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3. HOW TO ATTRACT THE NEW GENERATION
4. HUMAN FACTORS
5. INTERNATIONALISATION
6. CHALLENGING MINDSETS
7. DIGITALISATION
8. MANAGEMENT DEVELOPMENT CYCLE
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1.

About the author

Name Angel Crescencio Martínez Ortiz

Position Human Factor Training Coordinator

Company Adif

Email amartinezortiz@adif.es

Telephone 647999664

Abstract

Title

HUMAN FACTOR PROSPECTIVE TRAINING

List the key lessons or learning point that delegates will take away from the conference

Human factor errors, Cognitive skills training, Mindfulness training (in order to improve worker’s perceptive situational awareness).

Abstract in English (no more than 500 words)

Most of current studies regarding the causes of major industry accidents reveal that about 80% of such, are due to human factor issues. To be more accurate, within the railway sector, the UIC reveals that 77,7% of all accidents’ inner causes involve human factor matters.

On the other hand, human factor taxonomic models have been applied in the railways. Results obtained show that main human factor errors are involved with those errors regarding other skills but technical ones. Last report from CIAF (Comission of Railway Accidents Investigation), shows that lack of attention and perception are among the most relevant skills. Other studies join such report.

This essay nourishes from Reason’s 1990 and Rasmussen’s 1983 error theories. The concept of “situational awareness” (Endlsey. M ; 1995), pretends to show a prospective training method based on the development of situations with a high potential risk accident. This training uses skills that are not technical skills. It values a risk prevention culture based on the prevention of such unsafe acts that relate to a perceptive situational awareness.
These studies focus on the most common railway accidents between its professionals. They have led us to set one training plan about non technical skills. In doing so, we have met two training branches:

- **Cognitive skills training**:
  - By using scientific validated software that makes measurements with high accuracy and it stimulates all cognitive skills.
  - Using mindfulness training in order to improve our perceptive situational awareness.

- **Prospective training**: It deeply analyses all accidents and near-misses.
  - Using personal experiences told or recorded on video by railway workers whether these experiences are real or potential risk situations.

- **HFSCA methodology** analyses these cases. When an event is analysed thoroughly, an important amount of knowledge emerges. Working on such field is nothing but an interesting step towards progress. This study turns into a usual practice. All elements that have led to the accident are examined in an organised way in order to discover its causes, development and real or potential consequences.

The objective of this study is always understanding in order to act. This means:

- Going far beyond the apparent causes (human error, faulty equipment), in order to identify deeper causes leading to the accident.
- Share these studies so that all people involved are aware of the mechanisms of the identified weaknesses, whether these are human, technical or organizational weaknesses.

**WCRT Topics addressed in paper, First Topic**

Human factors and training

**Optional Second Topic**

Safety risk culture (personnel & customer safety/railway safety)
About the author

Name
CHINJU CHEN

Position
Assistant Manager

Company
Taiwan High Speed Rail Corporation

Email
angus_chen@thsrtc.com.tw

Telephone
+886 3 2623000 # 29158

Abstract

Title
How does Taiwan High Speed Rail Corporation Attract the New Generation to the Railway Sector

List the key lessons or learning point that delegates will take away from the conference

The delegates will know how Taiwan High Speed Rail Corporation attracts the new generation to join and work for the company by (1) Utilize Technology to develop Smart Employer Brand (2) Integrate Internal Resources to lunch Educational Activities and (3) Collaborate with Universities to introduce Internship Programs.

Abstract in English (no more than 500 words)

According to the statistic data of Taiwan High Speed Rail Corporation (THSRC), the average age of the employee from 2015 to 2017 is 36.5. Compared to the figure of the other railway companies such as Taiwan Railway Authority (TRA) 44.5 and Deutsche Bahn (DB) 46, THSRC is still a young company. In fact THSRC, a private owned company, was set up in 1998, and started operation in 2007.

As most of railway companies are facing the generational alternation issue, even though THSRC is quite a young child, the company cannot stay out of the way. It is thus essential for
THSRC to start action as early as possible on how to attract the new generation to join and work for the company or perhaps the other railway sectors in Taiwan.

Members of new generation grew up in technology, and they pursue a better work/life balance, in order to attract them to railway sector, the key point is “well utilize the technology to make them like the company first then try to let them know and understand the company.” THSRC thus has adopted several strategies from 2011 including: (1) Utilize Technology to develop Smart Employer Brand (2) Integrate Internal Resources to lunch Educational Activities and (3) Collaborate with Universities to introduce Internship Programs.

THSRC has been selected by the new generation as top 3 dream jobs in transportation category for the past three years. The company, as a result, do attract more and more new generations, however, the turnover rate is also high for this particular group of people. It means THSRC has to provide more incentives to let them stay and work for the company. This might be the next issue that the company can work on with.

**WCRT Topics addressed in paper, First Topic**

How do you attract the new generation to the railway sector through collaboration with colleges and universities

**Optional Second Topic**

*Sans réponse*
Abstract

Title

BEST PRACTICES ON RAILWAY TECHNICAL TRAINING. WHAT’S NEXT? : IMMERSIVE LEARNING

List the key lessons or learning point that delegates will take away from the conference

In this paper, we can find a roadmap from HW kits to SW and VR simulation, based on a case study for assembly and maintenance procedures on railway energy systems. We’ll see the new “immersive classroom” concept. It allows multipurpose training and assessment activities with integration of multimedia, 2D&3D and VR software simulations. An hour spent in immersive classroom is more productive than an hour spent using traditional methods. This means it is possible to train more people in less time and better conditions.

We will analyse application and implementation criteria, best practices, and finally, future trends. Moreover, the powerpoint presentation will include a comprehensive brief of the paper with screenshots and videos of 2D&3D software and VR simulations running in our immersive classroom.
Good designing of training paths for learning and assessment of technical skills is critical to ensure high quality execution on railway construction and maintenance operations according to updated procedures, standards and rules.

Since 2005, ADIF has training and certification programs, organized in groups of about 12 students and scheduled on three main blocks during three months:

- Asynchronous learning. Previous basic online training module based on e-learning SCORM-compatible multimedia content, video clips, 2D&3D simulators, virtual labs and test exams.
- Synchronous learning. Classroom or tele-presence sessions combined with practical indoor and outdoor labs at ADIF’s Technological Training Centre (ATTC), based on railway hardware equipment and specific software simulators.
- Practical learning. On the job training, where trainees execute procedures supported by a senior worker, write a report and send it to ATTC for final validation and certification.

Nowadays however, we have new issues to be addressed. Due to ADIF’s ageing workforce, year by year, we have to recruit new young workers, preceded always by an internal human resources reordering process. This means we must deploy each year in a short time, two additional special technical training programs for many people and larger groups (25-30 students). Then, we must train more people and reduce the duration of our standard training and certification program from 3 months to 2 months, while we maintain high quality level on training and effectiveness of knowledge transfer.

Therefore, we need to add some innovation step on the training program to improve efficiency and make learning curve faster. Thanks to technology evolution, we found it two years ago: virtual reality (VR).

Since 2017, we have added a new immersive learning block based on VR portable kits, for improving knowledge transfer and evaluating technical and non-technical skills in closer conditions to real world, before on the job practical training block. VR is a very suitable technology to simulate whole railway infrastructure scenarios and allow trainees directly living active and collaborative experiences.

Now, in 2018, we have at ATTC a new immersive classroom with a special design to allow multipurpose training and assessment activities with integration of multimedia, 2D&3D and VR software simulations. It allows trainees to put what they’ve learned into practice, thanks to a fully seamless immersive experience on non-hazardous virtual railway environments with enhanced features:

- High quality 3D simulations with multi sensorial perception (audio, video, touch,...). VR
Headset or multiple projector output devices (three walls and floor).

- More direct and intuitive interaction through leap motion, without typical computer input devices (keyboard, mouse, joystick,...) used on standard software simulations.
- Dynamic configuration by instructors of standard and abnormal work conditions loaded from XML file, to assess trainee reaction in real time.
- Live session broadcast and multiple sources mixing and recording for video clip production or subsequent discussion and analysis.

After several training programs using immersive classroom, we have obtained excellent results: more motivation for centennials, better comprehension and solid knowledge, customized learning or assessment, zero accidents, cost efficiency in classroom and practical training.

**WCRT Topics addressed in paper, First Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc

**Optional Second Topic**

Cost efficiency in training
5.

About the author

Name
Franz Reisinger

Position
Senior Consultant

Company
Deutsche Bahn AG, DB Training, Learning & Consulting

Email
franz.reisinger@deutschebahn.com

Telephone
004916097470464

Abstract

Title
Compilation of a Railway Specific Vocational Educational for young Emiratis

List the key lessons or learning point that delegates will take away from the conference

Delegates will get to know the approach and implementation of culture and costumer oriented railway specific vocational educational qualification as a new qualification approach and how the implementation in cooperation with international partners succeeded.

Abstract in English (no more than 500 words)

Rail transport is a growing global market, in high-speed and freight, suburban, light rail; subway and tram services. One of the key challenges in this worldwide growing market is the qualification of personnel to handle the traffic in a safe and customer-oriented way. Amongst other functions possible train drivers, dispatchers and maintenance personnel of vehicle and infrastructure have not only to be recruited but qualified and assessed as well. The challenge increases in countries without a railway or where working for a railway has a low status. In such countries to develop and implement marketing strategies is essential to identify applicants who can contribute value to the railway undertaking or railway infrastructure.
provider.

