword 'school', which was found in 59 percent of examples in this category but only in 40 percent of examples averaged across all categories (see Figure 6).
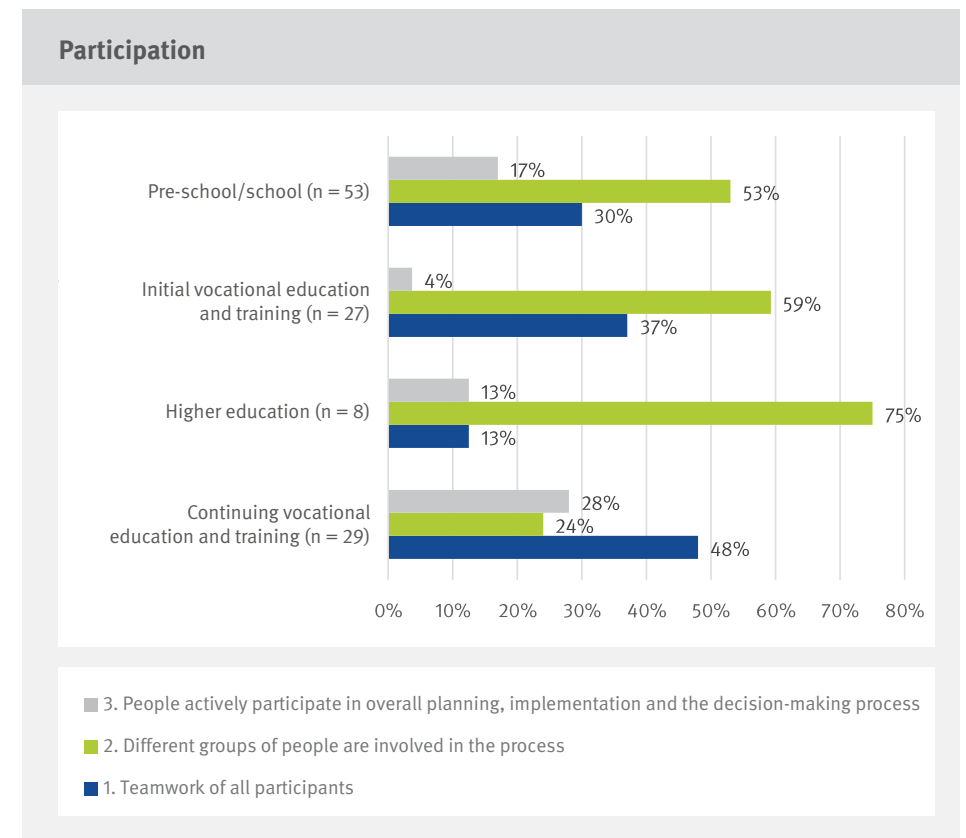

Figure 5: Prevalence of participation at each level of education

In the keyword analysis of the key element participation, it is not only interesting to see which keywords occurred the most, but also which keywords were ranked at the lower end of the Top 10, namely development, management and company.
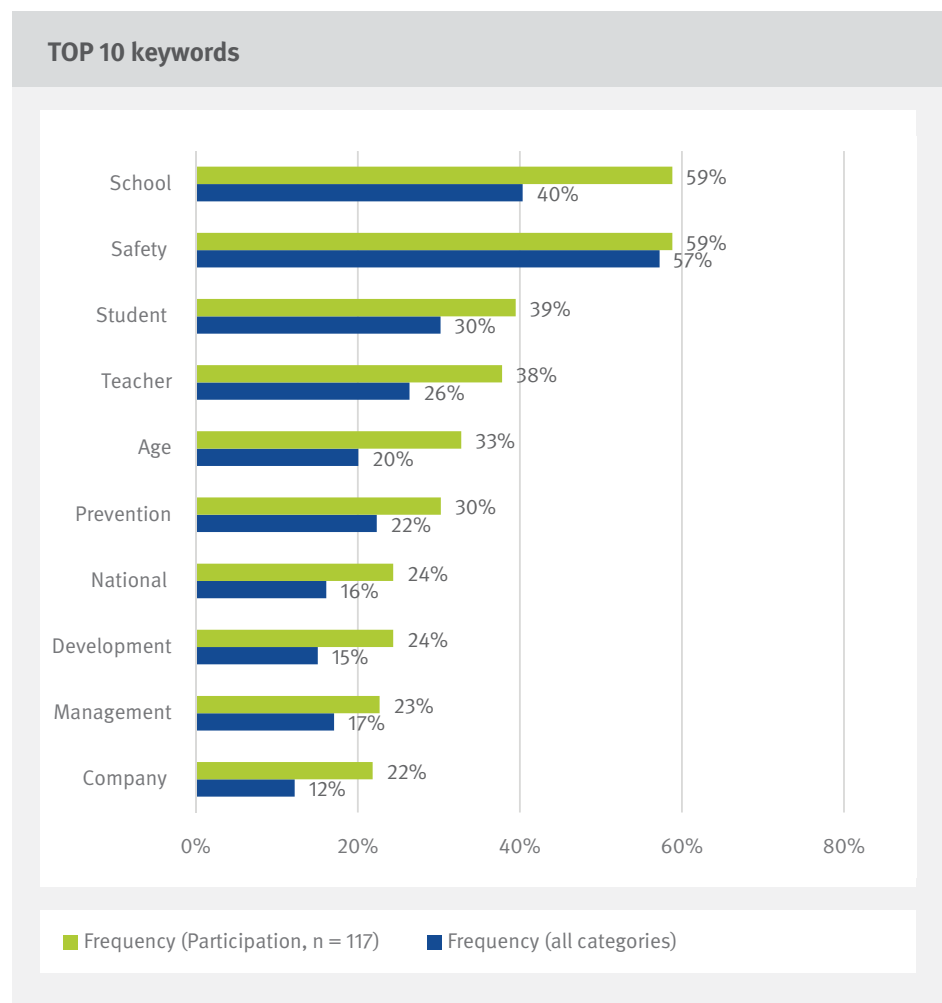
TOP 10 keywords

Figure 6: Top 10 keywords for the key element *participation*

3.2.3 Examples of good practice of participation in OSH education

The following table lists all examples that showed Level 3 *participation* in safety and health education:[7]

Level of education	Good practice examples for participation
Pre-school/ school	• TET practice at Rajamäki School in Nurmijärvi (FIN) http://www.rajamaenlukio.fi/etusivu/[8] • Equity, education and health: learning from practice (INT/EU) http://www.schools-for-health.eu/ • Project Gearshift (CA) http://www.parachutecanada.org/home/print/941/ • Is It Worth It? Teen driver safety campaign (CA) http://www.isitworthit.ca/ • YOS (Young and Old in School) (DE) http://www.august-claas-schule-harsewinkel.de/; http://schulpreis. bosch-stiftung.de/content/language1/html/53262.asp • Safety for and by everyone (NL) http://www.voion.nl/ • A whole-school approach to a healthy school (UK) http://webarchive.nationalarchives.gov.uk/20130123124929/ http://www.education.gov.uk/schools/pupilsupport/pastoralcare/ a0075278/healthy-schools • People's Theatre (CH) http://www.laerm.zh.ch/schule • The "School Environment Round" (SE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_ lkm=57&suchbereichid=16&wc_progv=57&wc_search=School envi- ronment roundSchool environment round&colid=55&rootid=314&wc_ lkm=57&details=1
Initial vocational education and training	• Health promotion in the Amar Terra Verde professional school (PT) http://www.epatv.pt/

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7   The total number of good practice examples assigned to a key element may be larger, because it was possible to assign an example to several key elements.
8   The links were checked again in advance of the publication of the report. In case of a broken link or if you need more information please search for the example at http://enetosh.net/webcom/show_websiteprog.php/_c-57/_ lkm-186/i.html

Level of education	Good practice examples for participation
Higher education	• Chemical engineering students teach OSH (FR) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=?Chemical engineering &colid=55&rootid=372&wc_lkm=57&details=1
Continuing vocational education and training	• Occupational Safety Partnership (DE) http://www.hamburg.de/arbeitsschutzpartnerschaft • Incorporating safety and health at work into the company's eco-citizenship policy (FR) http://www.armor-group.com/en/content/social-innovation-armor • Cooperation for safety (GR) https://osha.europa.eu/en/publications/reports/european-good-practice-awards-2012-2013/view • Thales France: Comprehensive approach (FR) http://www.thalesgroup.com/ • PaPsD Participatory Prevention in occupational safety and health through social dialogue (DE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=PaPsD&colid=55&rootid=595&wc_lkm=57&details=1 • LIFETIME Program (AT) http://www.arbeitundalter.at/cms/Z03/Z03_3.1.a/1342544507704/beispiele-erfahrungen/beispiele-a-z/erste-bank-der-oesterreichischen-sparkassen-ag • Länsilinjat Oy Finland: flexible working practices, redeployment, training and development (FIN) http://www.lansilinjat.fi/ • Age Masters (FIN) http://www.dart-project.eu/fileadmin/OrdnerRedakteure/0103_Achievements/Conference_Dresden/Abloy_Agemasters.pdf

3.2.4 Models for participation in OSH education

The term 'model' is used here in the sense of a way of doing things. This corresponds to the original use of the word in the Italian Renaissance (Italian modello, from Latin modulus).[9]

The following models were derived from the good-practice examples rated Level 3 for the key element *participation* and the two narrative interviews on the key element *participation*.

Model I: The 'In-Practice Model': hands-on experience with what OSH means

'We don't activate the students, they have to do this themselves.' (Varpu Kujala, Rajamäki School in Nurmijärvi, Finland)[10]

OSH (in Finnish TET) is a part of every school. 'The students generate their own experiences. When they're 14 years old, they spend five days in a company; at age 15 it's then ten days. The students organise this with the companies themselves. The traineeship is paid for by the employer. The owner or manager shows the student the company and the processes. If there any issues, the students can contact the student counsellor. We read the reports and see how well the students have participated in the company. The students then receive a final grade. TET is usually the first contact that students have with work. They experience hands-on what workplace safety and health means. When

the students come from the companies, they have experienced a lot and this helps them build self-confidence and gain an insight into their career choice.'

What do students have to do to complete a traineeship? 'Students must be mentally strong enough to do a traineeship.'

What happens if students cannot or do not want to take part? 'The curriculum is binding for everyone. If students aren't yet ready to do a traineeship, they can also take on duties at the school. For example, they can work in the school kitchen.'

Model II: The Responsibility Model: safety and health are everyone's concern

'Participation is the only way to win people over so that they take on responsibility for jointly finding practical solutions.' (Francie Sprakel, Roelof van Echten College, The Netherlands)[11]

Roelof van Echten College is the fusion of a general education school, a vocational school and an inclusive school. The aim of the college is to make safety a concern for everyone: 'Safety for and by everyone'. At the college, participation means working together with everyone (students, management, teachers, parents, partner schools, companies, emergency services, fire brigade and police). 'By giving everyone a responsibility, people are motivated, they're empowered, and they develop an awareness of safety and health.

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9   The models described in this study are not to be viewed in the sense of an 'ideal image' but rather as an 'outline' or 'sketch'. A 'good' model can act as a role model, but at the same time it is 'only' a model and it can be improved.
10   Interview on 13 July 2017
11   Interview on 8 June 2017

We have a very open environment. People ask questions themselves and get actively involved; for example, when they notice something about the school building. We look for solutions and always find one, because the school's management is also committed to safety and health. But to get involved in safety and health, you have to know the rules. Everyone at the school fills out a 'risk inventory'. This gives them a sense of safety and health in their respective areas. Subsequently, they receive the results for the place where they learn and work. Feedback sessions are conducted after the regular evacuation drills, the results of which are incorporated into the school's safety policy. Every two years, we prepare an OSH plan for our school. The works council also participates in this. The current main topic is fire protection and we will soon have a workshop with everyone at the school on errors, near-misses and how to make a report. The aim is to deve-lop a culture of prevention in all schools in the Netherlands.'

3.3 Empowerment as a key element in OSH education

3.3.1 Meaning of empowerment

Empowerment makes you and others 'strong'. Over the long term, empowerment leads to personal growth and strengthens the social environment and the organisation. Empowerment promotes safety and health and is one of the prerequisites for developing a culture of prevention.

The origins of empowerment

The concept of empowerment comes from American community psychology (Rappaport 1977) and has its roots in the social work principle of helping people to help themselves. Today, its influence can be seen in many areas of society including health promotion, youth welfare and organisational development. Empowerment is particularly important within European and international 'community building'. Although the word is not mentioned in the WHO Ottawa Charter, its similarity to the empowerment approach cannot be missed: the Ottawa Charter speaks of 'enabling people to increase control over, and to improve, their health' in the sense of a 'complete physical mental and social wellbeing' (WHO 1986) (Brandes/ Stark 2011).

In its early days, the focus of empowerment was on enabling people to critically question social and technological processes (see Stark 1998). Today, it promises to deliver an answer to how a dynamic adaptation to the changing world of work can be done at the individual and organisational level (see Sprafke 2016).

Prerequisites for empowerment

Empowerment is often associated with participation: efforts to encourage participation are presented as an attempt to empower students or employees. Empowerment, however, goes beyond participation: it is not just about taking part in temporary projects, 'but rather constantly utilising the full potential of the whole person' (Sprafke 2016, based on Voß/Pongratz 1998). There is a difference be-

tween a limited scope for decision-making in participation projects and independent decision-making, just thinking about your own innovations: The person becomes an 'intrapreneur' within the organisation or institution (Sprafke 2016). This means that empowerment plays a decisive role in the ability of people and organisations to transform.

Empowerment – a multifaceted concept

Empowerment is multifaceted and cannot be captured by a single concept (Spreitzer 1995 based on Thomas/Velthouse 1990). Therefore, in the following, a distinction is made between two different perspectives towards empowerment: (1) psychological empowerment and (2) structural empowerment.

From a psychological point of view ('psychological empowerment' – Gretchen M. Spreitzer), empowerment is defined as an intrinsic motivator for a task that manifests itself in four cognitions: (a) meaning, (b) competence, (c) self-determination, and (d) impact (Spreitzer 1995 based on Thomas/Velthouse 1990).

a. The meaning of a task comes from the worth of the task in terms of the person's values and beliefs.

b. Competence or perceived self-efficacy (Bandura 1997) is a person's belief that they can successfully carry out an action. This is not about a characteristic of a person, but the perceived self-efficacy that develops in various stages of life and, depending on the context (family, peers, school, adulthood, retirement), is different for every individual.

c. Self-determination 'is an individual's sense of having choice in initiating and regulating actions' (Self-Determination Theory; Deci/Connell/Ryan 1989 associated with autonomy). The need for self-determination is considered to be universal, regardless of any additional satisfaction gained from the result achieved.

d. Influence means the extent to which a person can influence a result, that is, the opposite of 'learned helplessness' (Seligman/Maier 1967).

From a sociological point of view, 'structural empowerment' (Rosabeth Moss Kanter) focuses on the organisational conditions for empowerment; it distinguishes between formal conditions and informal alliances (positive relationships with colleagues, superiors, classmates, peers, teachers). High levels of structural empowerment come from access to the following structures: (1) Access to opportunity; (2) Access to resources; (3) Access to information; and (4) Access to support. 'Power is "on"' to grow and learn when there is access to information, support, resources and opportunities. 'Power is "off"' if these sources are not available. Effective learning or working is then impossible. (Orgambídez-Ramos/Borrego-Alés 2014, based on Kanter 1993)

The correlation between structural empowerment and job satisfaction, stress and burnout, especially in the care sector, has been empirically proven (e.g. Wong/Laschinger 2013). This raises the question of whether these results can be generalised to other occupational groups, for example university lecturers. 'This is particularly important in

the European university context, with new innovative and professional requirements for both teaching and non-teaching employees. Job satisfaction is essential in providing a teaching quality in universities.' (Orgambídez-Ramos/Borrego-Alés 2014)

This aspect of 'Empowering Leadership' (EL) has recently become more important in the field of education. This is about salutogenic management and about the role and responsibilities of school management in developing a good, healthy school (Hundeloh/Paulus in preparation). The need for teacher empowerment has been recently highlighted in the context of international development cooperation: 'going beyond traditional instructional leadership and enabling teachers

to take on collective responsibility' (Amzat/Valdez 2017).

Since its inception, empowerment has been regarded as a central strategy for health promotion (Paulus/Deter 1998). In the area of occupational safety and health, it is particularly important in connection with the development of safety cultures (safety teams, safety walks) and in the context of leadership empowerment (see Yoon et al. 2015). In both respects, the key element of empowerment may be of strategic importance for the development of a culture of prevention in the future. The importance of empowerment for dealing with new technologies and smart learning environments is also exciting.

3.3.2 Statistical analysis of the key element *empowerment*

Description	Rating
Empowerment makes you and others 'strong'. Over the long term, empowerment leads to personal growth and strengthens the social environment and the organisation. Empowerment promotes safety and health and is one of the prerequisites for developing a culture of prevention.	• 0: No information • 1: Instruction about safety and health increases knowledge and competences • 2: The learning and working environment enables the development of skills and competences • 3: The development of skills and competences in safety and health is based on self-determined, autonomous action

Using the classification system, 344 examples of good practice from the ENETOSH database were assigned to the key element *empowerment*. This high number might be related to the fact that the importance of empowerment is difficult to grasp. The first level of the scale is enabling by instruction. Level 2 reflects structural empowerment

and Level 3 reflects psychological empowerment. Some kind of empowerment (enabling children, students, trainees and adults) was found in most of the examples. There was no difference in the overall number of cases mentioning empowerment throughout the different levels of education.
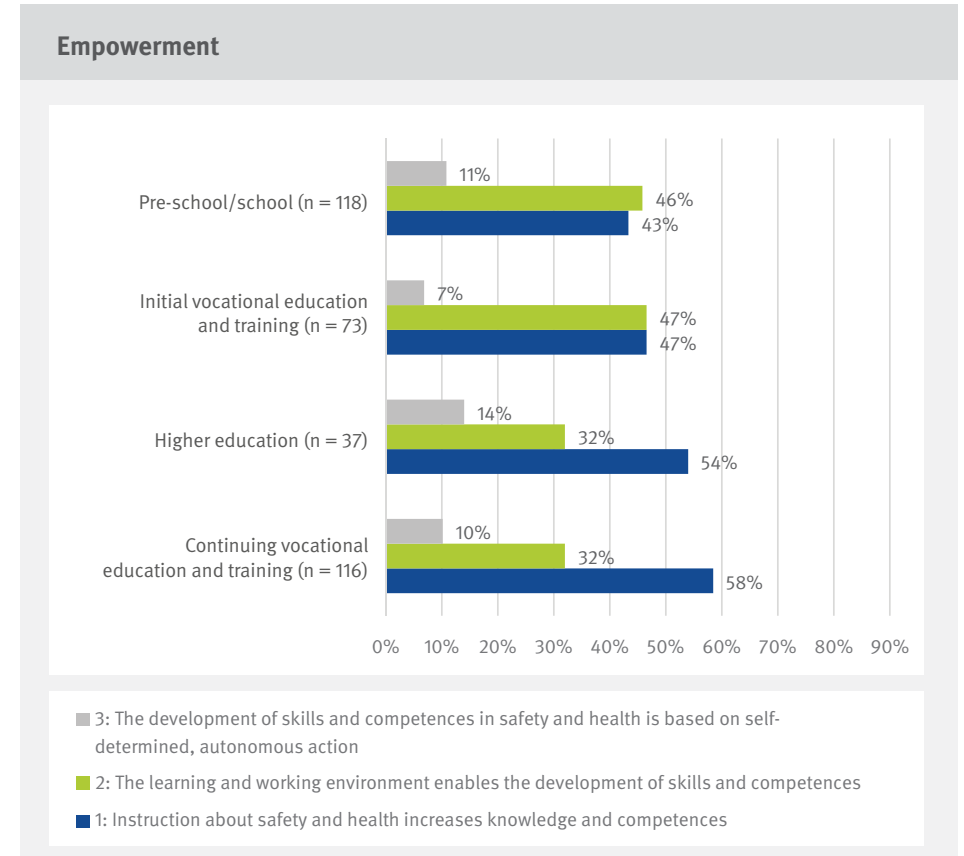
Empowerment

Figure 7: Prevalence of empowerment at each level of education

Around half of the examples that mentioned empowerment referred to the fact that competences in safety and health were taught (Level 1). This level of empowerment was particularly common in the field of 'continuing vocational education and training' as compared to other levels of empowerment in this field. At the other levels of education, the percentage of Level 1 *empowerment* was comparable to that of Level 2 *empowerment*. Level 2 *empowerment* (the learning and working environment enables the develop-

ment of skills and competences) was found in 40 percent of examples in which empowerment was mentioned. Level 2 *empowerment* was the most common form of empowerment in the field of 'pre-school/school'. Empowerment at Level 3 (the development of safety and health skills and competences is based on self-determined, autonomous action) was found in only 10 percent of the examples. This form of empowerment was lower than all other forms of empowerment across all levels of education (see Figure 7).
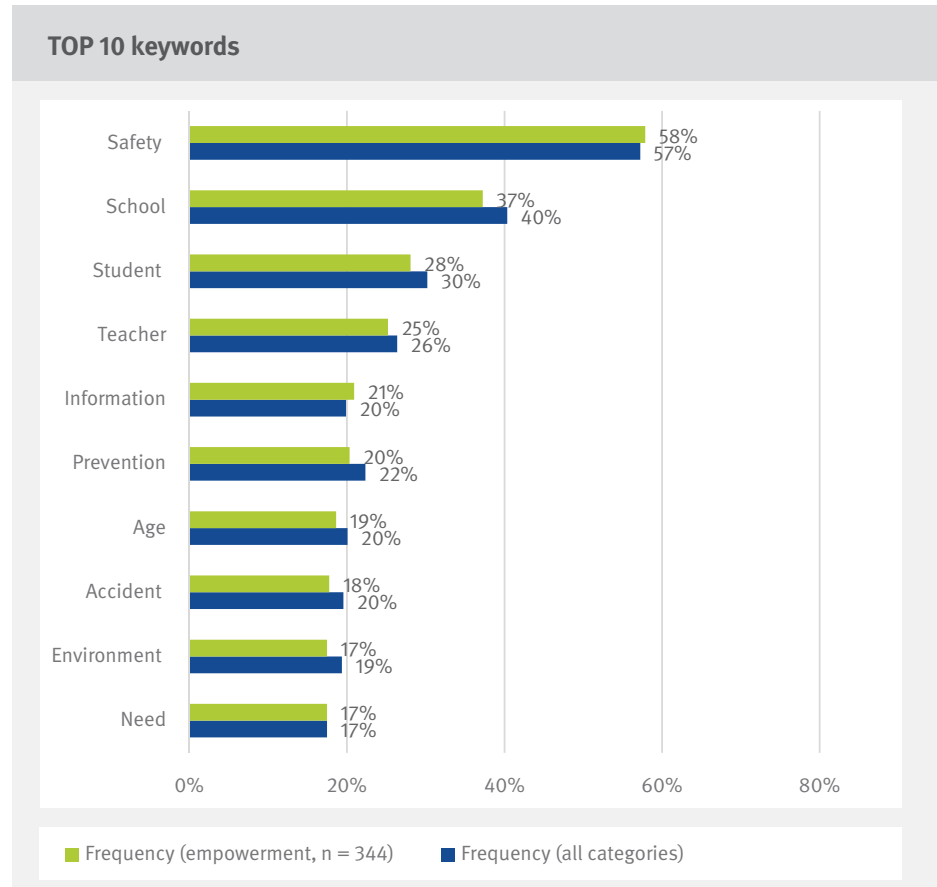
TOP 10 keywords

Figure 8: Top 10 keywords for the key element *empowerment*

The keyword 'safety' was mentioned in over half of the examples (58%) that were allocated to the key element *empowerment*. At 37 percent, the word 'school' was also frequently found in the examples. The keywords 'student', 'teacher', 'information', and 'prevention' could be found in 20 to 28 percent of examples, whereas the words 'age', 'accident', 'environment', and 'need' were mentioned in under a fifth of examples. Generally, keywords could be found less frequently in the category *empowerment* than across all other categories, with the exception of 'safety' and 'information' (see Figure 8).

Again, attention should be given to the keywords at the bottom of the Top 10; for example, although the keyword 'need' is in the Top 10 for empowerment, it occurs rather infrequently at just 17%. This was the case for the keyword 'need' across the entire sample.

3.3.3 Examples of good practice of empowerment in OSH education

The following table lists all examples that showed Level 3 *empowerment* in safety and health education:

Level of education	Good practice examples for empowerment
Pre-school/ school	• A partnership approach to creating a healthy and safe school (RO) http://www.tuiasi.ro/ • Safety and environmental awareness for all (AT) http://www.htl-donaustadt.at/ • Whole- School approach (IR) http://www.hsa.ie/ • Sustainable development programme and certification – a whole-school approach for improving schools' environmental issues and occupational safety and health (FIN) http://www.koulujaymparisto.fi/ • School development award "Good healthy school" (DE) http://www.schulentwicklungspreis.de/ • The Buddy Program (AT/DE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Buddy program&colid=55&rootid=439&wc_lkm=57&details=1 • National healthy school standard (NHSS) (UK) http://www.healthyschools.org.uk/ • Källby Gård – Safe school (SE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=&colid=55&rootid=279&wc_lkm=57&details=1
Initial vocational education and training	• DitArbejdsLiv (TheWorklife) (DK) http://www.ditarbejdsliv.nu/ • WiseUp2Work (UK) https://www.shponline.co.uk/wiseup2work-is-a-winner/ • Training of employees (LT) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=&colid=55&rootid=60&wc_lkm=57&details=1

Level of education	Good practice examples for empowerment
Initial vocational education and training (continuation)	• Preparation of schoolchildren, students and new employees for safe work (LVA) http://www.grindeks.lv/ • STAD, Stockholm Prevents Alcohol and Drug Problems (SE) http://stad.org/
Higher education	• ADD LIFE (AT) https://static.uni-graz.at/fileadmin/Weiterbildung/add-life_toolkit_en.pdf • Chemical engineering students teach OSH (FR) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=?Chemical engineering &colid=55&rootid=372&wc_lkm=57&details=1 • Learn by doing in Portugal (PT) http://www.fct.unl.pt/ • Sustainability in the organic chemistry lab course (DE) http://www.oc-praktikum.de/en-entry • Handling of carcinogenic, mutagenic and reproduction toxic substances in lab courses (KMR/CMR-dangerous substances in lab courses) (DE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=carciogenic lab&colid=55&rootid=374&wc_lkm=57&details=1
Continuing vocational education and training	• Safety Team (DE) http://www.suewag.de/ • The Construction Safety Partnership (IR) http://enetosh.net/webcom/show_websiteprog.php?wc_=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=PartnershipConstruction Safety Partnership&colid=55&rootid=199&wc_lkm=57&details=1 • Forklift Heroes (NL) http://www.heftruckhelden.nl/ • Developing new practices to ensure all organisational levels are involved in improving safety and health (ES) https://osha.europa.eu/en/publications/reports/european-good-practice-awards-2012-2013/view

Level of education	Good practice examples for empowerment
Continuing vocational education and training (continuation)	• Virtual Enterprise in 3D (IT) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Virtual&colid=55&rootid=639&wc_lkm=57&details=1 • A Toolkit for Federal Agencies on Implementing Executive Order 13548 (US) http://www.dol.gov/odep/federal-hire/ • OSHA training programme for authorised trainers (US) http://www.osha.gov/dte/outreach/construction_generalindustry/index.html • Safety training program for schools (FR) https://www.iffo-rme.fr/ • Road safety education and teacher training in Scotland (UK) http://roadsafetyscotland.org.uk/ • OSHA training program for authorised trainers (US) http://www.osha.gov/dte/outreach/construction_generalindustry/index.html

3.3.4 Models for empowerment in OSH education

The following models were derived from the good practice examples rated Level 3 for the key element empowerment, the two narrative interviews on the key element empowerment, and by drawing upon the publications of the interviewees:

Model III: The School Development Model: using safety and health to make good schools

'It is vital to experience self-efficacy: to do this you must take action yourself.' (Peter Paulus, Director of the Centre for Applied Health Sciences at the Leuphana University Lüneburg, Germany)[12]

The motto 'Using Health to Make Good Schools' describes a paradigm shift within health promotion. 'A good healthy school is a school which improves its overall educational quality through health interventions and at the same time achieves specific health objectives which belong to the educational mandate of the school. It brings the topics of education and health together in a new way by consistently placing health at the service of the school's educational mandate.' This new focus was initiated by a project run by the Bertelsmann Stiftung called anschub.de which is the German acronym for Alliance for School Health and Education (2002-2010).