Short, function-related trainings as known within e.g. the German Railway are often not sufficient as the participants need basic technical knowledge that is not provided in local schools, e.g. basic knowledge in electrics, electronics, mechanics, track construction etc. One of the challenges is to conceive training plans covering the necessary basic knowledge plus the railway specific knowledge, taking in consideration the qualification standard and learning behavior of the students.

The other challenge is to transfer the knowledge in a methodical way which is exciting for the students and encourages them to finish the qualification measures taking in consideration their cultural background and learning abilities.

Stakeholders who must or can contribute to the success of the program must be identified and involved as well to ensure the success of the program. Apart from the company and the several stake holders within the company and the customers of the company that can be local authorities, schools, local training providers, parents and the students their selves.

The participants of the 5th World Congress on Rail Training “Unite-Inspire-Connect” which will take place in Rabat, Morocco, on 09-11 October 2019. UIC in Rabat, learn by means of a concrete example:

- The holistic approach to such a challenge
- The involvement and the contribution of the stakeholders
- The creation of the training plans in a blended learning concept
- The cooperation with local and foreign training providers
- The implementation of the training program
- The supervision of the program and of the students by the railway undertaking
- The increase of the companies effectiveness

**WCRT Topics addressed in paper, First Topic**

International co-operation between companies

**Optional Second Topic**

How do you attract the new generation to the railway sector through collaboration with colleges and universities
6.

About the author

Name
Marquet Audrey

Position
PHD

Company
SNCF

Email
audrey.marquet@sncf.fr

Telephone
0634362960

Abstract

Title
The professionalization: proceeds and lever of safety culture

List the key lessons or learning point that delegates will take away from the conference
Professionalization, Safety

Abstract in English (no more than 500 words)

SNCF is part of an organizational trend promoting a culture of "integrated safety" considered as a guarantee of enhanced reliability of technical social systems. The professionalization process is seen as one of the levers for supporting the migration to this culture. The two studies of the thesis aim: 1) to explore the leverages and impediments of a professionalization to an integrated safety; 2) to identify the professionalization initiatives to safety and to understand how the prescribed and the expected in safety are mobilized in the work.

In this research, we considered that safety professionalization and safety missions are a product of « safety culture », and that the selected safety model influences the actor’s missions. The contents of safety missions and of the professionalization in production and in training are written by specialists claiming expertise, and are not in adequation with the real
workplace. In fact, safety culture is shaped by the professional skills and expertise. Safety should be integrated to the whole organization. With this in mind, two types of safety professionalization initiatives are identified: 1) the primary goal is the learning of the safety dimensions of jobs; 2) the primary goal is production in safety, with a reflexive dimension for the development of safety skills.

The general theoretical framework of the thesis joins constructive ergonomics and professional didactics, which mobilize the concept of “activity”.

This communication aims to show how the first and second study are articulated, meaning establishing a link between the expert’s perception (HOF, Safety, Training) on the current practice and the practice in the real workplace.

Concerning the investigative methodology of the study 1, the data are collected in three establishments. 24 semi-structured interviews were conducted with 24 experts who have a strong experience and knowledge in their domain. A thematic analysis was conducted. For the study 2, in progress, the field of investigation concerns: 1) the production with signalmen and station managers; 2) the training with trainers and trainees of these two jobs. For implementing this study, semi-structured interviews and observations of the activity are being conducted. An analysis of the activity was realized.

The results showed that the safety model is considered by the experts like rule-based, influencing safety missions and the professionalization. Safety missions are considered by experts as centred on the respect of the prescription for the operational staff and their managers, and for the training actors. The professionalization initiatives are grounded on the respect of the prescription, and do not take into account the necessary adjustments in real work situations. Well, in the real workplace the operators adapt to disrupt situations. For developing safety skills, several professionalization initiatives to safety are favourable or not favourable. Thus, the experts propose levers as an increase of practice in training, in order to tend toward an “integrated safety”.

These studies underline the gap to be filled between the company’s desire to establish an integrated safety culture and the current experts’ perception of the real workplace.

**WCRT Topics addressed in paper, First Topic**

Human factors and training

**Optional Second Topic**

*Sans réponse*
7.

About the author

Name
Annalena Bottmann

Position
Consultant

Company
Deutsche Bahn, DB Training

Email
annalena.bottmann@deutschebahn.com

Telephone
004915237553112

Abstract

Title
We wait for people to get sick before we teach them valuable resiliency skills. Let’s teach them early so they stay healthy. The idea of PowerUP ! – The mental gym.

List the key lessons or learning point that delegates will take away from the conference
We can give employees sustainable means to build resiliency early instead of curing them after painful mental crises.

Abstract (no more than 500 words)
In a time of rising VUCA working conditions employees are increasingly stressed by managing all requirements of their ambitious everyday work life. In consequence, numbers of employees on mental sick leave are constantly rising, taking their toll on employee well-being and the employers budget. Finding treatment for mental ailments is time-consuming and arduous for those affected. When people finally receive the treatment needed, they are often taught efficient techniques to get better. In a sense, we wait for people to get sick before we provide them with the cure to get well again. Why not give them early “vaccinations” instead of a longsome cure? Why not teach them how to stay healthy instead of teaching them how to get back to health after suffering?
PowerUP! is a preventive training tool to build resiliency and psychological well-being, boosting users mental health way before rough times appear and take their toll on them. It is presented in as an app to be able to offer its benefits to all employees, regardless of work schedule or travel times. Traditional trainings setting can systematically exclude railway staff and shift workers from participation because they simply cannot be excused from work as easily. This is problematic because these are target groups with additional stressors who therefore are in special need of support. An app is accessible at any time, in any place – thus including all employee groups and making participation possible for everyone.

Additionally to classic resiliency content such as stress management and relaxation techniques PowerUP! also offers courses derived from Positive Psychology such as the training of optimism and findings from Cognitive-Behavioral Therapy such as reduction of stress-increasing thoughts. PowerUP! offers this wide variety of topics to give each user the chance to find the right course for themselves. The app helps build healthy habits to protect the user every day. Within each topic the app gives basic information, as to why a subject is relevant to mental well-being, a day to reflect on one’s own status on the matter and an accompanied phase of practice, in which the user does small every day exercises which eventually become habits. To address the fact that forming a new, healthy habit can be hard for adults the app uses gamification and active motivation to help the user achieve his / her goal. Additional to this primary prevention PowerUP! also offers helpful tips on how to quickly get appropriate help if a crisis does present itself. To also cater to railway staff needs specifically the app also provides practical advice and exercises on how to incorporate shift work and customer service into work life in a healthy and sustainable way. PowerUP! is a strong and innovative tool to efficiently empower employees early in an increasingly demanding working world.

Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

New challenges, such as cross-cultural, inter-generational

Optional Second Topic

Sans réponse
8.
9.

About the author

Name
Tony Mildred

Position
Business Unit Manager - Training and eLearning Sydac

Company
OKTAL SYDAC

Email
tony.mildred@sydac.com

Telephone
+61413442489

Abstract

Title
Eyes Wide Shut – Running head-long into virtual reality learning

List the key lessons or learning point that delegates will take away from the conference

Does VR and or AR assist with learning?
Where will VR and AR most suit rail industry training programs?
What role does learner motivation play in the effectiveness of VR or AR?
What pedagogical frameworks are appropriate for VR and AR?

Abstract in English (no more than 500 words)

As the costs associated with Virtual Reality (VR) and Augmented Reality (AR) technology have reduced, they have become attractive for training in many fields over the past few years. This trend is also reflected in our industry where they and are increasingly being sought by rail training departments. But what do we really understand about the pedagogical efficacy of VR and AR as training media?
The novelty value of VR and AR plays some role in the attractiveness and, as we shall see, this can have some flow-on into the effectiveness of learning. The cost and availability of VR and AR technology have significantly reduced. However, the future success of the medium is
analogous to the pay TV or entertainment streaming services. Without the development of high quality content AR and VR technologies will remain a novelty. There is a risk that after an initial burst of activity the longer term effective use of the technology will not be continued without a valid pedagogical framework and skill development for trainers. Most rail organisations will rely on external developers for content generation who will be expert in the needs of the technology but may not be expert in the needs of the learner and will almost certainly not possess railway expertise. To develop high quality learning content for VR and AR media, we need to understand what learning methods are most suited to the media.

This paper will examine the peer reviewed educational research regarding the effective use of VR and AR for education of adults in technical and operational fields and provide a pedagogical approach for the inclusion of these technologies into rail training.

The paper will address the following questions:
- Does VR and or AR assist with learning?
- Where will VR and AR most suit rail industry training programs?
- What role does learner motivation play in the effectiveness of VR or AR?
- What pedagogical frameworks are appropriate for VR and AR?

**WCRT Topics addressed in paper, First Topic**

Digitalization of training & learning solutions (including social media): success stories

**Optional Second Topic**

Training design
10.