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12 Interview on 11 April 2017

The 'Good Healthy School' concept is a holistic approach which integrates safety and health into school development. This is reflected internationally in the Whole School Approach (see ASCD 2014). 'One of the guiding principles of such an integrated approach is self-determination, which is made possible through empowerment and participation.'

'At the level of the individual, this means enabling people to lead a self-determined, autonomous existence and to avoid alienation. An important strategy of empowerment is participation, which has the potential to promote the competences and abilities of the people involved and thus contribute to social balance. True participation, in terms of the empowerment approach, has a direct effect on promoting good health. Participation in change processes not only promotes the competences and abilities of the individual, but also allows individual and social self-efficacy to be experienced and thus has a positive influence on safety and health and well-being. For example, teachers can encourage students to organise their own project work in an open environment where there are no pre-determined results. Similarly, teachers can put conflict situations up for discussion and compare their self-image with the external image under supervision.'

At the structural level, the capacity of schools to achieve their own targeted development is strengthened. 'The "Good Healthy School" concept integrates safety and health into school development and thus has a direct influence on learning and teaching processes, on leadership and management, and on the school culture and environ-ment. The aim is for schools to be able to continue their school development independently after completing the project. School projects for the "Good Healthy School" are thus designed as "Help for Self-Help".'

To implement the 'Good Healthy School' concept, it is crucial that all activities are geared to the school's specific conditions, characteristics, tasks and objectives; this applies to both the individual and the structural level. The school itself decides which safety and health topics to work on. Ideally, all groups of people in the school (students, teachers, parents and non-teaching staff) are involved in this decision-making process.

The school must have a need for a project. At the start of the project, the strains and resources of the school are comprehensively identified and necessary changes are determined. A steering committee is formed, and comprehensive training is given to both the members of the steering committee and to process facilitators.

'Students accept this form of empowerment because they like these kinds of projects.' However, ultimately all members of the organisation, including teachers and parents, must be willing to try out new things and to get involved in putting their ideas into practice. The willingness of all participants to change is a critical factor in all organisational change processes.

Ideally, safety and health are not brought to the school from outside in the form of a project or programme, but 'rather from within as part of the school, part of everyday school work and as part of a mutually stimulating school development process. When good processes and outcomes are brought in line with the development of safety and health, then safety and health contribute to the quality of education.'

However, to empirically prove 'evidence' of the 'Good Healthy School' model, it is not enough to evaluate the outcomes and effectiveness of pilot projects and programmes. 'What has been missing is practice-based evidence which shows that, even in normal everyday school life, the concepts are suitable and effective. This requires implementation research that fully documents the process of implementation and links this with the results of an evaluation of effectiveness.' This type of research may, in the future, contribute nationally and internationally to the dissemination and sustainable anchoring of good models in practice.[13]

Model IV: **The Active Citizenship Model: the intergenerational dialogue**

'People are empowered if they are capable of critical reflection of themselves and their social conditions and can deduce from this which behaviour is correct, including the correct behaviour towards others.' (Andrea Waxenegger, Director of the Centre for Continuing Education at the University of Graz, Austria)[14]

'The "power" in empowerment is important. Empowerment means self-mastering: the self-empowerment to shape and reshape one's own life. Empowerment is a prerequisite for participation: it takes a 'robust self' to personally get involved in a process. Empowerment is the prerequisite for someone being able to learn in a self-organised way.'

The aim of the ADD LIFE project (ADDing quality to LIFE through intergenerational learning via universities, 2006 - 2008) was to explore different models of inter-generational learning at universities in six European countries. Given demographic change, learning and education are becoming increasingly important in the process of getting older. In addition, there are socio-structural changes that reduce social contact and relationships between generations. Younger people today are often one step ahead of the older generation, which shakes up the traditional relationship between the generations. 'Generation' can be understood as belonging to an age cohort (e.g. 50+), having a common biographical background of experience (e.g. the 1968 protests) or belonging to a particular 'age-related culture' (e.g. digital natives).

The ADD LIFE project developed the model of intergenerational learning in mixed-age groups. The experiences from the project were included in a European Toolkit (Waxenegger 2008). At the end of the project, two guidelines for intergenerational learning were published, one for scientific training and the other for adult education (Ludescher/Waxenegger 2016; Paulweber/Haring/Kreilinger 2016).

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13   In addition to the interview with Peter Paulus, the following literature was used: Paulus/Deter 1998; Paulus 2008 (anschub.de); Paulus 2010; Paulus 2014; Dadaczynski/Paulus/Hundeloh 2015.
14   Interview on 26 June 2017

As part of the ADD LIFE project, six themed modules and six facilitated open modules were developed. Key action areas from the European Agenda were selected during the development of the themed modules. These were: civil society, culture, employability and mentoring, health sciences, information society – digital literacy, sustainability and development.

The themed modules are designed in such a way that they enable participants to work together with others on these topics by providing suitable learning arrangements. However, the learning experiences and the acquired knowledge should not only contribute to personal development but should also be shared with others. The individual courses are designed so that participants can become promoters for their topic and become a 'computer buddy', a health promoter or a 'culture guide'. Through group or team work, participants are encouraged to take on the role of moderator or mentor. This allows them to build self-confidence to continue working with others outside the course.

In order to fully realise participants' potential, six facilitated open modules were also developed. The content and the learning settings of these modules were developed in a collaborative process involving both younger and older participants. This involved them negotiating what to learn and how to learn. In an open-learning setting, the process of negotiating course content and learning methods is as important as the content itself.

Experience with the open modules showed that even 'open' learning needs a framework, for example, a selection of topics and specific requirements for the intergenerational learning setting: topic relevance for all participants, mutual and equal appreciation, an age spectrum of approximately 50 years, a maximum group size of 30 people, clear rules for working together, continuity, and interactive learning and teaching methods. Intergenerational learning is still not mainstream at universities. By offering this, universities could take on a new role in the development of diversified life concepts in later life and at the same time prepare people for civic engagement.

By developing the model, the ADD LIFE project has become a pioneer of intergenerational learning and has made a significant contribution to sustainability at the University of Graz. The project has created a focus on education for all population groups. Comprehensive, lifelong learning requires intergenerational learning.[15]

3.4 Sustainability as a key element in OSH education

3.4.1 Meaning of sustainability

What makes prevention education and training successful and effective? How does education and training have to be organised so that it is sustainable, i.e., it continues to have an effect over all phases of life and it contributes to the development of a long-term culture of prevention?

Origins of sustainability

The term 'sustainability' comes from the Latin *sustinere* meaning to 'hold under'. Since the 1980s, sustainability has been used mainly in the sense of human sustainability on planet Earth. Sustainability as part of the concept of sustainable development was defined by the United Nations Brundtland Commission as follows: 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' (UN 1987) In 1992, the WHO Commission on Health and Environment published a report called 'Our planet, our health' which dealt with the complex interactions between health status and environmental changes in the context of social and economic development. It was the year of Rio and the UN Conference on Environment and Development where, for the first time ever, the right to sustainable development was enshrined and the Member States committed themselves to implementing sustainable development (Agenda 21; UNCED 1992). The following year, WHO adopted its Global Strategy for Health and Environment. The most recent milestone for sustainable development is the UN 2030 Agenda which brought the world's nations together in 2015 to set goals for sustainable development for all countries (and not just developing countries). This collection of 17 goals are known as the Sustainable Development Goals (SDGs) (UN 2015).

The UN 2030 Agenda corresponds to the Education for Sustainable Development (ESD) World Action Programme with its 'Education 2030 Framework for Action' (UNESCO 2017). Today, sustainability is its own educational goal.

Excursus: Sustainability as an educational goal

In its role as United Nations agency for education and the education sector, UNESCO coordinates all ESD activities. The goal is to embed the principles of sustainable development in national education systems around the world.

Education and the education sector have a special role to play here: on the one hand, education is its own goal (SDG 4), on the other hand, it is a means to achieve all other SDGs. In the context of the UN 2030 Agenda, education is considered a 'key enabler' and is thus formally responsible for implementing SDG 3 'Good Health and Well-Being' and SDG 8 'Decent Work and Economic Growth'. Education is sustainable if it enables people to think and act in a sustainable way. It enables individuals to understand the impact their own actions have on the world and to make responsible choices: How do my decisions affect future generations or people in other parts of the world? Sustainability as an educational goal should be a part of all levels of the education system: from early childhood education to vocational education.

The concept of sustainability has evolved over the years and now goes far beyond a purely environmental concept. It is based on the understanding that the environment, economy and society influence each other; there will be no long-term economic and social progress without an intact environment (Müller-Christ/Giesenbauer/Tegeler 2017). UNESCO has developed a guide for educational professionals on the use of ESD in

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15   In addition to the interview with Andrea Waxenegger, further literature and references concerning ADD Life can be found here: https://zentrum-weiterbildung.uni-graz.at/en/zum-nachlesen/

learning for the SDGs. This guide describes cross-cutting key-competences (systems thinking, anticipatory competence, understanding and reflection on norms and values, strategic abilities, ability to collaborate, critical thinking, self-awareness, problem-solving) and learning objectives for each SDG. It also contains suggestions for lesson topics, suitable learning approaches and practical examples. Suggested topics for SDG 8 'Decent Work and Economic Growth' include: the contribution of economics to human well-being, and the social and individual effects of unemployment; economic ethics; formal and informal labour, labour rights (especially for migrants and refugees), forced labour, slavery and human trafficking; entrepreneurship, (social) innovation, new technologies and local economies for sustainable development (UNESCO 2017).

If, and how, sustainability will become an educational goal in national education systems is still to be explored (see Müller-Christ/Giesenbauer/Tegeler 2017). This requires 'indicator frameworks' to be created 'that establish standards for EDS learning outcomes' (UNESCO 2017).

In short, mainstreaming ESD into education is a blueprint for the future development of mainstreaming OSH into education. This raises the issue of finding a comparable policy-oriented approach to mainstreaming OSH into education, international guidelines for systematic implementation at national level and key indicators for assessing implementation in the education system. Sustainability is a topic that young people accept.

Sustainable integration of safety and health into education

Integrating safety and health into education is sustainable when individuals acquire the competences (Level 1) needed to not only adapt to changes in our life and work (e.g. faster pace, disruptions, complexity, diversity) resulting from globalisation, migration, digitalisation and automation, but to find creative solutions to them.

Good institutional framework conditions for learning and working can support this process of developing competences and can contribute to sustainability (Level 2). Examples of this are (cf. Section 3.4.3):

- A national OSH policy aimed at integrating safety and health into all levels of the education system (pre-primary and primary school, secondary school, junior college, university): by encouraging students to view safety and health as part and parcel of their daily life at an early stage, this will set the stage for the creation of a strong safety and health culture at the workplace (Singapore).
- A standardised provincial curriculum for science, computer studies, career studies and experimental learning: for students, safety education can become an essential element of 'what you need to know', rather than an add-on (Ontario, Canada).
- Ongoing training of OSH teachers through regular staff development courses and on-site visits: a system for mainstreaming OSH into education can be developed (Malta).
- An OSH unit at the Ministry of Education (Malta).

- Good collaboration between schools, between universities, between companies, schools and universities (Denmark, Germany, Italy).
- An award: school development award 'Good Healthy School' or 'Sustainability Award' in research (Germany).
- A 'Workforce Engagement Steering Group' consisting of managers, OSH representatives, trade unionists and other industrial experts at company level (UK).

- The establishment of a Work-Life Centre based on the corporate social policy of a company (Austria).

In principle, integrating safety and health into education is sustainable if safety and health are integrated into organisational development and are thus an integral part of school culture or company culture (Level 3).

3.4.2 Statistical analysis of the key element *sustainability*

Description	Rating
Integrating safety and health into education is sustainable if it enables people to think and act in a sustainable way, when it is done across all stages of life and learning, and when it contributes to the development of a sustainable culture of prevention.	• 0: No information • 1: Individuals acquire competences to be able to cope with challenges • 2: The creation of an institutional framework supports OSH education • 3: Safety and health are principles of the organisation (integral part of leadership, the organisational development, related to the quality of education)

Some form of sustainability was found in almost all examples (97%). There was no difference in the number of cases mentioning sustainability throughout the different levels of education (see Figure 9).

Level 1 *sustainability* ('individuals achieve competences in safety and health to be able to cope with challenges') was by far the most common form of sustainability mentioned in all examples. It was also the most common form of sustainability found

at each of the levels of education. There was no noteworthy difference in the prevalence of Level 1 *sustainability* across the levels of education.

At only 21 percent, examples that mention Level 2 *sustainability* ('the creation of an institutional framework that supports OSH education') were far less frequent than those of Level 1. The prevalence of Level 2 *sustainability* was also constant across all levels of education.
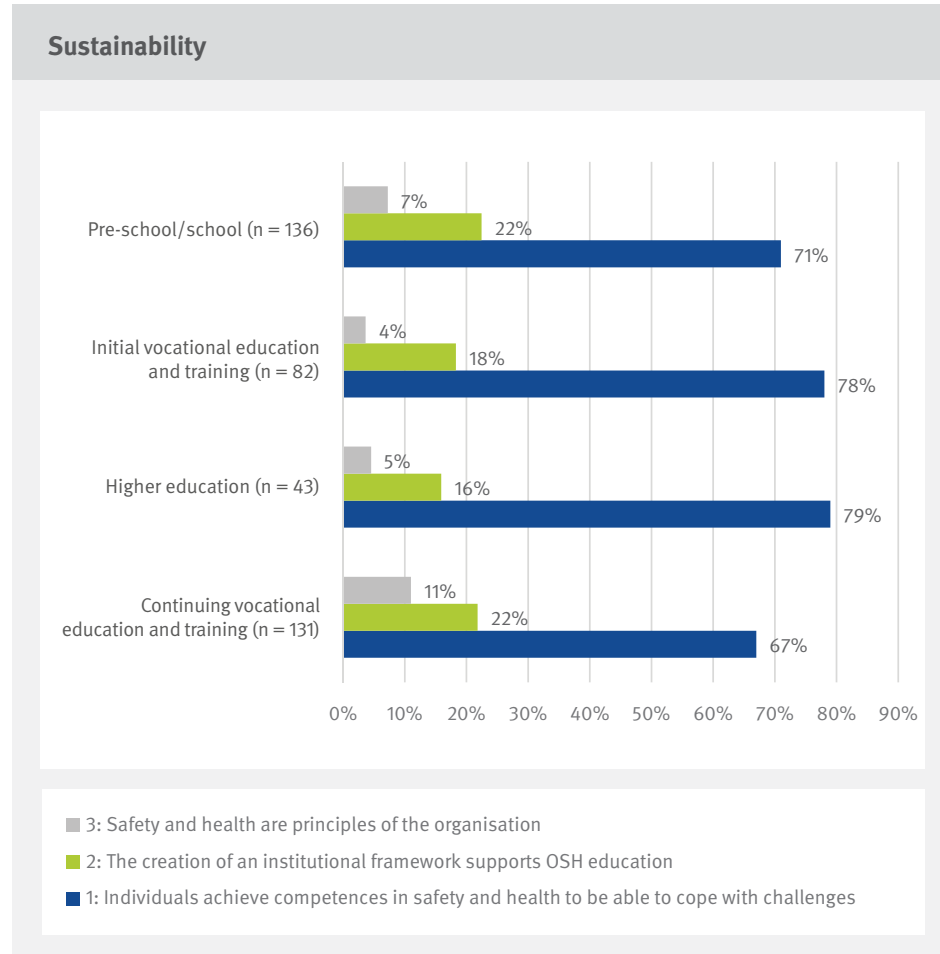
Sustainability

Figure 9: Prevalence of sustainability at each level of education

TOP 10 keywords

Figure 10: Top 10 keywords for the key element *sustainability*

Only 8 percent of examples mentioned Level 3 *sustainability* ('safety and health are principles of the organisation – integral part of leadership, organisational development, related to the quality of education'). The field of 'continuing vocational education and training' had the highest percentage of Level 3 *sustainability* (11%), whereas other fields ('pre-school/school' (7%), 'initial vocational education and training' (4%), and 'higher education' (5%)) were much lower (see Figure 9).

The most common keyword found for the key element *sustainability* was once again 'safety' (56%). It was followed by the word 'school' at 36 percent and 'student' at 27 percent. The keywords 'teacher', 'information', 'prevention', 'accident', 'environment', and 'age' could be found in around a fifth of examples in this category. The least common keyword was 'workplace' at 17 percent. 'Information' was the only keyword which was more common in this category than across all other categories (see Figure 10).

3.4.3 Examples of good practice of sustainability in OSH education

The following table lists all examples that showed Level 3 *sustainability* in safety and health education:

Level of education	Good practice examples for sustainability
Pre-school/ school	• PreEmployment Training (PET) Initiative (SI) http://www.wshc.sg/ • Mainstreaming OHS education in the school system in Ontario (CA) http://ccohs.ca/ • Peripatetic safety and health teachers (MT) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Peripatetic&colid=55&rootid=609&wc_lkm=57&details=1 • Safety and Health in the elementary school "Kongresi I Manastirit" Skopje (MK) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Skopje&colid=55&rootid=333&wc_lkm=57&details=1
Initial vocational education and training	• Good healthy school at Erich-Gutenberg-Berufskolleg (DE) https://www.egb-buende.de/ • Promotion of risk awareness in children and young people (IT) https://www.delgiudice.it/category/20-il-valore-del-latte
Higher education	• fitcampus - Health Promoting University (DE) http://www.fh-erfurt.de/fhe/fachhochschule/portrait/engagement/gesundheitsfoerdernde-hochschule/ • BASE (DE) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=&colid=55&rootid=446&wc_lkm=57&details=1
Continuing vocational education and training	• Spreading a safety culture through proactive management practices, individual and team participation (TR) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Tofas&colid=55&rootid=709&wc_lkm=57&details=1

Level of education	Good practice examples for sustainability
Continuing vocational education and training (continuation)	• Workforce engagement toolkit (UK) http://www.stepchangeinsafety.net/ • Incorporating safety and health at work into the company's eco-citizenship policy (ES) http://www.armor-group.com/en/content/social-innovation-armor • Safety and health promotion at Zaragoza University (ES) http://uprl.unizar.es/ • From ugly duckling to swan: The way forward for micro and small enterprises in occupational safety and health (ES) http://www.protonelectronica.com/ • Hazenberg Bouw BV programme 55+ (NL) http://www.hazenberg.nl/ • LIFETIME (AT) http://www.arbeitundalter.at/cms/Z03/Z03_3.1.a/1342544507704/beispiele-erfahrungen/beispiele-a-z/erste-bank-der-oesterreichi-schen-sparkassen-ag • Age Masters (FIN) http://www.dart-pro-ject.eu/fileadmin/OrdnerRedakteure/0103_Achievements/Conference_Dresden/Abloy_Agemasters.pdf • REWE strategy of sustainability (DE) https://www.rewe-group.com/de/nachhaltigkeit/mitarbeiter • Teacher training in health education (FIN) http://www.ylioppilastutkinto.fi/

3.4.4 Models for sustainability in OSH education

The following guiding model and features of sustainable project management were derived from the good-practice examples rated Level 3 for the key element *sustainability* and the two narrative interviews on the key element *sustainability*:

Model V: The Cross-Sector Model: involve multiple stakeholders from OSH and education

'I would like to emphasize the importance of cooperation between educators and occupational safety and health experts. Teachers know how to teach. Occupational safety and health experts know about occupational safety and health. They do not necessarily know about each other's field of expertise. When they cooperate, they can raise the bar. They can develop ideas for fulfilling the curriculum. They can develop detailed plans for lessons – 'good practice examples'. And they can develop functioning methods for teaching occupational safety and health.

They can help and inspire 'ordinary' teachers to implement occupational safety and health into general teaching. It is important that the cooperation functions on different levels: at ministerial level, within the social partners, organisations and unions at sector level, and educational institutions from top to bottom. Politicians and civil servants from the ministries have to cooperate with labour inspectors and the social partners at the top level. Their task is to improve and strengthen the demands into legislation and curriculum. The social partners can create attention and arouse awareness within organisations and unions in the different working sectors.'[16]

Model VI: Sustainable project management in OSH education

There are certain features of sustainable project management that are worth considering:

1. There must be a need for the project.
2. The project must be relevant to the participants (e.g. a project on bullying only for those who are affected).
3. The educational facility should be given support during implementation of the project.
4. All the important stakeholders must work together.
5. It is important for the stakeholders to network.
6. Projects have a beginning and an end. Thought must be given at the start of the project on how to continue once the project has finished.

7. In order to do an evaluation, there has to be follow-up projects.
8. Ideally, projects continue on their own after they have officially ended.
9. The results of the project must be made available and disseminated nationally, across Europe and internationally, as well as actively at events and trade fairs.
10. Participants should have fun.

(Peter Paulus, Susanne Ulk)[17]

3.5 Networking as a key element in OSH education

3.5.1 Meaning of networking

Networking is about relationships between people and organisations. We are specifically talking here about networking between people and organisations from the policy areas of OSH and education. Networks and networking represent a new mode of interacting and communicating in times of digital and global transformation.[18]

Origins of the term

The term goes back to sociological research on social networks in the 1950s (Kiefer/Holze 2018). The term became established following Manuel Castells study on 'The Rise of the Network Society' with his perceptive analysis of the consequences of the shift from the industrial society to the information society (Castells 1996). According-

ing to the new paradigm of the network, our relationship functions on the basis of horizontal links (nodes) rather than in hierarchical systems (with separate functional areas).

Working definition

Based on the writings of Holger Bienzle and his colleagues from the field of education, networks can be defined as follows: 'Networks are structures for cooperation between individuals or institutions over a longer period of time in order to attain joint objectives and to generate added value for its members.' (Bienzle et al. 2007) Alternatively, following Tim Tregenza from EU-OSHA: 'An occupational safety and health network is an interconnected group of people with an interest in occupational safety and health who have reciprocal relationships and who act to achieve their own individual or shared goals.' (Tregenza 2014)

Examples for networking

Examples of networks that connect OSH and education include (see also Bienzle et al. 2007):

- an informal (internet-based) community of practice, e.g. an online questions & answers network on OSH such as ArboAntwoord, The Netherlands (Rhebergen et al. 2012);
- a local cooperation structure between institutions, e.g. established in the project 'Ergonomic classroom' between a statutory accident insurance institution

for the public sector at state level and two schools, promoted by the German Social Accident Insurance;
- a teacher association such as the National Union of Teachers (NUT) in the UK or the European Trade Union Committee for Education (ETUCE), both extremely active in the field of OSH and education;
- a project partnership funded on the basis of a work programme with the ultimate aim of becoming a sustainable key player in the field of education and training in safety and health in Europe, such as ENETOSH; and
- a new global network initiative of the International Labour Organisation consisting of a 'Global Coalition on Safety and Health at Work' with the aim to implement the Sustainable Development Goals (SDG) and a global database on OSH Knowledge Agencies, Institutions and Organisations: INTEROSH (Mattila/Leppink/Takala 2018; Loiselle 2018).

Basically, networks are aimed at a variety of cooperation partners (Bienzle et al. 2007), that is, a distinction can be made between networking and cooperating. Although this distinction is not clear-cut, it helps to provide additional guidance with the overview of good-practice examples for networking from the ENETOSH database (see Chapter 3.5.3: Network = [Network = [N], Cooperation = [C]).

Organisational forms of networks

It is helpful to distinguish between different types of networks. Tim Tregenza has identified four types of networks:

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16   Susanne Ulk, Consultant ulk@live, Denmark, Press conference at the ENETOSH kick-off event for the SEE countries in Zagreb on 17 April 2012
17   Interviews on 11 April 2017
18   In the following sections, the terms network and networking are used synonymously.

1. Support Network – a small organic group that supports each other (e.g. School Ambassadors for OSH in Denmark; Interuniversity Cooperation Initiative – UK-US-NL (see Chapter 3.5.4)
2. Content Network – a network where information is collected and shared in order to learn from good practices (e.g. EU-OSHA Focal-Point Network; INTEROSH of ILO; ENETOSH)
3. Advocacy Network – the key function of this network is to represent the interests of its members and to raise awareness of a particular issue among non-members (e.g. European Network of Safety and Health Practitioners (ENSHPO); Occupational Internship Program (OHIP), US)
4. Collaboration Network – a loose grouping of complementary institutions with shared interests that present themselves as a whole or as subgroups, and start activities through their connections (e.g. Partnership for European Research in OSH (PEROSH); ENETOSH).

Analysis of network structures

In order to better understand and make the most of networks and networking, it makes sense to take a more in-depth look at their relationship structures:

Firstly, a distinction must be made between formal and informal connections: 'Next to and below visible organisational and collaboration structures often lies the hidden reality of informal networked relationships and interactions between people'. Informal channels can be very effective. (Bienzle et al. 2007, based on Donald Chisholm 1989) Secondly, it is beneficial to distinguish between strong and weak ties for networking. In a study on job-seeking, Mark Granovetter found that the majority of respondents had found their job through somebody they knew. In this situation, it was not strong ties that were important but rather tips and recommendations from acquaintances (weak ties). Weak ties hold the key to some surprising, non-redundant and often valuable information (Holzer 2009; Granovetter 1973).

In principle, relationship networks are multidimensional (multiplex). This means it is possible to distinguish between information relationships, exchange relationships, power relationships, friendship relationships, etc. (Bienzle et al. 2007).

Managing networks

There are four different functions as part of managing networks:

1. Selection – Who should be involved? 'Networks have to be exclusive: they must have the right people.' (Hoeneveld see chapter 3.5.4; cf. Kiefer/Holze 2018: 'the binary logic of inclusion/exclusion')[19]
2. Allocation – How should responsibilities and tasks be distributed? 'Everyone must get involved: providing content for the website, newsletters ...' (Masanotti see chapter 3.5.4)
3. Regulation – Which rules have to be formulated? For example: 'A network meeting should be held twice a year.' (Masanotti see chapter 3.5.4)
4. Evaluation – What feedback loops are planned? For example: a self-evaluation as part of a SWOT analysis prior to regular updates of the ENETOSH strategy.

It is also important that networks demonstrate structural tension; for example, between diversity and uniformity, between flexibility and specificity, between collaboration and competition, and between formality and informality. These tensions and contrasts must be brought into a productive balance within the network (Bienzle et al. 2007 based on Jörg Sydow 1999).