About the author

Name
Doreen Christmann / Heiko Scholz

Position
Business Consultant HR and Training / Director DB Rail Academies

Company
DB Engineering & Consulting GmbH

Email
doreen.christmann@deutschebahn.com

Telephone
015142122494

Abstract

Title
New recruiting channels – attracting millennials with innovative digital formats

List the key lessons or learning point that delegates will take away from the conference

- Overview of various digital learning formats that are used at Deutsche Bahn
- The necessity and relevance of using new recruiting channels and formats for attracting millennials according to clash of companies and ongoing lack of specialists
- Understanding the needs of millennials and implementation of new requirements
- Impacts on recruiting and samples of how Deutsche Bahn changed its recruiting

Abstract in English (no more than 500 words)

Through technological innovation and the associated strong penetration of areas of life individuals into, companies are challenging to keep up with trends and meet the growing technology needs of younger people.

In particular, Millennials have a high demand on the use of digital media. Mobile phones are nowadays cross- and multifunctional devices, replacing the stationary PC and are now the everyday companion. This has a clearly impact on the professional life and workplace. The requirements for employers are changing. Only employers with a diversified and continuous
use of digital media portfolio are considered to be an attractive one. The recruitment of new employees in the age of persistent skills shortage requires not only the image of a modern, innovative employer, but also authentic and digital recruitment channels with little effort are needed. Recruiting But only innovative forms of recruitment are not enough - onboarding, education and training must be at least equal to or better. With Virtual and Augmented Reality, Deutsche Bahn offers tangible insights into concrete occupations at career information fairs in schools, universities, etc. Simulated experiences and the concrete insights in workplace of professions help the potential applicants to simplify the decision to work at Deutsche Bahn. But the application processes have also changed at Deutsche Bahn. Paperless, fast and uncomplicated: applications can be uploaded directly with mobile apps, as a classic document or as a video message. Working with different start-ups, both internally and externally, new ideas for applications and processes can be incorporated and quickly made available.

**WCRT Topics addressed in paper, First Topic**

How do you attract the new generation to the railway sector through collaboration with colleges and universities

**Optional Second Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management,
11.

About the author

Name
Xinling
Position
Deputy Dean of School of Distance and Continuing Education of Southwest Jiaotong University, China.
Company
Southwest Jiaotong University
Email
xinling@swjtu.edu.cn
Telephone
+86 13608087108

Abstract

Title
Digitalization of Railway Training & Learning Solutions : Practice in SWJTU

List the key lessons or learning point that delegates will take away from the conference
1. The practice of combining on-line and off-line education in railway section.
2. The hardware and software needed for onl-line and off-line education in railway section.

Abstract in English (no more than 500 words)

Distance education is showing its advantages in railway training sector. A combination of the on-line and off-line education is introduced to provide an easier way of learning as neither mode of education itself can meet the needs of training for core jobs in railway that requires both theoretical and practical capacities. The combination is widely used in Southwest Jiaotong University for both degree & diploma education and training programs. This blended mode enables Southwest Jiaotong University to successfully cultivate more than 30,000 trainees per year domestically and internationally, and the training programs receive positive feedback from the trainees, the clients and Ministry of Commerce, etc.

The main objective of this combination mode is to achieve distance education in the railway sector and provide a digitalized solution for those who would like to further their education
but have time or financial constraints. Based on the system developed by our university, we are able to put more emphasis on learner autonomy and openness to all learners; learners are free to choose when to learn, where to learn, how to learn and what to learn in accordance with their own needs, thus boosting learners’ motivation and satisfying needs for the life-long learning.

The blended mode effectively made up for the weakness of either online or offline study alone. For offline study, we have established study centers around the country. The centers offer face-to-face lectures and Q&As given by professors and lecturers, and trainees will have opportunities to visit and practice in key laboratories, enterprises and allied units.

For online study, we devote a lot on software. We have deliberately developed courses for online study. Up to now, SWJTU has developed resources of more than 400 courses’. Taking high-quality courses as the core, together with diverse teaching resources, the integrated teaching resources system has been well established. What’s more, we have developed a comprehensive learning system for students including course learning website, student enquiry and application platform, teaching platform, course performance evaluation system, online examination platform, supportive service platform and data platform and other subsystems, covering the whole learning process. We also equipped the system with sections for interaction between teachers and students. Tutoring teachers are employed to answer questions online for courses.

For hardware, SWJTU has invested more than 15 million RMB to establish our own Cloud Computing Center and has updated the equipment by replacing core exchange equipment, large-capacity UPS and centralized storage devices. The well-established, enterprise-level private cloud platform is used in our system. The technology of cluster and load balance is employed to virtualize node servers and internet so that hundreds of virtual servers can be virtualized with only 20 physical servers. To make study accessible for fragmented time, SWJTU designed and introduced the mobile learning solution — “Qingshu PAD”, which is a new learning method combining the online and offline learning resolving the conflict between work and learning.

WCRT Topics addressed in paper, First Topic
Digitalization of training & learning solutions (including social media): success stories

Optional Second Topic
Sans réponse
12.

About the author

Name
Shi Lei

Position
Engineer

Company
Southwest Jiaotong University

Email
sl514@qq.com

Telephone
Sans réponse

Abstract

Title
Evaluation and Training System of Operational Safety and Adaptability for High-speed Train Dispatchers

List the key lessons or learning point that delegates will take away from the conference

3. The Application of The System

Abstract in English (no more than 500 words)

The safety and reliability of dispatchers directly affect the operation efficiency and safety of railway system. According to the actual railway operation and adopting the international standard cognitive psychology method, the team independently researched and developed the safety adaptability evaluation and training system for high speed dispatchers and normal speed railway from three aspects: psychological quality, basic cognitive ability and emergency handling ability.
In order to better integrate the actual railway work, and ensure that the system is scientific and practical, the team preliminarily determined high-speed railway dispatchers’ selection and regular evaluation indicators by researching several local railway bureau dispatching offices and making a deep Analysis of dispatchers’ operation process and requirements. Afterwards, the psychological and behavioral data of more than 350 dispatchers were collected and analyzed, and 5 psychological qualities and 13 basic cognitive abilities were determined by comparing the data of the excellent job performance group and the control group of the on-the-job dispatchers. Aiming at the evaluation and training of dispatcher’s emergency handling ability, the author developed “Normal Speed Railway Dispatching Simulation Platform” and “High-speed Railway Dispatching Simulation Platform”, where 40 kinds of normal speed railway and 52 kinds of high-speed railway emergency scenes are embedded.

The system can fulfill the following functions: First, the selection of new dispatchers; Second, regular evaluation of the on-the-job dispatchers; Third, operational safety training.

WCRT Topics addressed in paper, First Topic

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc

Optional Second Topic

Sans réponse
13.

About the author

Name
Doreen Christmann / Heiko Scholz

Position
Business Consultant HR and Training / Director DB Rail Academies

Company
DB Engineering & Consulting GmbH

Email
doreen.christmann@deutschebahn.com

Telephone
015142122494

Abstract

Title
Innovative learning formats – how Deutsche Bahn diversified the learning environment by the use of new digital learning formats

List the key lessons or learning point that delegates will take away from the conference

- Overview of various digital learning formats that are used at Deutsche Bahn
- Blended-Learning is still relevant but is enriched with new learning formats
- Insights of concrete applications
- possibly experiencing of digital learning formats: AR and VR training software
- challenges by development, implementation and usage of new formats

Abstract in English (no more than 500 words)

The rapid development cycle of software programs, the penetration of technologies in our areas of life and the quick availability of information affecting learning behaviors as well as learning environments. In today’s knowledge-based society, companies are being challenged to become learning organizations and to implement the trends quickly. If companies do not undergo or refuse to embrace this change, they will lose the battle for skilled labor and will no longer be competitive.
Many organizations as well as the Deutsche Bahn have for many years already replaced pure frontal training by the enrichment of other formats such as practical training, self-learning units and social learning forms: blended learning is therefore not a new phenomenon. But blended learning is further diversified through the variety of technology developments. There are various learning formats and methods. The spectrum expands, the possibilities of training design grow and the fun of learning increases.

At Deutsche Bahn, through insourcing and outsourcing of knowledge as well as cooperation with start-ups, tangible digital learning formats are already being used successfully.

Application examples:
- Presence learning becomes virtual: the virtual classroom through VR
- Learn action security through VR
- Maintenance for laymen by means of AR
- eBooks were yesterday - today specialist literature is developed interactively
- and much more.

As a large and international mobility company, Deutsche Bahn has expanded existing training programs with the use of new technology, enriched its portfolio and introduced completely new forms of training. Practical trainings are enhanced by simulations and virtual environments. Particularly in the safety-relevant professions in the railway sector, such as the control and safety technician, track-builder and maintenance engineer, mistakes can be made and actions and skills can be practiced without impacts on the learner itself. Practice facilities such as operating areas are therefore also less burdened if previous practical training is simulated in training rooms.

**WCRT Topics addressed in paper, First Topic**

Digitalization of training & learning solutions (including social media): success stories

**Optional Second Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc
14.

About the author

Name
XIAONING ZHU

Position
Professor

Company
Beijing Jiaotong University

Email
xnzhu@bjtu.edu.cn; gangwang@bjtu.edu.cn

Telephone
+861051685418; +861051685456

Abstract

Title
Practice and Thoughts on the International Development of Technical Education and Training in Railway Colleges and Universities

- List the key lessons or learning point that delegates will take away from the conference:
  1. Railway technical education and training, as an important part of international railway cooperation, has also ushered in a new opportunity.
  2. Colleges and universities own absolute advantages in railway international education and training.
  3. Internationalization of railway training will definitely have a positive impact on the building of social civilization, and thus promote social progress and human civilization.