Characteristics of networks

In 2016, the ILO conducted an analysis of the key characteristics of well-functioning OSH-networks. Objectives of this study were: (1) to generate a standard set of descriptors of networks for constitutional models and for functions and outputs; (2) to produce six regional network profiles on the basis of the standard descriptors and (3) to produce a cross-cutting analysis and evaluation of the six regional networks as regards their structures and function.

The standard set of descriptors covers the following items: mission & policy; formal status and constitution; basic orientation; geographical coverage; membership and stakeholders; organization, focal point, institutional support; leadership and coordination; resources – human, technology, financing; strategy and programmes; functions, activities and knowledge management; outputs, quality, quantity, overall achievements.

The following regional networks were analysed: Inter African Association for the Prevention of Occupational Risks (IAPRP); Latin American Association of Safety and Hygiene at Work (ALASEHT); The Asean Occupational Safety and Health Network (ASEAN OSH-NET); Baltic Sea Network on Occupational Safety and Health (BSN); Partnership for European Research in Occupational Safety and Health (PEROSH); South-East European Network on Workers' Health (SEENWH). (Rantanen 2018)

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19 ENETOSH is an 'open network'. But in principle the 'binary logic' is in force: Someone decides to become a member; ENETOSH accepts the request if the requirements for a membership are met (e.g. the applicant is related to OSH and education and the applicant is willing to contribute actively to the work of the network).

3.5.2 Statistical analysis of the key element *networking*

Description	Rating
Networking is about relationships between people and organisations. Specifically, about networking of people and organisations from the policy areas of OSH and education. Networks and networking represent a new mode of interacting and communicating in times of digital and global transformation.	• 0: No information • 1: Exchange of information & experience, and mutual support between those who are responsible for safety and health and education • 2: Cooperation across groups and institutions from different policy areas (e.g. OSH institutions, health insurance providers, local community forums) • 3: Networking as a strategic alliance: formation of sustainable, comprehensive, cross-cutting measures

Information on networking was found in 64 percent of the examples within the whole sample. Networking was mentioned particularly often in the field of 'higher education' (79%) and in around half of the examples in the field of 'initial vocational education and training' (51%).

Level 1 *networking* (exchange of information & experience, and mutual support between those who are responsible for safety and health and education) could be found in 61 percent of all cases. There was no difference in occurrences across levels of education for this form of networking.

Thirty-three percent of examples mentioned 'cooperation across groups and institutions from different policy areas' (Level 2). It was

especially common in the field of 'higher education' (44%). Level 2 *networking* was also found in around one third of examples in 'pre-school/school' (31%) and 'continuing vocational education and training' (34%). In the field of 'initial vocational education and training', only 21 percent of cases mentioned Level 2 *networking*.

Level 3 *networking* (networking as a strategic alliance: formation of sustainable, comprehensive, cutting-cross measures) could be found in 7 percent of all examples. This form of networking was more prominent in the fields of 'pre-school/school' (9%) and 'initial vocational education and training' (10%) and was less common in the fields of 'continuing vocational education and training' (4%) and 'higher education' (6%) (see Figure 11).

Networking
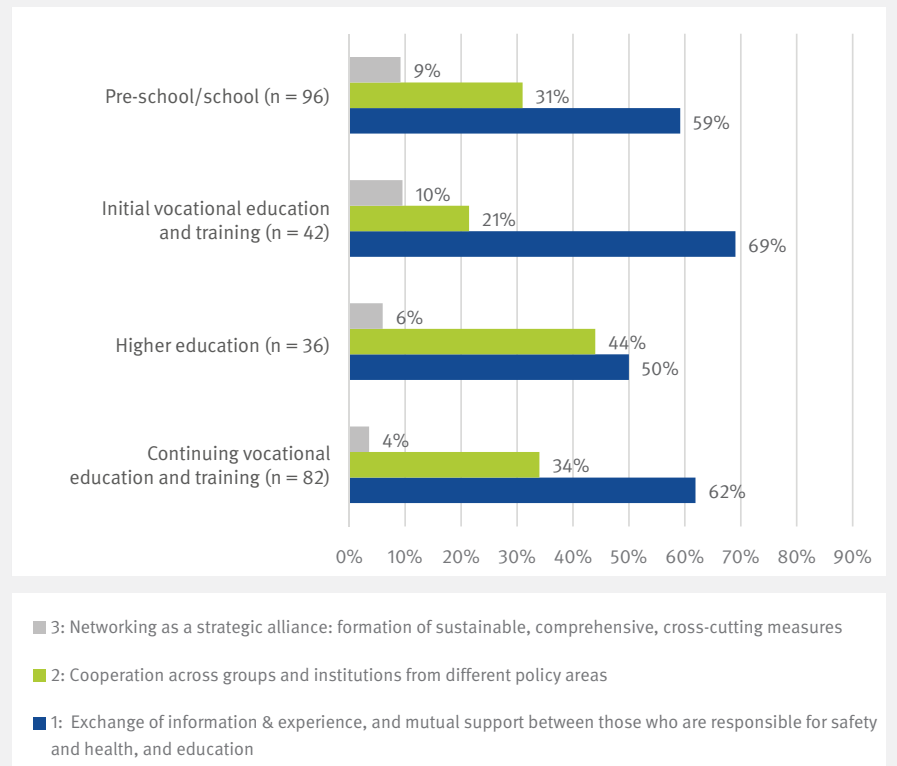
Figure 11: Prevalence of networking at each level of education

As in the previous categories, 'safety' was the most frequent keyword mentioned (57%). It was followed by the keyword 'school' (46%). Least frequent were the keywords 'management' (19%) and 'learning' (19%). In between these were the words 'age', 'accident', 'environment', 'prevention', 'teacher', and 'student' ranging from 20 to 33 percent. The keywords were mentioned with almost the same frequency across all key elements as they were in the key element *networking*, the only remarkable difference was 'school' with a margin of 6 percent (see Figure 12).

TOP 10 keywords

Keyword	Frequency (networking, n = 256)	Frequency (all categories)
Safety	57%	57%
School	46%	40%
Student	33%	30%
Teacher	29%	26%
Prevention	22%	22%
Environment	22%	19%
Accident	21%	20%
Age	20%	20%
Learning	19%	18%
Management	19%	17%

■ Frequency (networking, n = 256) ■ Frequency (all categories)
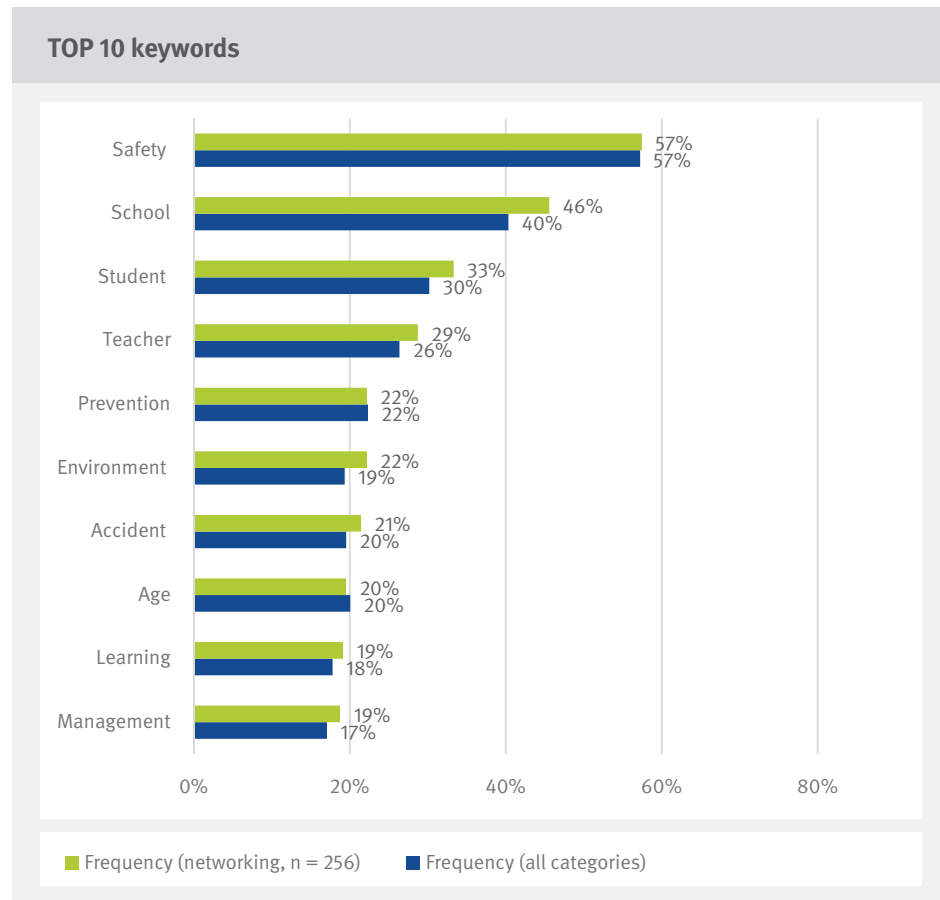
Figure 12: Top 10 keywords for the key element *networking*

3.5.3 Examples of good practice of networking in OSH education

The following table lists all examples that showed Level 3 *networking* in safety and health education. The differentiation between cooperation [C] and networking [N] was added as a result of the content analysis:

Level of education	Good practice examples for networking
Pre-school/ school	• The ergonomic classroom as a contribution to good and healthy school (DE) http://publikationen.dguv.de/dguv/pdf/10002/iag3062.pdf [C] • We have a lot in common. Primary Education Project (ES) http://enetosh.net/webcom/show_websiteprog.php?wc_c=57&wc_lkm=57&suchbereichid=16&wc_progv=57&wc_search=Primary&coli d=55&rootid=605&wc_lkm=57&details=1 [C] • Global plan for children's environmental health (INT) http://www.who.int/ceh/en/ [N]
Initial vocational education and training	• Occupational safety and health at Vocational and Technical Training Schools (TR) https://www.csgb.gov.tr/En/Contents/Projeler [C] • OHIP Occupational Health Internship Program (US) http://aoec.org/ohip/ [N]
Higher education	• Initiatives for teaching safety and risk management in civil engineering studies in German universities (DE) http://www.bgbau.de/ [C]
Continuing vocational education and training	• work in tune with life - move Europe (INT/EU) http://www.enwhp.org/enwhp-initiatives/9th-initiative-ph-work.html [N]

3.5.4 Models for networking in OSH education

Model VII: **The Support Network: connecting people**

'Finding the right people for the network is the real challenge.' (Dick Hoeneveld, Safety Science Group at Technical University Delft, The Netherlands)[20]

'Networks must be exclusive, meaning you have to have the right people in the network, and you need to be in contact with the right people outside the network. A network 'lives' when the network benefits everyone – information has to be shared and you have to support one other. To do this, it can be helpful to take a look yourself at who has what information and who might need something. Helping each other and keeping in touch is important to maintain the network.

You have to focus on people; this helps with networking. At meetings and at congresses, it is important to identify the relevant people. Even before a conference, it is a good idea to look for people who you would like to meet and then speak with these people at the event. For large projects with multiple partners, the various institutions will often nominate people. For smaller or internal projects, it is important to select the people yourself: who should be in the network?

It is becoming increasingly important to link education and safety, and to form networks in these fields. For example, universities are becoming increasingly complex and international due to digitalisation. New technologies are forcing universities to act faster and be more flexible. This requires new information and knowledge, which comes through networking. In addition, the students are 'digital natives', which is not quite the case for teaching staff at universities. It is important to exchange information and experiences regarding teaching methods and to learn from each other. Moreover, the safety and health issues at universities are very similar, so it's worth exchanging ideas.'

A recent, important example of international networking between universities in the field of safety and health is the 'Inter-university Cooperation UK-US-NL': 'National and international developments confront universities with safety management challenges that are generally too big for a single institute to handle. Examples of this are: an increase in the number of students and workers with different cultural backgrounds; increased administrative burden on scientific and support staff related to safety and health; the social impact of technological advancements (information flow via Google and social media, increasing interuniversity mobility among researchers transferring safety routines from one university to another); a reduction of technical staff with experience in safety management in university laboratories; a more multi-disciplinary approach between the sciences resulting in researchers being potentially exposed to hazards they have little technical expertise in; and new risks related to new technologies.

However, there is rising awareness among safety and health practitioners, both nationally and internationally, that the answer lies in cooperating, sharing knowledge, tools and data, and developing evidence-based tools.

Recent examples of such cooperation are the establishment of the Californian Center for Lab Safety (UCCLS) that operates at international level, the Dresden International 'Safe and Healthy University' Conference, and the safety and health experts exchange programme run by Dutch universities. In 2016 and 2017, workshops were conducted to exchange good practices and to avoid 're-inventing the wheel'. A project is currently being run to collect and compare accident data for university laboratories in the United Kingdom, United States of America, the Netherlands and Germany.'

Model VIII: **The Collaboration Network: strategically build and use networks**

'When a network is set up, generally speaking it's not done very strategically.' (Guiseppe Masanotti, Experimental Center for Health promotion and Education, University of Perugia, Italy; advisor to the European Network for Workplace Health Promotion (ENWHP))

'For me, networking means building a community, sharing information and knowledge and exchanging problems and solutions. A network must be open, but there must also be resources for working together, that is, a network has to have funding. Networking should be interdisciplinary.

The networks I'm involved in have specific goals. In order to conduct European research projects, you need European networks such as the European Network for Workplace Health Promotion (ENWHP). A group in the network has just made an application to the EU. There must be joint projects, simply meeting is not enough. You have to work on something together, such as the MEPMIS project for blended training on alcohol and substance abuse in the workplace. A network is also an important communication channel for disseminating project results at European, national and regional level. Exchange with national networks, which vary from country to country, is also important. International networking makes it possible to improve awareness of safety and health in your own country by sharing and comparing with other countries. For example, many Romanians and Albanians work in Italy and it is important to network with colleagues from these countries in order to find out what matters most in terms of preventing workplace accidents and illnesses for migrants from these countries.

And finally, safety and health in the workplace must be integrated into the curricula of all universities. Everyone, whether teacher, architect or psychologist, will later work on projects where safety and health play a core role. Unfortunately, the education system in Europe is very complex. At the very least, we should have a small OSH training package that is given to all professions.'

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20   Interview on 30 May 2017

3.6 Statistical analysis of additional elements

In Sections 3.2 to 3.5, the sample (N = 404) of good-practice examples from the ENETOSH database was analysed in detail, both numerically and in terms of content, with respect to the key elements: *participation, empowerment, sustainability* and *networking*.

In addition, the following additional elements were included in the study: *focus on target group, evaluation, prevention approach, policy focus, level of aggregation* and *type of intervention,* and *type of activity* and *methods*. The results of the statistical analysis of the additional elements are presented below. Ratings could only be done for the elements *focus on target group, evaluation* and *prevention approach*. Due to the redundancy of the results from the keyword analysis, they are not presented here.

3.6.1 Focus on target group

The term 'target group' is ambivalent, because it is heteronomous and tends to stigmatise (Mielck 2014). Nevertheless, it is used in this study under the following conditions: the target group is clearly described (Level 1), the target group is fully involved (Level 2), or the demands and needs of the target group are taken into consideration (Level 3).

It may be helpful to differentiate between the actual target group (e.g. trainees being made aware of safety and health issues), practitioners, disseminators and policy makers. The target group was described in 88 percent of cases. In the examples found in the field of 'continuing vocational education and training', 80 percent of cases reported a description of the target group. At all other levels of education, the percentage of examples describing the target group were around 90 to 95 percent.

Description	Rating
The term 'target group' is ambivalent. It is used in this study under the following conditions: the target group is clearly described, the target group is fully involved, or the demands and needs of the target group are taken into consideration.	• 0: No information • 1: Target group is clearly described • 2: The target group is actively involved • 3: The measures are based on the demands and needs of the target group

The target group was clearly described (Level 1) in almost two thirds of examples (64%). The highest amount of Level 1 descriptions could be found in 'higher education' (77%), whereas the amount of descriptions was markedly lower in 'pre-school/school', at only 55 percent.

The total percentage of examples in which the target group was actively involved (Level 2) was 33 percent. The proportion of Level 2 *focus on target group* was particularly high in 'pre-school/school' (43%). Level 2 *focus on target group* was mentioned in 32 percent of examples in the field of 'continuing

Focus on target group
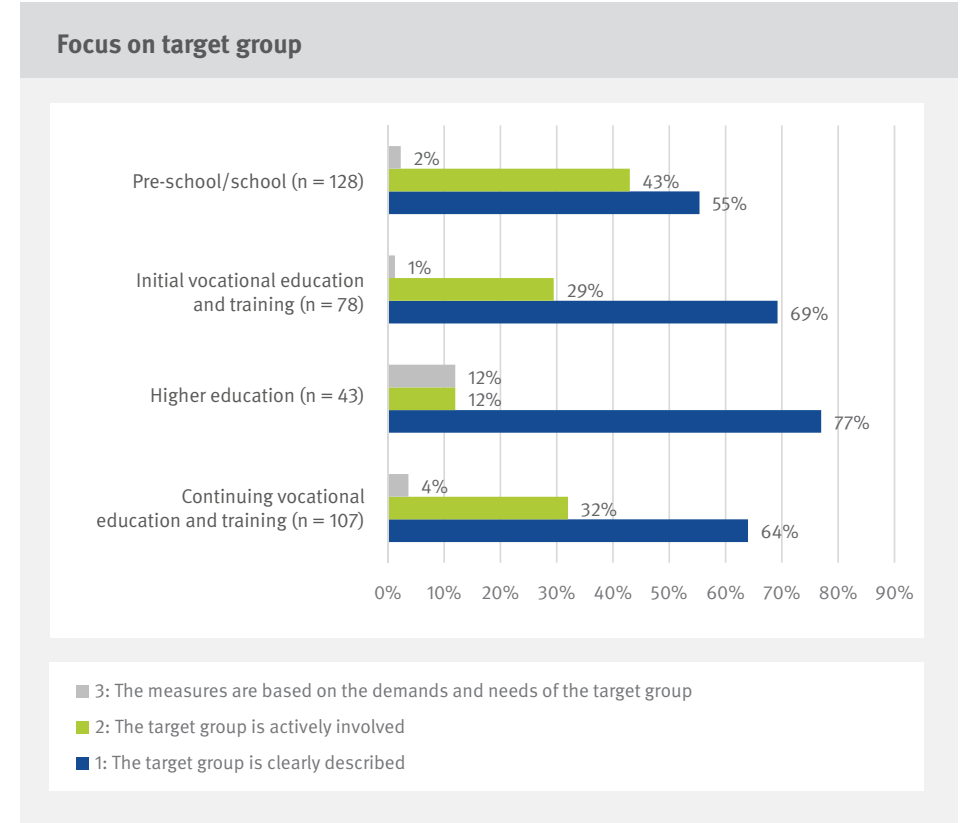
Figure 13: Prevalence of focus on target group at each level of education

vocational education and training', 29 percent in the field of 'initial vocational education and training', and a mere 12 percent in 'higher education'.

It was exceedingly rare, that the examples were based on the demands and needs of the target group (Level 3). Only 4 percent of

examples reported this form of focus on target group. The proportion of Level 3 *focus on target group* was two percent in 'pre-school/school', one percent in 'initial vocational education and training', and four percent in 'continuing vocational education and training'. However, it was notably larger in 'higher education' at 12 percent (see Figure 13).

3.6.2 Evaluation of OSH education

This section discusses whether examples of good practice in the ENETOSH database have been evaluated, and if so, how. Statements regarding the effectiveness of the projects cannot be made here. There are very few studies on the effectiveness of education and training in safety and health (see Konijn et al. 2017 and Robson 2010).

Evaluations can be carried out internally (internal evaluation) by someone directly involved with the project or externally by experts or under expert supervision (external evaluation). The evaluation can be done during the project so that the results can be

fed directly back into the project (evaluation of processes) or it can be done retrospectively to confirm whether or not the objectives of the intervention where achieved (evaluation of results) (Kirkpatrick/ Kirkpatrick 2006).

Only 13 percent of examples offered any information on evaluations. Evaluations were most frequently described in the examples from the field of 'higher education' (17%). A similar frequency of descriptions was found in the field of 'continuing vocational education' (15%). Less frequent were the cases found describing evaluation in 'initial vocational education and training' (12%) and 'pre-school/school' (9%).

Description	Rating
Evaluation refers here to both evaluation of the results (summative) and evaluation of the processes (formative).	• 0: No information • 1: Documentation of results • 2: Evaluation of results: analysis of success factors and barriers • 3: Evaluation of results and processes

Figure 14: Prevalence of evaluation at each level of education

Documentation of results (Level 1) was the most common form of evaluation described across all levels of education (42%). It was most prevalent in the field of 'continuing vocational education', with 52 percent. Similarly, 'initial vocational education and training' came in at 40 percent and 'pre-school/school' at 38 percent.

In 31 percent of the cases which described evaluation, the description referred to the evaluation of results: analysis of success factors and barriers (Level 2).

There were almost no differences between levels of education. This form of evaluation was used in 38 percent of cases categorised

as 'pre-school/school', in 30 percent of cases categorised as 'initial vocational education and training', in 29 percent of cases categorised as 'continuing vocational education and training', and in 25 percent of cases categorised as 'higher education'.

Least common was the evaluation of results and processes (Level 3), which was men-

tioned in only 27 percent of all cases describing a form of evaluation. Level 3 *evaluation* was most common in the field of 'higher education' (50%) and least common in the field of 'continuing vocational education and training'. It was mentioned in 38 percent of cases in the field of 'pre-school/school' and 30 percent of cases in the field of 'initial vocational education and training' (see Figure 14).

3.6.3 Prevention approach in OSH education

The classic approach to prevention focus both on the individual (behaviour) and on the organisation (setting). In addition, prevention is currently experiencing a 'cultural transformation'. There is increasing interest in the 'culture of prevention', that is, whether and how safety and health are being lived out in a school, university, further education institution or company. This is about safety and health becoming important for the individual and society as a whole, and what role the social environment plays (parents, peers, teachers, managers) (see Section 1.3.2 above).

The following attempts to illustrate this difference based on the data from the study.

Description of classic prevention	Rating
A classic approach to prevention includes both behavioural prevention and settings-based prevention.	• 0: No information • 1: Focus on behaviour • 2: Focus on organisational development • 3: The individual and structural approach are linked together

A reference to a classic prevention approach could be found in most examples (97%). There were no notable differences across levels of education.

The most common form of prevention was behavioural prevention (Level 1). This form of prevention was predominantly found in 'initial vocational education and training' (78%). It could be found in 68 percent of cases in 'pre-school/school' and 61 percent of cases in 'higher education'. The percentage of examples mentioning a classic prevention approach in the field of 'continuing vocational education and training' was slightly lower at 58 percent.

A reference to organisational development (Level 2) was found in 19 percent of examples. Level 2 of a classic prevention approach was most frequent in the fields of 'higher education' (30%) and 'continuing vocational education and training' (24%). It was less frequent in 'pre-school/school' (15%) and 'initial vocational education and training' (12%).

Classic prevention approach
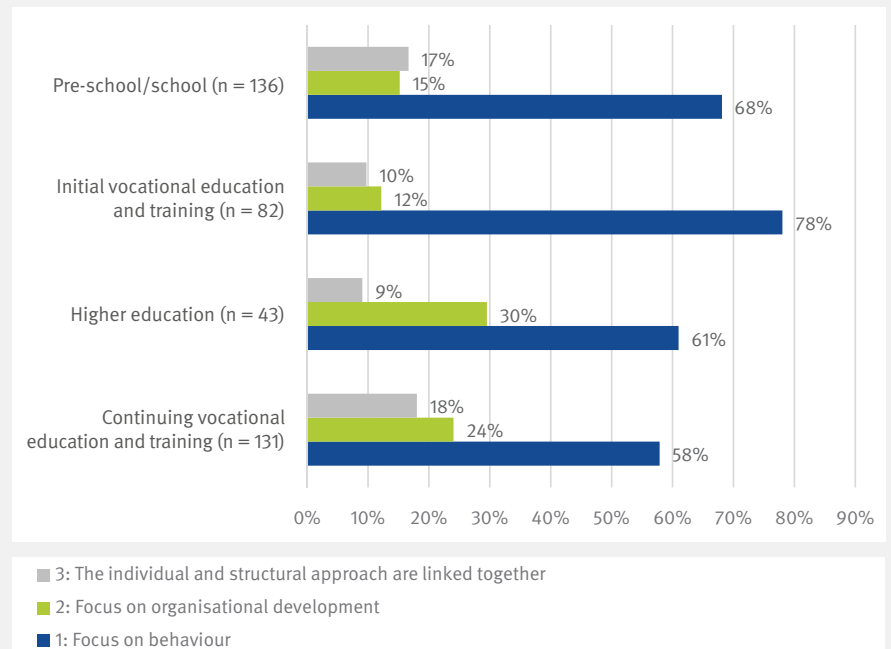
Figure 15: Prevalence of the classic prevention approach at each level of education

A link between the individual and structural-based approaches (Level 3) could be found in only 15 percent of examples; but this study could actually identify at least 20 examples. For example in the field of 'pre-school/school', the proportion was 17 percent and in the field of 'continuing vocational education and training' it was 18 percent. The lowest percentage of examples mentioning Level 3 *classic prevention approach* was found in 'initial vocational education and training', at just 10 percent (see Figure 15).

Description of comprehensive prevention	Rating
A comprehensive prevention approach goes beyond the classic approach to prevention which focuses solely on risks. It not only involves the prevention of work-related accidents and diseases, but also promotes a complete physical mental and social well-being in the workplace. When safety and health are an integral part of an organisation's culture, one speaks today of a culture of prevention.	• 0: No information • 1: The aspect of culture is considered (e.g. school culture, organisational culture within a company) • 2: A connection between safety and health and the organisational culture is made/considered • 3: Safety and health are an integral part of daily life (e.g. in a school or company) (Culture of Prevention)

Information on the comprehensive prevention approach could be found in 44 percent of all cases. More examples describing cultural aspects could be found in the fields of 'pre-school/school' (47%) and 'continuing vocational education and training' (50%) than in the fields of 'initial vocational education and training' (35%) and 'higher education' (32%).

In 63 percent of all examples, the aspect of culture was considered (e.g. school culture, organizational culture within a company) (Level 1). There was no significant difference in prevalence of this form of prevention approach across levels of education. The prevalence ranged from 60 to 66 percent.

Examples in which a connection between safety and health and the organisational culture was made/considered (Level 2) were

markedly less common. Only 20 percent of examples mentioned this form of prevention. The percentage of examples describing Level 2 *comprehensive prevention approach* in 'higher education' (40%) was high compared to all other levels of education. 'Pre-school/school' came in at only 17 percent, 'initial vocational education and training' at 21 percent and 'continuing vocational education and training' at 16 percent.