- Abstract:
  In recent years, the development of railways around the world shows new features such as rapid technological innovation, fast development in scale, and close exchanges and cooperation. Such rapid development requires the support of education and training. Amid this backdrop, colleges and universities having absolute advantage in railway science and technology popularize and arrange trainings in international railway technology on the basis of existing experience and advantages to provide intelligence, technology and talents for the development of world railways, which will play an important role and be of great significance in promoting the healthy,
rapid and sustainable development of the world railway industry, and even the development of railway civilization and social civilization.

- **WCRT Topics addressed in paper, First Topic**
  International co-operation between companies

- **Optional Second Topic:**
  Training supporting sustainable development
15.

About the author

Name
Doreen Christmann / Izzat Dabbagh / Heiko Scholz

Position
Business Consultant HR and Training / Director DB Rail Academies

Company
DB Engineering & Consulting GmbH

Email
doreen.christmann@deutschebahn.com

Telephone
015142122494

Abstract

Title
Management & Leadership in the Railway Sector – Facing the Importance of the Changes in Training Programs

List the key lessons or learning point that delegates will take away from the conference
- Relevance of management programs for the railway sector
- Understanding the necessity of a change of subjects within management programs
- Best-Practices of how Deutsche Bahn developed international management and leadership programs

Abstract in English (no more than 500 words)
The importance of lifelong learning, and thus continuing education and skills enhancement, has already arrived in society and in business today. It is not just about the mass of the workforce, or the maintenance of knowledge within an organization, but also about the responsibility of the continuous process. Education therefore not only affects a specific target group in a company, but affects all stakeholders. Managers bear a great responsibility in the implementation of the learning culture as well as in the maintenance of those. It is not just about the development of executives skills such as how do I lead employees, which
management methods are efficient and how do I lead critical discussions. The competences of the manager will and must also be more interdisciplinary.

Especially in the railway sector, management competence alone is no longer sufficient. For example, if an executive wants to lower maintenance costs, then they must know and understand the maintenance process. Technical skills or at least technical understanding of the interdependency, interfaces and influencing factors play an important role. Existing managers as well as potential executives therefore need to be trained not only in soft and business skills, but also in the entire rail system. For this purpose, Deutsche Bahn has developed international training programs for worldwide partners in order to build their management team differently for taking over responsibility in the railway sector.

In Brazil, there has been a comprehensive and demanding further education program since 2018, which lasts 18 months and is offered on a part-time basis. Executives and those who want to become one are trained in four technical and three non-technical subject areas. In addition to face-to-face training of 40 study hours in a week, the 35 participants will have to solve preparation tasks for the respective modules, such as preliminary studies, reading of specialist literature and to do follow-up tasks according to the respective modules, such as project work and case studies. This achieves a strong technical depth, giving participants a comprehensive and detailed insight into all relevant topics:

- Rail Operations
- Rail Systems
- Rolling Stock & Maintenance
- Infrastructure & Maintenance
- Business Skills & Ergonomics
- Management & Leadership
- Economics

The management program not only serves the participants for personal further education, but also enables an unprecedented networking of the sector. You get to know each other, you learn together and you work together on projects that are very important for the entire railway sector.

But there are other ways in which managers can be prepared for their role in the railway sector. In Dubai, for example, Deutsche Bahn has introduced another form of executive development. There are two directions of development that determine the focus and possibly the later position. The horizontal development path offers the opportunity to gain a comprehensive insight into the most important technical topics in order to meet a more generalist position. In addition, the vertical direction offers a deepening and specialization in a specific field. Previous knowledge will be assessed before participation that will determine
the entry level as well as the individual duration of the program. The deepening of leadership skills, however, is mandatory for both development paths.

- Transportation Systems
- Vehicle Engineering & Operations
- Infrastructure
- Leadership & Management

Although for executives the technical level is more based on a fundamental level, this is necessary to ensure a safe, reliable and efficient rail business.

**WCRT Topics addressed in paper, First Topic**

Management and leadership development

**Optional Second Topic**

Human factors and training
16.

About the author

Name
THERET Caroline

Position
Directrice de l’Ecole Nationale des Compétences Traction pour les Managers

Company
SNCF

Email
caroline.theret@sncf.fr

Telephone
+33619284640

Abstract

Title
Le dispositif Ascension Manager (blended learning)

List the key lessons or learning point that delegates will take away from the conference

➢ La détection doit porter sur les trois types de compétences ; savoirs, savoir-faire et savoir être
➢ Mixer distanciel et présentiel permet d’assurer une plus forte efficacité de la formation
➢ Permettre aux apprenants de s’entraîner et de refaire autant de fois que nécessaire est un gage de réussite
➢ Préserver des temps de partage et d’échanges est indispensable, particulièrement quand on recourt à l’apprentissage en distanciel

Abstract (no more than 500 words)

Chez SNCF, la voie principale pour accéder à un poste de manager opérationnel en responsabilité d’une équipe conduite est la promotion interne. En effet, la détection a lieu presque exclusivement parmi les conductrices et conducteurs de train. Cette sélection est assurée par les entités opérationnelles, en lien avec l’Ecole Nationale des Compétences Traction pour les Managers (ENCTM).
Une fois identifiés, les candidats font l’objet d’une préparation, qui dure environ un an. Lors de cette phase de préparation, les candidats sont accompagnés et supervisés par un tuteur, lui-même manager expérimenté.
Cette phase de préparation porte, entre autres, sur la maîtrise des aspects techniques et réglementaires liés au métier de la conduite. Elle comporte des Rencontres en présentiel, une journée d’assouplissement pour travailler sur la posture managériale ou encore des restitutions orales sur le métier.

Soucieuse de faire monter en compétences les candidats sur les capacités d’analyse, de synthèse et de formalisation écrite essentielles à tout manager, l’ENCTM a en outre conçu et déployé, début 2018, un nouveau dispositif, dénommé « Ascension Manager ».
Conçu sur le principe du « blended learning », ce programme de formation alterne modules e-learning et séquences en présentiel.

Ce small private online course (SPOC) comporte quatre modules. Le temps d’apprentissage de chaque module est estimé à 10 heures mais les candidats ont toute latitude pour s’organiser. L’objectif étant de finaliser chaque séance pour avancer dans le parcours.

Les contenus ont été co-construits avec des experts en management et en sciences humaines (auteurs, professeurs,…). Ils s’inscrivent aussi bien dans l’environnement professionnel du stagiaire, en l’occurrence l’environnement ferroviaire, que dans un autre secteur d’activité (milieu hospitalier, garage,…).

On peut notamment y trouver :

- des vidéos,
- des ressources documentaires pour aller plus loin,
- des exercices pour s’auto-évaluer et vérifier la progression pédagogique et la bonne appropriation des concepts,
- des forums permettant aux candidats d’interagir entre eux ou avec le formateur qui les suit,

Enfin, les séquences en présentiel, intercalées entre chaque module distanciel, sont indispensables à l’ancrage des apprentissages. Très appréciées des participants, elles sont construites en lien direct avec chaque module et elles permettent des apports, des mises en situation. La force de ce dispositif, c’est d’allier les concepts théoriques à la réalité professionnelle, tout en en profitant pour donner à voir ce qu’est le métier de manager et permettre ainsi aux candidats de s’y projeter.

A l’issue de la préparation, les candidats considérés comme prêts sont validés pour entrer en formation. Une formation en alternance d’une durée de 18 mois, au cours de laquelle deux autres modules e-learning leur seront proposés, portant cette fois sur les outils d’analyse.
Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

Digitalization of training & learning solutions (including social media): success stories

Optional Second Topic

Sans réponse

SNCF Mobilités - Direction de la Traction
Auteur : Caroline THERET
Directrice de l’Ecole Nationale des Compétences Traction pour les Managers (ENCTM)
caroline.theret@sncf.fr

Abstract

Title

Program to become a Drivers’ Manager (blended learning)

Key lessons:

- Detection regroups three mastering competencies: knowledge, savoir-faire and social skills.
- Mixing in-class sessions and remote classes offer the insure of a stronger training efficiency.
- Offering to learners the possibility to train and redo as many time as necessary is a guarantee of success.
- Preserving sharing times and exchanges are essential, particularly when appealing to remote learning.

Abstract in English

In SNCF, the main way to access operational manager posts in liability with a driving team is the intern promotion. Indeed, the detection occurs almost exclusively among the engineers. This selection is ensured by operational entities, linked with the National School of Traction Skills for Managers (ENCTM).
Once identified, candidates are formed during more or less one year. During this period of training, candidates are coached and supervised by a tutor, himself an experienced manager.

This training phase regroups, inter alia, the mastering of technical and regulatory aspects linked to the driving post. It includes physical meetings, a day of assessment in order to work on the managerial position or even oral restitutions of the job.

Concerned on improving candidates’ skills about analysis, syntheses and written formalization capacities essential to every manager, the National School of Traction Skills for Managers (ENCTM) has created and set up by early 2018 a new measure called “Ascension Manager”.

Conceived on the “blended learning” principle, this formation program combines e learning units and in-class sessions.

This small private online course (SPOC) includes four units. The learning time of each unit is estimated at 10 hours, but candidates have flexibility to organize themselves. The aim is to finalize each unit in order to progress in the course.