Level 3 (safety and health are an integral part of daily life) was mentioned in 17 percent of all examples, making it relatively rare. It was found in 19 percent of examples in 'pre-school/school', 14 percent of examples in 'initial vocational education and training', and 21 percent of examples in 'continuing vocational education and training'. Noticeably, there were no examples found in 'higher education' (see Figure 16).
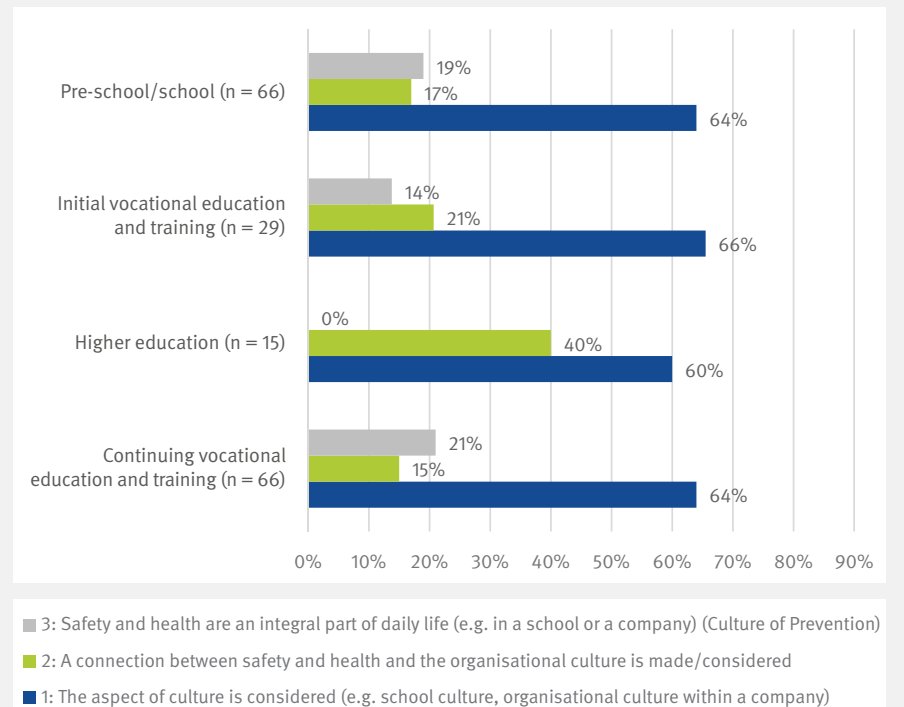
Figure 16: Prevalence of a comprehensive prevention approach at each level of education

3.6.4 Policy focus, level of aggregation and type of intervention

Policy focus in OSH education

Sixty-one percent of examples could be allocated to the domain of education, whereas 41 percent could be allocated to the domain of business. Examples from education, therefore, outweighed those from business. Eighty-two percent of examples talked about the topic 'safety'. Similarly, 81 percent talked about 'health promotion'. In 63 percent of cases, both topics were combined. The vast majority of examples (95%) were voluntary with only a small portion (5%) being mandatory (see Figure 17).
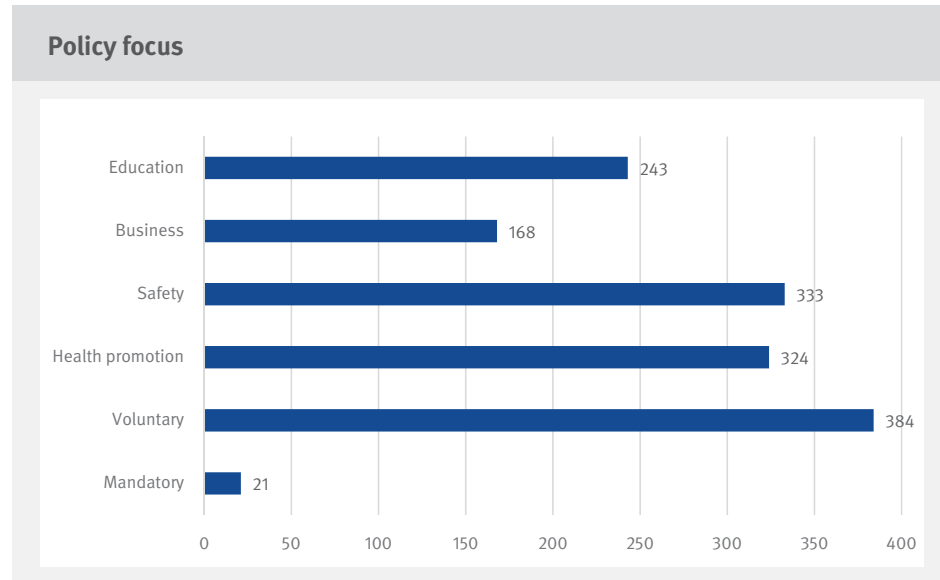
Policy focus

Figure 17: Policy focus across the sample

Level of aggregation in safety and health education

Most examples referred to the individual level (micro level). Fifty-eight percent of examples were allocated to this level. The settings approach (micro or meso level) was used by 22 percent. This looks at the environment and framework conditions in which people live, learn, and work. Twenty percent of examples were at the macro level (population), including campaigns for prevention and online tools for a variety of different populations (see Figure 18).

A large number of examples from both education and business mentioned safety promotion, health promotion or a combination of the two. The majority of examples focused on interventions at the individual level (micro level), whereas a fifth of examples took a settings-based approach or population approach (meso or macro level).

Level of aggregation
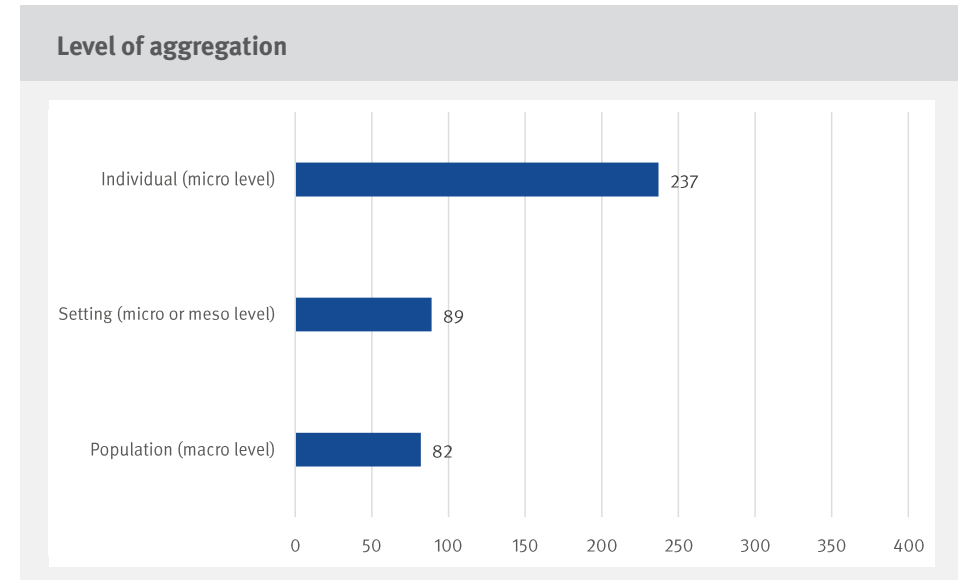
Figure 18: Level of aggregation across the sample

Type of intervention in safety and health education

The vast majority of examples (97%) provided information about the target group.

Awareness-raising could be found in 69 percent of examples and health education in 57 percent. Safety and health briefings (15%) and rehabilitation measures (1%) were less common (see Figure 19).

3.6.5 Type of activity and method in OSH education

Type of activity in safety and health education

The most frequent activities were 'courses/lectures/seminars'. Forty-six percent of all examples used these. In contrast, 21 percent of examples used campaigns, 10 percent used human resource development and 9 percent used consultation. Organisational development or school development was a topic in 15 percent of all cases. Surprisingly, social media was only mentioned in 6 percent of the examples (see Figure 20).

Figure 19: Type of intervention across the sample
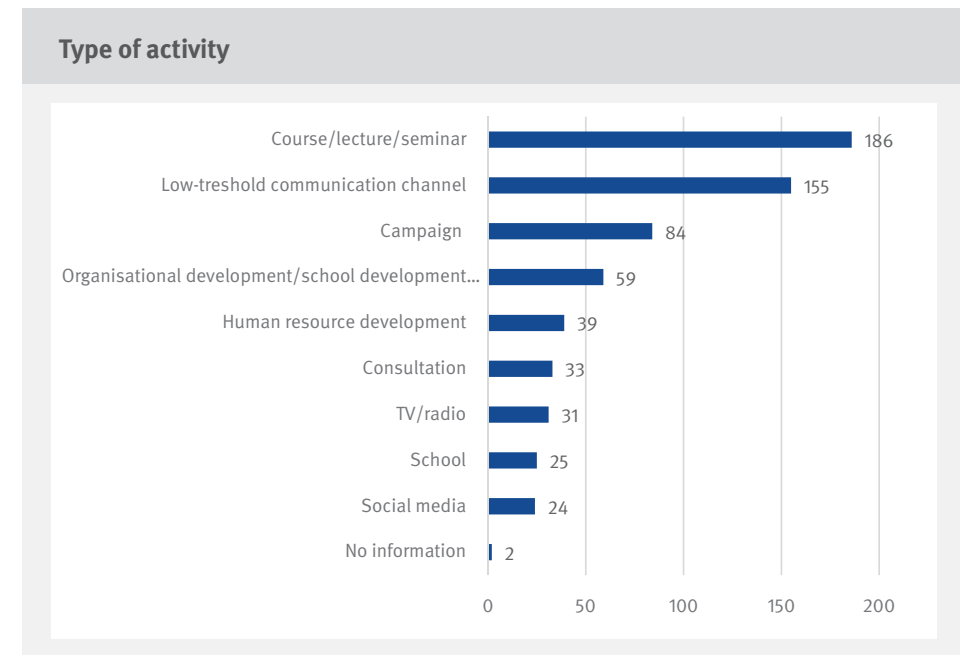
Figure 20: Type of activity across the sample

Method in safety and health education

Particularly common methods were curriculums (45%), the creation of safe and healthy learning and working environments (35%) and interactive approaches such as interactive websites, multimedia websites or multilingual websites (27%). Between 15 and 21 percent of all examples used books, guides, fact sheets, real life references, risk assessments, video clips or fun approaches. Least common (9% or less) were approaches that used personal stories from the working world, symbolic figures/cartoon characters, child safety management tools or virtual enterprises (see Figure 21).

Methods

Curriculum	181
Create safe+healthy learning/working…	140
Interactive approach, interactive website	111
Book/guide/fact sheet	85
Real life reference	77
Risk assessment	71
Video clips	63
Fun approach, quiz	59
Stories, personal stories from the working world	37
Symbolic figure/cartoon character	27
Child safety management tool	20
Learn about school as a workplace	6
Songs, poems	4
Virtual enterprise	4
Internship	1

Figure 21: Methods used across the sample

Almost half of the examples integrated safety and health measures through courses/lectures/seminars, and slightly fewer examples integrated the measures through low threshold communication channels. Particularly common methods were curriculums, the creation of safe and healthy learning and working environments, and interactive approaches such as interactive websites, multimedia websites or multilingual websites.
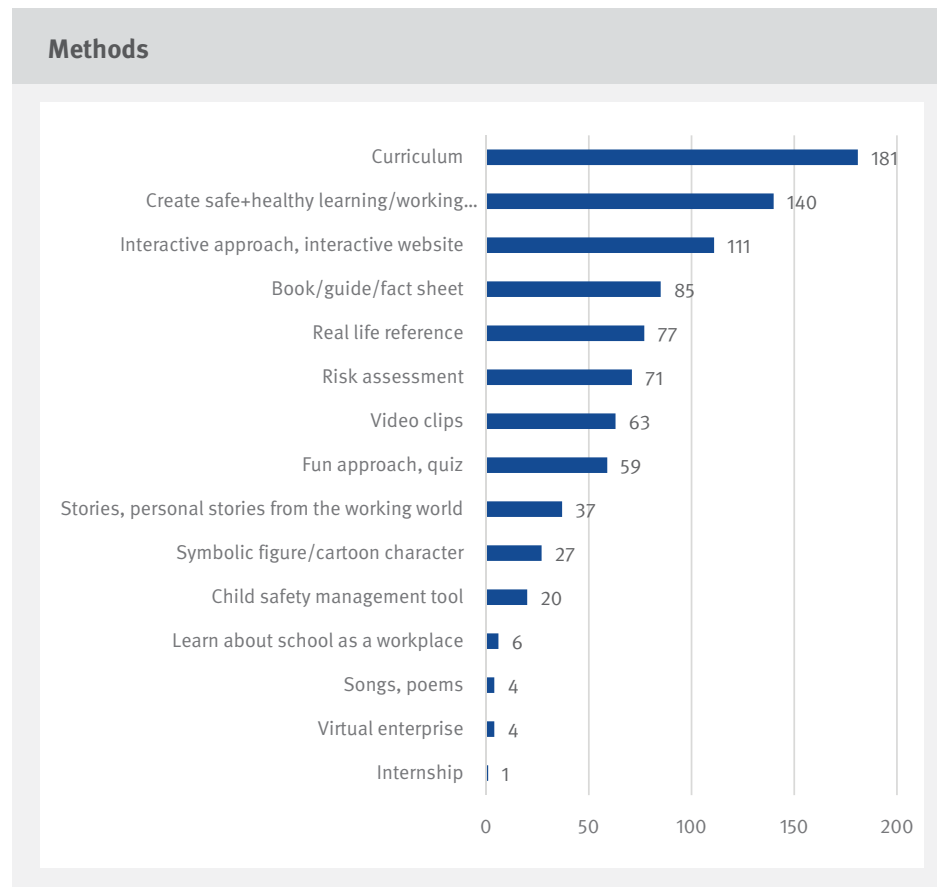
3.7 Prevalence of elements across the levels of education

Empowerment, sustainability, and *prevention approach* could be found in most of the examples. Due to this, there is no noteworthy difference in their prevalence across different levels of education. *Focus on target group* was found in nine out of ten examples at all levels of education, except 'continuing vocational education and training' where it was only found in eight out of ten cases. Because e*mpowerment, sustainability, prevention approach,* and *focus on target group* were so constant across all levels of education, they will be mostly excluded from the following summary.

Pre-school/school

The most prevalent key element in the field of 'pre-school/school' was *networking*. It was followed closely by *comprehensive prevention approach*. *Participation* could be found in approximately a third of examples; remarkably, over half of these describe Level 3 *participation*. The least prevalent element was *evaluation* at just 9 percent (evaluation was the least prevalent element across all levels of education). Interestingly, over a fifth of these cases were rated Level 3 for evaluation.

Initial vocational education and training

Sustainability and *prevention approach* could be found in 100% of examples in 'initial vocational education and training', making them the most widespread key elements at this educational level. Interestingly, only a fraction of cases mentioning *sustainability* talked about safety and health as principles of the organisation (integral part of leadership, organisational development, relation to quality of education) (Level 3). *Networking* was described in just over half of the examples. Around one in six examples mentioned participation, over half of which described Level 3 *participation*. *Comprehensive prevention approach* was mentioned in 35 percent of cases. The least common element was evaluation. Nearly a third of the examples mentioning evaluation talked about Level 3 *evaluation*, making it as prevalent as Level 2, and almost as common as Level 1 *evaluation*.

Higher education

The most prevalent key element in the field of 'higher education' was *networking*. *Comprehensive prevention approach* was mentioned in around three out of ten

cases, although Level 3 *comprehensive prevention approach* was not found in any of the examples. *Evaluation* and *participation* were the least prevalent elements, with 17 percent of cases mentioning each one respectively. Notably, three quarters of cases mentioning participation described Level 2 *participation*, making this form far more frequent in the field of 'higher education' than in any other level of education. Also worth mentioning is the fact that Level 3 *evaluation* was twice as frequent at this level of education as Levels 1 and 2.

Continuing vocational education and training

By far the most common key element at this level of education was *networking*; however, only 4 percent of examples described Level 3 *networking*. *Comprehensive prevention approach* was described in half of the cases, one fifth of which described Level 3. A fifth of cases mentioned participation, with almost a third of these talking about people actively participating in overall planning, implementation and the decision-making process (Level 3). Evaluation was mentioned in 15 percent of examples.

4 Conclusions

The ENETOSH database is a unique resource for documenting the integration of safety and health into education and training. This study presents a detailed analysis of the data set, identifies guiding models of good practice, and highlights trends in integrating safety and health into education systems.

The analysis was largely based on the key elements of *participation*, *empowerment*, *sustainability* and *networking* taken from the WHO settings approach. The examples of good practice were assigned to the key elements and ranked on a scale of 1-3. A quarter of all examples of good practice were ranked Level 3 for at least one of the key elements. Almost all of the examples included *sustainability* (97%) and nearly as many referenced *empowerment* (85%). More than half of the examples (64%) were related to *networking* and over a quarter to *participation* (27%). In terms of the individual levels of education, there was also a clear prevalence of the key element *networking*. In contrast, the element *evaluation* was poorly represented across all levels of the education system apart from 'higher education' where it was frequently mentioned. The significant correlation between *networking*, *participation* and *sustainability* and other elements makes them potential 'markers' for integrating safety and health into education and training.

The following scrutinises the results for the key elements, summarises the good models, and makes recommendations for the future.

Participation

More than a quarter of examples of good practice referenced *participation*. The most common form of participation was 'teamwork'. However, 'active participation in planning and decision-making processes' could only be identified in 16% of the examples in the sample. The highest value was found in 'vocational education and training', the lowest value in the field of 'higher education'.

Participation as a 'mantra' (Johanna Klatt) is not enough to promote the integration of safety and health into education and training. Furthermore, participation does not just mean 'joining in'. Participation must be structured and organised. The learning and working conditions that allow participation in the first place must be made available. Teachers must be supported in their role as process and project facilitators. Finally, participation requires empowerment so that responsibility can be assumed.

It could be helpful to describe the various forms of participation based on real-life projects for integrating safety and health into education and use this to develop recommendations for the different levels of education.

Empowerment

Almost all examples from the sample were assigned to the key element *empowerment*. Which educator or trainer does not want

to empower? However, evidence was only found in 10% of the examples for 'self-determined, autonomous action' (Level 3). More than half of the examples from 'continuing vocational education and training' (58%) still use the classic paradigm of instruction for safety and health.

In order to be able to switch 'power' on, it is important to have the right organisational conditions. The importance of 'structural empowerment' is particularly prevalent in the field of 'pre-school/school'. Simply being allocated a task or responsibility is often not enough. The task must also have meaning and be associated with the feeling that something can really be done (psychological empowerment). Teachers can encourage students without overburdening them. The experience of being competent associated with such a task is, in itself, conducive to safety and health and well-being.

It is vital to systematically use empowerment in the future for the integration of safety and health into education. This is shown by current examples such as 'Empowering Leadership' for school directors. An important topic, both now and in the future, is the ability to learn and teach in smart learning environments while taking into account safety and health.

Sustainability

Integrating safety and health into education is sustainable if it enables people to think and act in a sustainable way (Sustainable Development Goal 4 and particularly SDG 3 and SDG 8), when it is done across all stages of life and learning, and when it contributes

to the development of a sustainable culture of prevention.

The individual comes first in the ENETOSH database, across all levels of the education system. The individual has to be equipped with the necessary competences to deal with the challenges resulting from the changing world of work. Evidence of the institutional framework necessary for this could only be found in 21% of good-practice examples in the ENETOSH database. Only 8% of the examples mentioned that safety and health are integral parts of organisational development and that they are related to the quality of education.

An emerging trend is a concerted effort between the World Action Programme 'Education for Sustainable Development' (ESD) and the integration of safety and health into education. For example, the dual function of education within the ESD program, both as its own goal (SGD 4) as well as a means to achieving the goals 'Good Health and Well-being' (SDG 3) and 'Decent Work and Economic Growth' (SDG 8), is reflected in the model of the 'Good Healthy School'.

The future development of standards for learning outcomes for SGD 3 and SGD 8 is therefore very important for mainstreaming OSH into education. Similarly, the current evolution of the ESD program draws attention to the need to re-establish the beginnings of a policy-oriented approach to mainstreaming OSH into education. This applies to the activities of EU-OSHA between 2002 and 2006, as well as to the activities of the International Social Security Association (ISSA) Section on Education and Training for

Prevention between 2000 and 2010, which also involved developing countries.

Networking

More than half of the examples of good practice in the ENETOSH database mentioned networking across all levels of the education system. Networking often involved the exchange of information and experiences (61%); there were few examples in the database of networking for strategic purposes (7%).

Assuming that networking is a new mode of interacting and communicating, it is imperative that safety and health be integrated into the new learning and education space of the Internet. In addition, a recent ILO study on networking in safety and health has revealed that there will be a need in the future to systematically network OSH institutions and professional networks. The topic of OSH education and training was present in the programmes of most of the 78 OSH institutions that were surveyed worldwide. However, the institutions have more contact with international or regional organisations such as WHO, the ILO, EU-OSHA and ENETOSH than bilateral contact or contact with other professional networks (Lehtinen 2018).

Good models for good practice

This study not only improves access to the good-practice examples in the ENETOSH database, it has also identified eight models of good practice.

The basis for the models were those examples of good practice from the sample which

had the highest prevalence of each key element and those selected by the focus group for an interview. At least two interviews were conducted for each key element.

The following are the good models for integrating safety and health into education:

I. The In-Practice Model: hands-on experience with workplace safety and health
II. The Responsibility Model: safety and health are everyone's concern
III. The School Development Model: using safety and health to make good schools
IV. The Active Citizenship Model: the intergenerational dialogue
V. The Cross-Sector Model: involve multiple stakeholders from OSH and education
VI. Sustainable Project Management in OSH Education
VII. The Support Network: connecting people
VIII. The Collaboration Network: strategically build and use networks

The purpose of these good models is to guide good practice. Only two of these models have been scientifically evaluated (III and IV), which corresponds to the small proportion of evaluation found in the examples of good practice. However, scientific proof of the 'evidence' of these models says little about their ability to be put into practice. In the future, research on implementation will be needed to document the process of implementing these models and to link this with the results of an efficacy evaluation.

Trends

Three trends are emerging for integrating safety and health into education:

1. a political-strategic revival of mainstreaming OSH into education in the context of implementing Sustainable Development Goals;
2. targeted implementation of good models for good practice such as the 'Good Healthy School' and 'Intergenerational Learning' in an international context, taking into account the digital learning and education space; and
3. systematic monitoring of the implementation of good models for integrating safety and health into education through research on implementation.

The results of this study will soon be distributed within the ENETOSH network, at international congresses, through partner networks and with the support of the British Safety Council, EU-OSHA and ILO.

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6 Annexes

6.1 Annex I – Classification system

Element	Description	Rating
Participation	Participation means including people in the development and decision-making processes that affect OSH issues within an organisation and its social environment at the earliest possible stage and across all phases of life.	• 0: No information • 1: Teamwork of all participants • 2: Different groups of people are involved in the process • 3: People actively participate in overall planning, implementation and the decision-making process
Empowerment	Empowerment makes you and others 'strong'. Over the long term, empowerment leads to personal growth and strengthens the social environment and the organisation. Empowerment promotes safety and health and is one of the prerequisites for developing a culture of prevention.	• 0: No information • 1: Instruction about safety and health increases knowledge and competences • 2: The learning and working environment enables the development of skills and competences • 3: The development of skills and competences in safety and health is based on self-determined, autonomous action
Sustainability	Integrating safety and health into education is sustainable if it enables people to think and act in a sustainable way, when it is done across all stages of life and learning, and when it contributes to the development of a sustainable culture of prevention.	• 0: No information • 1: Individuals acquire competences to be able to cope with challenges • 2: The creation of an institutional framework supports OSH education • 3: Safety and health are principles of the organisation (integral part of leadership, the organisational development, related to the quality of education)

Element	Description	Rating
Networking	Networking is about relationships between people and organisations. Specifically, about networking of people and organisations from the policy areas of OSH and education. Networks and networking represent a new mode of interacting and communicating in times of digital and global transformation.	• 0: No information • 1: Exchange of information & experience, and mutual support between those who are responsible for safety and health and education • 2: Cooperation across groups and institutions from different policy areas (e.g. OSH institutions, health insurance providers, local community forums) • 3: Networking as a strategic alliance: formation of sustainable, comprehensive, cross-cutting measures
Focus on target groups	The term 'target group' is ambivalent. It is used in this study under the following conditions: the target group is clearly described, the target group is fully involved, or the demands and needs of the target group are taken into consideration.	• 0: No information • 1: Target group is clearly described • 2: The target group is actively involved • 3: The measures are based on the demands and needs of the target group
Evaluation	Evaluation refers here to both evaluation of the results (summative) and evaluation of the processes (formative).	• 0: No information • 1: Documentation of results • 2: Evaluation of results: analysis of success factors and barriers • 3: Evaluation of results and processes

Element	Description	Rating
Classic prevention approach	A classic approach to prevention includes both behavioural prevention and settings-based prevention.	• 0: No information • 1: Focus on behaviour • 2: Focus on organisational development • 3: The individual and structural approach are linked together
Comprehensive prevention approach	A comprehensive prevention approach goes beyond the classic approach to prevention which focuses solely on risks. It not only involves the prevention of work-related accidents and diseases, but also promotes a complete physical mental and social well-being in the workplace. When safety and health are an integral part of an organisation's culture, one speaks today of a culture of prevention.	• 0: No information • 1: The aspect of culture is considered (e.g. school culture, organisational culture within a company) • 2: A connection between safety and health and the organisational culture is made/considered • 3: Safety and health are an integral part of daily life (e.g. in a school or company) (Culture of Prevention)

6.2 Annex II – Interview guideline

Heading

- Name/institution
- Project name and duration
- Promoted by?
- What was/is your role in the project(s)?
- How are/were you involved in the project(s)?

Participation

- What does participation mean to you?
- What is the connection between empowerment and participation?
- Which people and institutions are involved in your project?
- How do you manage to actively involve people?
- In which parts of the project(s) did the people actively participate?
- How can you see in the results of the project(s), that people actively participated?
- Which competences are necessary to actively participate?
- Which competences are necessary to participate actively in safety and health?
- What frame conditions are necessary for people to actively participate?
- How do you convince people to actively participate?
- How do you deal with dis-engagement? (voice behaviour – being afraid to say something; silent behaviour – people gave up)

Empowerment

- What does empowerment mean to you?
- What is the connection between empowerment and participation?
- What is the role of self-organised learning for empowerment?
- What does competence in safety and health imply?
- Which competences are necessary to actively support safety and health?
- Which methods do you recommend for helping people to discover and develop their own abilities?
- How do you support an autonomous/self-organised approach to safety and health?
- Empowerment has something to do with educational opportunities. How do you take into consideration the heterogeneity of the participants in your project?
- How do the participants actively participate in your project?
- How do you find the right balance between aspiration and reality?
- Do you know of any methods and tools to measure empowerment in safety and health?

Sustainability

- What does sustainability mean to you?
- How do you measure sustainability?
- What kind of new things emerged from your project(s)?
- How do the participants apply the results of the project(s)?
- In which way have the findings and results of your project(s) been used further?
- Did your project(s) have an impact on the creation of safe and healthy workplaces and the learning environment?
- Does your project(s) have an impact on people who haven't been directly involved?
- If you disregard your good-practice example and the fact that mainstreaming OSH into education demands a great deal of the education system, what do you think or know about the reality in the education system?

Networking

- What does networking mean to you?
- How important is networking between safety and health on the one hand and the area of education on the other hand?
- Which people or institutions are the most important partners to have for a project on safety and health in the area of education?
- What are the main characteristics and functions of networking?
- What does quality of networking mean to you?
- How do you apply strategic networking?
- How do you use networking in your project(s)?
- Which examples for successful networking do you know (particularly in the area safety & health and education)?
- What are the most successful forms and methods of networking?
- How important is networking for safety and health?
- How important is networking in constantly changing working environments (4th industrial revolution)?