Contents have been co-edited by managerial and human sciences experts (authors, professors…). They fit as well in the professional environment of the intern, in this case the railway environment, than other lines of businesses (hospital setting, garage…).

They include:

- Videos,
- Documentary resources to go even further,
- Exercises for self-evaluation and check the educational progress and the good appropriation of the concepts,
- Forums allowing candidates to interact with each other or the instructor coaching them.

Finally, in-class sequences, interspersed between each e-learning class, are essential for the learning anchor. Really appreciated by the participants, it relates directly with every unit and allows real life professional situations. The strength of this measure is to ally theoretical concepts with professional reality, while giving to see what the job of manager is and so offers to candidates to project themselves.

By the end of the preparation, candidates evaluated as ready are approved to enter the training. This is a dual training for a period of 18 months, in which two other e-learning units will be proposed to them. They deal this time with analysis tools (cause tree, Ishikawa…) or even on the interview techniques and meetings leading.
WCRT Topics addressed in paper, First Topic

Digitalization of training & learning solutions (including social media): success stories

Optional Second Topic

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc.
17.

About the author

Name
THERET Caroline

Position
Directrice de l’Ecole Nationale des Compétences Traction pour les Managers

Company
SNCF

Email
caroline.theret@sncf.fr

Telephone
+33619284640

Abstract

Title
Une nouvelle formation pour accompagner un nouveau métier : les Adjoint Référents Conduite

List the key lessons or learning point that delegates will take away from the conference

- Les organisations SNCF évoluent fortement ; la formation se doit d’accompagner ces évolutions
- Emergence d’un nouveau modèle managérial et de nouveaux métiers associés
- Les formations doivent privilégier l’apprentissage en situation de travail via des séquences sur simulateur
- Le développement des soft skills est essentiel : savoir observer, savoir dire les choses

Abstract (no more than 500 words)

SNCF a fait évoluer son organisation en Île de France pour répondre au mieux aux attentes de ses clients et être plus performante. Pour répondre aux évolutions du marché, nos territoires administratifs sont amenés à bouger, avec l’objectif de rassembler les équipes opérationnelles autour du produit et du service proposés à nos clients.
A la conduite, les organisations évoluent également, à travers la mise en place de collectifs
de 40 à 50 conducteurs animés par un manager Traction. Pour aider ce dernier, un nouveau métier se met en place : l’Adjoint Référent Conduite (ARC). Un métier dont la mission principale consiste à être en appui du manager Traction pour animer l’équipe et développer les compétences des conducteurs.

Les Adjoints Référents Conduite sont choisis parmi des conducteurs expérimentés souhaitant s’investir dans une nouvelle mission.
La parfaite maîtrise de la norme et de la réglementation, assortie d’un bon relationnel, sont des pré requis incontournables. Il faut également s’assurer de la capacité des Adjoints à adopter la posture appropriée en cabine de conduite et leur donner les techniques pour débriefer les conducteurs, anciens collègues, et rendre compte au manager de façon à ce que ce dernier déclenche les actions nécessaires le cas échéant.

Pour accompagner cette évolution, l’Ecole Nationale des Compétences Traction pour les Managers a conçu une nouvelle formation dédiée aux Adjoints Référents Conduite. D’une durée de trois jours, cette formation est axée sur le développement des techniques et des compétences des ARC pour accompagner les conducteurs dans la réalisation de leurs gestes métier.

Alternant séquences en salle et entraînements sur simulateur de conduite, la formation est entièrement construite à partir de mises en situation concrètes adaptées à la réalité du terrain. Elle est co-animée par deux experts métiers de la Traction.
A l’issue des trois jours, l’adjoint référent conduite a commencé à développer des compétences comportementales essentielles :
- Savoir observer ce qui se passe en cabine,
- Savoir dire les choses et être en capacité de faire un feed back au conducteur,

La dernière séquence est consacrée à la définition de la feuille de route. Chaque Adjoint repart ainsi de la formation en ayant amorcé sa feuille de route, à partager ensuite avec son manager de retour dans son entité.
Autre point fort ? Un suivi post formation est proposé aux Adjoints référent conduite, après quelques semaines de mise en pratique, pour accompagner au mieux leur prise de poste.

Pas loin de 50 conducteurs auront été formés à la mission d’adjoint référent conduite d’ici la fin de l’année 2018. Les retours et les évaluations sont très positifs, avec un taux de recommandation de 90%.
Par ailleurs, l’ONCF ayant exprimé son intérêt pour cette formation, un échange interculturel est en cours pour permettre à nos collègues marocains de dupliquer notre approche pédagogique.

**WCRT Topics addressed in paper, First Topic**

Development of competencies for HS jobs as well as new jobs
Optional Second Topic

Sans réponse

English version

SNCF Mobilités - Direction de la Traction
Auteur : Caroline THERET
Directrice de l'Ecole Nationale des Compétences Traction pour les Managers (ENCTM)
caroline.theret@sncf.fr

Abstract

Title

A new training course for a new profession: the driving referent assistant.

Key Lessons:

- SNCF’s organization is strongly evolving; the training must go along with these evolutions.
- The emergence of a new managerial model and new associated jobs.
- Trainings must prefer teaching in work situation via simulator sequences.
- Soft skills’ development is essential: knowing how to observe, and to tell things.

Abstract in English

SNCF has evolved its organization in Ile-de-France to ensure the best services to clients’ needs and be more performant. To comply with market’s evolution, our administrative territories’ aim is to gather operational teams around the product and the service provided to our clients.

At the driving, organizations also evolve through networks’ implementation of 40 to 50 drivers managed by a Drivers’ manager. A new position is being created to help the latter: the driving referent assistant. This position includes a principal mission: relieve the traction manager in organising the team and improving drivers’ skills.

The driving referent assistants are chosen amongst experienced drivers wishing to invest themselves in a new mission. The perfect mastering of norm and regulation, matching with good interpersonal skills, are critical prerequisites.

Assistants capacity in adopting an appropriate attitude in the driver’s cab must be checked in order to offer them work methods to debrief drivers or former colleagues. It will latter help
the Assistants in realizing reports to the manager: so they can trigger appropriate actions in case of need.

To support this evolution, the Ecole Nationale des Compétences Traction pour les Managers (National School of Traction competencies for Managers) has conceived a new training dedicated to the driving referent assistant.

During a three-day period, the training is focusing on the development of techniques and competencies of driving referent assistant to support drivers in the realization of their professional routine.

Switching between class sessions and training on a driving simulator, the formation is entirely based on concrete work situations, adapted to field reality. It is co-animated by two experts of work’s Traction.

Fallowing the three days, the referent assistant driver will start to develop essentials behavioural skills:

- Knowing how to observe what is happening in the cab,
- Knowing how to tell things and be able to make a feed-back to the driver.

The last sequence is dedicated to the definition of the roadmap. Each assistant leaves the formation initiating his roadmap, sharing it next to his manager back in his entity.

Another strength? A post training follow-up is proposed to the referent assistant driver, few weeks after practical application, in the best way their new job duties.

Almost 50 drivers will have been trained to the referent assistant driver mission by the end of the year 2018. The feedbacks and evaluations are very positive, with a recommendation rate of 90%.

Furthermore, the ONCF having expressed its interest for this formation, an intercultural exchange is in progress to allow our Moroccan colleagues to duplicate our pedagogical approach.

**WCRT Topics addressed in paper, First Topic**

Development of competencies for HS jobs as well as new jobs

**Optional Second Topic**

International co-operation between companies
18.

About the author

Name
PROSPER Christophe

Position
Chef de projet Nouvelle culture de sécurité Traction

Company
SNCF

Email
christophe.prosper@sncf.fr

Telephone
Sans réponse

Abstract

Title
La formation au service de la montée en compétences des managers sur la culture de sécurité

List the key lessons or learning point that delegates will take away from the conference

- Un changement de culture de sécurité s’accompagne et s’ancre sur le long terme
- Il est indispensable d’associer les managers à ce changement de culture, pour le diffuser largement
- Une formation efficace mixe regroupements présentiels et modules à distance
- La théorie ne suffit pas. Il faut mettre en pratique pour capitaliser sur ce qui a été vu

Abstract (no more than 500 words)

Depuis quelques années, le groupe SNCF a amorcé une évolution de sa culture de sécurité, en intégrant notamment les facteurs organisationnels et humains, la culture du Juste et Equitable ou encore le droit à l’erreur.

La Direction Traction, en charge de la formation et de l’animation des métiers de la conduite, dispose aujourd’hui de quelques experts en facteurs organisationnels et humains, qui ont été formés pendant deux ans en suivant le diplôme spécialisé « Manager des organisations à
risques ».
Ce sont des ressources précieuses pour faire évoluer la culture de sécurité : ils portent les messages sur le terrain et opèrent un premier niveau de sensibilisation.
Ce n’est cependant pas suffisant. En effet, quand ces experts ne sont plus là pour accompagner les managers opérationnels, ces derniers ont du mal à traduire ces principes dans les pratiques de leurs activités quotidiennes.

Soucieuse d’aller plus loin et plus vite dans le déploiement de la nouvelle culture de sécurité, la décision a donc été prise d’organiser la montée en compétences des managers sur les facteurs organisationnels et humains et sur la culture de sécurité.

Pour ce faire, les équipes SNCF ont sollicité l’ICSI (Institut pour une Culture de Sécurité Industrielle) afin de co-construire un parcours de formation complet.
Ce nouveau programme a d’abord été proposé à 15 collaborateurs volontaires de la Direction en charge de l’animation du métier Traction. Fort des retours positifs qui ont suivi, ce programme est en cours de généralisation à hauteur de deux sessions par an.
Objectif : tisser un réseau de référents présents dans chaque unité opérationnelle, sur l’ensemble du territoire national, qui seront de véritables appuis pour accélérer le changement.

Le programme de formation a été baptisé Maîtrise des Organisations Associant Individus et Interfaces (MOAÏ). Il est organisé sur 6 mois. Une première partie de la formation est dédiée à l’acquisition de connaissances, avec notamment un questionnaire d’auto-évaluation pour permettre à chacun de se situer.

Puis trois leçons e-Learning sont proposées, représentant chacune environ 10 heures d’apprentissage, sur les thématiques suivantes :

- Leçon n°1 : facteurs organisationnels,
- Leçon n°2 : facteurs humains,
- Leçon n°3 : culture de sécurité

A travers ces modules de formation e-learning, les apprenants ont accès à des vidéos, des exercices pour s’autoevaluer, des quiz ou encore l’accès à des ressources documentaires pour aller plus loin dans la maîtrise des concepts.
Cette formation comporte aussi des regroupements en présentiel pour consolider et ancrer les apprentissages. L’occasion aussi de favoriser les échanges et les partages de bonnes pratiques.

En fin de parcours, la mise en application est organisée. Les participants choisissent un sujet individuel pour transposer ce qu’ils ont appris dans un projet concret lié à leur activité, leur métier. Ils élaborent une feuille de route, bénéficient de coaching, de séances de peer to
peer et de trois journées de suivi et de consolidation durant lesquelles ils peuvent partager leurs interrogations et leurs expériences.

**Abstract in English (no more than 500 words)**

_Sans réponse_

**WCRT Topics addressed in paper, First Topic**

Safety risk culture (personnel & customer safety/railway safety)

**Optional Second Topic**

_Sans réponse_

**English version**

**SNCF Mobilités - Direction de la Traction**

Auteur : Christophe PROSPER
Département Traction Métier Sécurité
christophe.prosper@sncf.fr

**Abstract**

**Title**

How to train the managers for a safety risk culture

**Key lessons:**

- A health security change is perfected and fixed on long term
- It is essential to associate managers to this cultural change to largely diffuse it
- An effective formation matches in-class gathering and correspondence units
- Theory is not enough. It must be implemented to capitalize on what have been seen.

**Abstract in English**

For some years now, the SNCF group initiated a security culture evolution by including most notably organizational and human factors, thanks to a culture of rights and fairness and even the possibility to make a mistake.

The Head of Traction, in charge of the training and hosting of the (driving jobs), have today a few experts in organizational and humans’ factors, that have been trained “for two years following the specialized diploma “Manager of operations at risk”.
These are precious resources to evolve society culture: They bring messages to the field and operate a first level of awareness.

However, this is not enough. Indeed, when these experts are not there to support operational managers, these latter struggles to translate these principles as habits of their daily activities.

Concerned to go further and faster in the deployment of the new security culture, the decision to organize the skill improvement of managers on organizational and human factors and the health culture has been taken.

To do so, the SNCF’s teams requested the IISC (Institute for an Industrial Security Culture) to build a complete formation track.

This new program has first been proposed to 15 voluntary collaborators of the Direction in charge of hosting the Traction job. After the positive feedbacks received, this program is in generalization process at the height of two sessions per year.

Objective: form a network of referents present in each operation units throughout the entire country, they will be real support to make the change faster.

The formation program has been named Masteries of Organizations Combining Individuals and Interfaces (MOCII). It is a 6 month organization. A first part of the formation is dedicated to the acquisition of skills, with for instance a self-assessment questionnaire to enable anyone to situate themselves.

Then three e-learning lessons are proposed, with each representing approximately 10 hours of learning process on the following themes:

- Lesson n°1: Organization factors,
- Lesson n°2: Humans factors,
- Lesson n°3: Health culture

Throughout these e-learning formation units, learners get access to videos, exercises to self-evaluate themselves, quizzes and also access to documentary resources to go further in the concept’s mastery.

This formation also includes in-class gathering to consolidate and cement their knowledge. It is also the opportunity to create exchanges and to share good practices.

At the end of the program, implementation is organized. The participants choose an individual subject to transpose what they have learned with a short project linked to their
activity, their jobs. They develop a roadmap, get coaching support, peer to peer sessions, and three days of monitoring and consolidation, during which they can share their interrogations and experiences.

**WCRT Topics addressed in paper, First Topic**

Training initiatives / Safety risk culture (personnel & customer safety/railway safety)

**Optional Second Topic**

Management and leadership development
List the key lessons or learning point that delegates will take away from the conference

- How to design an effective knowledge transfer
- Suitable tools to secure non-documentated knowledge
- Training for facilitators that accompany knowledge transfer
- Best practice

Abstract in English (no more than 500 words)

Whenever employees leave a company, essential knowledge for organizational success is often lost.

Imminent loss of knowledge has to be recognized in time in order to plan and execute a systematic transfer of knowledge from the retiring employee to his/her successor. An important challenge for the company is also to secure non-documentated knowledge of experience.
To this end, Deutsche Bahn Group has developed checklists, tools and a qualification program for facilitators who professionally accompany the process of knowledge transfer; these have been used successfully since 2016.

We show how the Deutsche Bahn Group qualifies chosen facilitators and how employees can be prepared to pass on their knowledge in a structured manner. Typical difficulties of this process are being presented and an insight is given into the systematic and successful support of knowledge transfer.

In this way, the new employee can be quickly familiarized and performance is maintained. Apart from that a well-planned and appreciative exit is an important contribution to corporate culture and secures learning ability and innovative potential.

**WCRT Topics addressed in paper, First Topic**

Sustainability of knowledge management – transfer of railway knowledge to the new generation. Which role for training?

**Optional Second Topic**

*Sans réponse*
About the author

Name
Boris A. Lyovin, Vladimir N. Glazkov, Evgeny Yu. Zarechkin (corresponding author)

Position
Rector, director of a centre, vice rector

Company
Russian University of Transport

Email
mirtr@mail.ru

Telephone:+7 495 6842877

Abstract

Title
Particularities of syllabi of railway vocational, bachelor, engineer and master courses in a transport university

List the key lessons or learning point that delegates will take away from the conference

The paper will give opportunity to discuss the range of problems regarding attractiveness of railway education, its adaptability to different countries’ conditions, and best practices in its organisation.

Abstract in English (no more than 500 words)

Russian University of Transport (RUT) is one of Russian universities offering railway high and higher education. After graduating the students get qualifications that are railway specific and allow them to occupy jobs in railway and transport companies, while permitting employers to considerably shorten the time necessary for initial in-corporate adaptation of graduates.

The report is intended to offer the analysis of most important particularities of the syllabus and of organisation of training courses regarding high (vocational) education and higher education leading to different degrees (bachelor, engineer, master). The study, while focusing on experience of the RUT, certainly covers best international practices in railway education as well as provides relevant examples referred to other modes of transport.
The authors provide, particularly, comparative study of:

- Relationship between required qualifications for different railway job positions and education degrees;
- Relationship between qualification framework, professional standards and educational standards;
- Relationship of syllabi and national educational standards (possibility to flexibly adapt syllabi to standards and at the same time to include a set of modules tuned to employees’ requirements);
- Field of railway education and training: railway specific, railway related and intermodal skills as a set of required competences;
- Range of railway degrees regarding different railway occupational fields (construction, maintenance, operations, signaling, rolling stock) and of railway modules included in transport degree courses, differentiation between particular tasks of bachelor, engineer and master courses, of vocational training;
- Balance of theoretical knowledge, general professional railway competences, practical skills and soft competences offered to students in different courses with a focus on the practical skills segment in different education syllabi;
- Role and efficiency of internships included in syllabi as of important instrument to provide skills focused on future job position and specific workplace;
- Digital educational tools and impact of digitalization of railways on the syllabi: conservativeness and flexibility in railway education;
- Specific tools of training tuning based on employers’ requirements and additional courses of a choice to enhance the competence of graduated;
- New technology trends and their impact on educational and training trajectories for future railway employees.

The comparisons in the framework of experience of other national and international universities result in conclusions on advantages and disadvantages of high and higher education as compared with general engineering and management syllabi followed by in-corporate adaptation training. The practical aspect of analysis of implementing railway syllabi in high and higher education should take into account economic aspects of cost-quality ratio for universities and railway companies, professional and social attractiveness of railway education for the youth.

The paper will give opportunity to discuss the range of problems regarding attractiveness of railway education, its adaptability to different countries’ conditions, and best practices in its organisation.

**WCRT Topics addressed in paper, First Topic:** Training design

**Optional Second Topic:** National organisation of training. How standards are applied
23

About the author

Name
Jörg Demitz

Position
Head of Sales Simulation Systems

Company
Scheidt & Bachmann System Technik GmbH

Email
demitz.joerg@scheidt-bachmann-st.de

Telephone
+49 431 2481 448

Abstract

Title
Learn from Mistakes - Encountering Consequences from wrong Decisions in Training Sessions improves Learning Success

List the key lessons or learning point that delegates will take away from the conference

Learning methods
Competence development
Training software solutions
Training methodology
Best practice

Abstract (no more than 500 words)

In railway operation mistakes performed by operational staff might have dramatic results. Human errors causing derailments or train crashes must be prevented at any time by technical systems and operational rules. However, every human being has developed skills and competence from making mistakes. Try to remember how you have learned riding a bike. It never worked well right from the beginning, you had to make mistakes and learn from them to develop and improve the
technical skills. Guidance from parents was welcome during this process but the skills itself could only be developed from own practice and own failures. Considering a similar situation in railway operational training the process nowadays is different. Trainers explain their students a lot of things they should never do because it will cause danger or at least delay minutes. The students should usually practice the correct handling in different situation. Compare this process to how you learned bike riding and spot the difference.

A lot of research and practical experience in training processes have shown that students in a training process are better motivated when they can experience technical context by themselves rather than being introduced by a trainer. So why not allowing the students to practice in an environment, where they can make mistakes, experience the results of mistakes and being guided afterwards to learn from the mistake made.

In railway operation (e.g., operating trains from a control centre) most incidents are handled by defined procedures. The operators are more or less guided by the systems they operate. To allow operation in degraded mode in case of technical problems the procedures help to keep the required safety in rail operation. Such procedures are very often considered to be extremely boring and the reasons behind the procedures are not always understood by trainee operators. If the trainees are able to experience the correct procedure in case of a dedicated incident they will understand the reasons behind the procedure much better.

Scheidt & Bachmann has developed together with DB Netz and DB Training a simulation environment in which students in railway operation as well as experienced traffic controllers can learn procedures by themselves. In the tool, the general content and purpose of the training session is presented. After having learnt the basic principles the students can practice the procedure by themselves and get an evaluation of their actions afterwards. Each deviation from the correct procedure is shown and they can try again to operate the correct commands of the procedure. After a limited number of false attempts the students get additional hints concerning the correct procedure.

The training tool can run completely autonomous. The students can practice as often as they like and make as many failures as they want. Only in case they do not find the right solution by themselves they can contact a trainer.

The presentation will focus on the specific training needs in railway traffic control training and a software solution to fulfil those requirements will be presented.

Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

Research & development for innovation in the area of training

Optional Second Topic
Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc.
24.

About the author

Name
CHERENE HUBERT

Position
Directeur UNIVERSITE TRANSILIE

Company
SNCF

Email
hubert.cherene2@sncf.fr

Telephone
+33 (0)6 60 93 46 11

Abstract

Title
L’enrichissement de l’expérience formation grâce au digital

List the key lessons or learning point that delegates will take away from the conference

Digital solutions open up new perspectives for the world of vocational training, which must meet several challenges:
+ Supporting digital transformation for company employees
+ The integration of digital technology into teaching practices to update the training curriculum, the skills, and role of trainers
+ Taking into account the habits and expectations of learners, especially the younger generations

Le digital ouvre de nouvelles perspectives au monde de la formation professionnelle qui se doit de relever plusieurs défis:
+ L’accompagnement de la transformation digitale auprès des collaborateurs de l’entreprise
+ L’intégration du numérique dans les pratiques pédagogiques en renouvelant l’ingénierie de formation, les savoirs faire et posture des formateurs
+ La prise en compte des nouveaux usages et attentes des apprenants, en particulier des jeunes générations
Pour relever ces défis, l'Université Transilien a imaginé d’enrichir ses parcours de formation en y intégrant le digital de bout en bout : depuis l’accès à l’offre de formation jusqu’à l’évaluation finale, en passant par l’animation de formation (avant, pendant et après).

Abstract (no more than 500 words)

La révolution digitale a profondément modifié les organisations et les pratiques professionnelles. La formation se doit d’accompagner cette transformation en développant les compétences digitales des collaborateurs de l’entreprise. Pour cela elle doit être elle-même exemplaire en intégrant le digital dans chacune de ses dimensions.

La généralisation des smartphones et la diminution des coûts de production des outils numériques (en particulier des applications) permettent d’envisager un écosystème de formation plus accessible, plus fluide et répondant mieux au besoin de personnalisation des parcours.

+ Le digital pour accompagner l’apprenant :
L’Université Transilien a co-conçu avec les apprenants, les managers et les formateurs une application spécifique qui sert de « compagnon pédagogique » à l’apprenant.
Outre l’accès au catalogue digital, cette application permet aux collaborateurs de mieux préparer leur venue en formation :
Notification avec rappel des informations pratiques sur la formation (date, heure, lieu) et de la présentation des objectifs de formation. L’Utilisateur a également accès à d’autres fonctionnalités comme l’itinéraire, la déclaration de retard ou d’absence pour prévenir le centre en cas d’empêchement.
L’application permet de diffuser des contenus en amont, pendant ou après la session présentielle et de réaliser l’évaluation de satisfaction.
Cette application disponible dans le store de l’entreprise est installée automatiquement sur l’ensemble des smartphones des collaborateurs de Transilien.
A ce jour, il y a déjà eu 2000 connexions..

L’Université Transilien développe également des outils digitaux pour renforcer les apprentissages à distance dans le cadre de dispositif en blended learning mais également en présentiel.
+ Du mobile learning en amont de la formation présentielle : des contenus diffusés à partir de la plateforme LMS, spécialement adapté pour la portabilité, contenu court, structuré en parcours avec une ergonomie adaptée.
+ Des applications d’entrainement pour les apprentissages en centre ou sur le terrain :
Application PROGEO qui permet aux jeunes embauchés de s’entrainer en géographie ferroviaire (compétence évaluée lors de l’examen final pour l’accès au grade d’agent du service commercial gare). Application PRO CAB, PRO ART qui permettent de s’entrainer à distance à la maintenance des appareils de contrôles via une modélisation 3D des appareils ou en présentielle avec la fonction réalité augmentée.
+ Des outils digitaux qui permettent de gamifier la formation présentielle : KLAXOON qui permet d’interagir avec les apprenants dans le cadre d’une aventure conçu en amont et qui rythme la session d’apprentissage : quiz, sondage, exercice brainstorming, etc. Le smartphone devient alors un outil ludique au service de la pédagogie. La fonction Vidéo des smartphones est également utilisée dans des séquences actives pour réaliser des tutoriels ou simulation de cas clients. L’Université Transilien a saisi ses évolutions technologiques comme autant d’opportunités pour augmenter la qualité de service et proposer une expérience de formation marquante et valorisante, répondant à la fois aux attentes des apprenants mais également des commanditaires. Cette transition a permis de renforcer les compétences des équipes pédagogiques : sur le digital, sur les compétences d’ingénierie de formation en questionnant les pratiques traditionnelles de la formation et la posture de formateur.

Abstract in English (no more than 500 words)

The digital revolution has profoundly changed organizations and professional practices. Training must accompany this transition to develop the digital skills of company employees. For this, the company must set the example by integrating digital solutions at all levels. The widespread use of smartphones and the decrease in production costs of digital tools (especially applications) make it possible to imagine a more fluid and more accessible training ecosystem that better meets the need for course customization.

+ Digital solutions to accompany the learner:

The Transilien University has co-designed with the learners, managers and trainers a specific application that serves as a "pedagogical companion" for the learner. In addition to accessing the digital catalog, this application allows employees to better prepare for their upcoming training:
- Notifications with reminders of practical information for the training (date, time, place) and learning objectives.
- It also has other features such as itinerary and the opportunity to notify the training center in the case of delay or absence.
- The application can also broadcast/push content before, during, or after the session to reinforce the content seen in training.
- Finally, the application also includes satisfaction surveys at the end of each training.

This application, available in the company app store, is automatically installed on the smartphones of all collaborators of the University Transilien. To date, there have already been 2,000 connections.
The UTN The Transilien University is also developing digital tools to reinforce distance learning as part of both blended learning and face-to-face learning systems. 
+ Mobile learning before face-to-face training: content distributed from the LMS platform, is short, specially adapted for portability and ergonomically structured.
+ Training applications for practice in the classroom or on the field: PRO GEO is an application that allows young recruits to train in railway geography (skills assessed during the final statutory exam for access to the rank of agent of the commercial service station). PRO CAB and PRO ART apps that allow remote training in the maintenance of equipment via 3D modeling of devices or face-to-face with the function augmented reality.
+ Digital tools that make it possible to gamify face-to-face training: KLAXOON is a tool that allows you to pre-design an “adventure” with learner interactions throughout the learning session (quiz, survey, exercises with or without timer, brainstorming, etc.) The smartphone therefore becomes a fun tool at the service of pedagogy. The video function of smartphones is also used in active sequences where learners are invited to make tutorials or client role playing videos.

The Transilien University has seized its technological development as an opportunity to increase the quality of service and offer a training experience that is both meaningful and rewarding, meeting the expectations of both learners and stakeholders.
This transition also helped to reinforce the skills of the teaching teams: on digital literacy, but also on pedagogical engineering skills by questioning the traditional practices of training and the role of the trainer.

WCRT Topics addressed in paper, First Topic
Digitalization of training & learning solutions (including social media): success stories

Optional Second Topic
Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc.
25.

About the author

Name
CHERENE HUBERT

Position
Directeur UNIVERSITE TRANSILIEN

Company
SNCF

Email
hubert.cherene2@sncf.fr

Telephone
+33 (0)6 60 93 46 11

Abstract

Title
Ludification des dispositifs de formation : le jeu pour favoriser l’apprentissage de notions complexes

List the key lessons or learning point that delegates will take away from the conference

How has SNCF TRANSILIEN leveraged games to promote the learning of complex notions among learners?
+ To train staff regarding Mass Transit (dense zone)
+ To increase the engagement and knowledge retention by increasing the attractiveness of training
+ To adapt to the expectations and habits of new generations without excluding others
+ To develop soft skills (such as agility, listening, and teamwork) through games

Comment SNCF TRANSILIEN s’est emparé du jeu pour favoriser l’apprentissage de notions complexes auprès des apprenants?
+ Former les personnels aux compétences du Mass Transit (exploitation en zone dense)
+ Augmenter le taux d’engagement et l’ancrage des connaissances ; augmenter l’attractivité des formations
+ S’adapter aux attentes et usage des nouvelles générations sans exclure les autres.
+ Développer les soft skils à travers le jeu : agilité, écoute, équipe... ;

Abstract (no more than 500 words)

La spécificité de la formation pour l’activité Transilien réside dans la compréhension du Mass Transit, c’est-à-dire l’acquisition d’une vision globale de la production ferroviaire en Zone dense. L’Ile de France représente 10% du réseau ferré national, 40% des circulations et 70% des voyageurs de la SNCF. Pour gérer la densité des flux de voyageurs, les agents doivent maîtriser une palette de compétences large : information voyageurs, prise en charge des clients, production ferroviaire,
Comment aborder ces notions complexes en formation, dans les formations initiales et comment aider les managers à veiller ces compétences ?
Transilien a repensé le modèle pédagogique pour s’approprier et diffuser cette notion en s’appuyant entre autre sur l’utilisation de jeux pédagogiques.
Pourquoi ce recours à la gamification ?
Le jeu, qu’il soit de plateaux ou en ligne, connait un essor important en France : les cafés ludiques et escape games fleurissent dans nos villes, les MMORPG (massively multiplayer online role-playing) ne cessent de recenser de nouveaux joueurs. La recette de ce succès : la mise en réseau de personnes autour d’une activité ludique, créatrice d’émotion, qui s’adresse à toutes les générations.
Les différents ressorts des jeux font appel à des compétences parfois complexes d’appropriation des règles, de gestion de ressources, de stratégie et de communication.
La success story du jeu est un modèle inspirant pour la formation, en particulier pour transmettre des notions complexes.
Le Mass Transit faisant partie intégrante de la stratégie Transilien, le parcours de formation s’est enrichi de plusieurs activités ludiques :
La conception d’un jeu de plateau utilisé lors de formations présentielles : les joueurs s’affrontent en équipe pour produire un train en zone dense et satisfaire les attentes des clients.
Le réalisation d’un Escape Game : ce jeu s’adresse aux managers Transilien. Enfermé dans une pièce, ils ont 60 min chrono pour accomplir une mission.
Ils doivent mobiliser leurs connaissances pour résoudre des énigmes, tant en gérant le temps, le stress, en communiquant et interagissant avec leurs collègues.
L’idée étant de proposer une expérience émotionnelle afin d’ancrer les savoirs.
La conception d’un plateau technique d’apprentissage : l’objectif est de sortir du cadre formel de la salle de formation en proposant une immersion dans le monde ferroviaire avec
une reproduction de l’environnement gare enrichie d’éléments en réalité augmentée (portique automatique de contrôle des titres, automates de vente de billets de trains, écrans de contrôle...). Ce plateau doit favoriser les interactions, essentielles dans un environnement Mass Transit.

Ces modalités pédagogiques transforment l’expérience de formation : les participants sont dans un état d’esprit détendu et positif. Les erreurs sont considérées comme des phases du jeu et non comme des "fautes".

Pour le formateur, cela renforce sa posture d’animateur. Il utilise les astuces d’un game master, centré sur l’expérience, les émotions et sur la réussite des apprenants.

Abstract in English (no more than 500 words)

The specificity of the training at Transilien lies in the understanding of Mass Transit, that is to say the acquisition of a global vision of the railway production in a dense zone. The Ile de France region accounts for 10% of the national rail network, 40% of its rolling equipment, and 70% of SNCF travelers. To manage the density of passenger flows, Transilien agents must master a wide range of skills: travel information, customer care, railway production, safety, etc.

But how to address these complex concepts in training, especially in initial training, and how to help managers to coach these skills?

Transilien has redesigned its pedagogical model to appropriate and disseminate this notion of Mass Transit by relying, among other things, on the use of educational games.

Why resort to gamification?

The game, whether on-line or in-game, is booming in France: fun cafes and escape games are flourishing in our cities, MMORPGs (massively multiplayer online role-playing) are constantly winning over new players. The recipe for this success: the networking of people around an activity that is fun, emotional, and is suitable for all audiences.

Some of the different challenges offered by games are appropriation of complex rules, resource management, strategy, and communication.

The success story of games is an inspiring model for training, especially in dealing with conveying complex notions. As Mass Transit is an integral part of the Transilien strategy, the Mass Transit training course offered to agents has been enriched by several fun activities:

+ The design of a micro-learning platform where learners are invited to understand the issues of Mass Transit and operations in dense areas.
+ The design of a board game used during face-to-face training: players compete in teams to produce trains in dense zones and try to satisfy as many customers as possible.
+ The creation of an Escape Game (or Escape Room) for Transilien managers: locked in a room, they have 60 minutes to complete a mission. They must mobilize their knowledge to solve puzzles, managing their time and stress, and communicate and interact with their colleagues.
The design of a technical learning platform: the objective is to leave the formal framework of the classroom by offering an immersive experience, with a reproduction of the station environment enriched with elements in augmented reality (ticket control equipment, ticket sales equipment, information screens). This platform must encourage interactions and inter-business situations, which are essential in a Mass Transit environment.

All of these teaching methods radically transform the training experience: the participants are in a relaxed and positive state of mind. Errors are considered part of game play and not as "defects".

For the trainer, this reinforces his role as animator. He is the game master, focusing on the experience, emotions, and success of learners.

**WCRT Topics addressed in paper, First Topic**

Research & development for innovation in the area of training

**Optional Second Topic**

Training design
26.

About the author

Name
Frank Michelberger

Position
Head of Research Institute

Company
University of Applied Sciences St. Poelten

Email
frank.michelberger@fhstp.ac.at

Telephone
Sans réponse

Abstract

Title
Inspiring and Hiring the Next Generation - Strategies for a Common Approach

List the key lessons or learning point that delegates will take away from the conference

- Overview of good practice in attracting new generation
- Strategies and activities for a common approach between industry, railway and universities

Abstract (no more than 500 words)

Not only have the companies in the railway industry faced the problem of recruiting young people, but also the universities. For us universities, it is particularly important to get young people interested in studying railways. Because if we manage to interest people in this topic in such a way that they study with us, they are “in the system” and at the end of their studies they are available to the companies in the railway as potential employees. Therefore, the key question is how we manage to get young people who are in school excited about studying railways. For this, we have different formats, which we commonly use. This starts with the communication with the target group of the pupils in different formats like for example lectures in schools, targeted invitations of school classes to the
university and communication via social media.

In addition, there are more special activities such as internships at the institute. Here students can do an internship at an institute at a university during their holidays and get an insight into railway research. In Austria we are in the fortunate position that this type of internship is funded by the Federal Ministry of Transport, Innovation and Technology. Another possibility that we have carried out is the cooperation with schools in a research project, more specifically the project “bridging gaps”, where the University was working together with schools from different levels, even a kindergarten, with the aim to inform and in the end hopefully to animate the kids about scientific work in the field of railway construction.

The paper presents these activities in detail and carries out an evaluation. It can already be anticipated that these activities only occasionally lead to a young person being interested in studying the railway. The conclusion for this part will be that although these activities are complex and success is not directly measurable, they are still necessary. In addition, cooperation between universities and industry is extremely necessary to inspire young people and convince them to study and work for the railways.

The second part of the paper looks at students who study part-time. Most of them are already working in the railway industry. When we ask this group how they became aware of our studies during the admission interviews for our studies, the answer is disproportionately often that they became aware of their studies through work colleagues. This leads to the conclusion that with this target group it is not the usual forms of communication that are most effective, but personal contact, preferably through colleagues who have studied or are still studying. Here the conclusion will be to further develop methods for this direct communication, which can be carried out together with the railway industry. Some methods will also be put up for discussion.

The overall objective is that more cooperation between the stakeholders like industry, operators, infrastructure managers and universities is necessary. Together the big picture of studying rail and after that working in rail can be promoted. So to get the best people to our business, we should unite our effort, inspire young people and connect them to the railway.

**Abstract in English (no more than 500 words)**

*Sans réponse*

**WCRT Topics addressed in paper, First Topic**

How do you attract the new generation to the railway sector through collaboration with colleges and universities

**Optional Second Topic**
27.

About the author
Name
Frank Michelberger
Position
Head of Research Institute
Company
University of Applied Sciences St. Poelten
Email
frank.michelberger@fhstp.ac.at
Telephone
Sans réponse

Abstract
Title
Job Profile Train Driver - Development of Measures for Dealing with Current and Future Challenges

List the key lessons or learning point that delegates will take away from the conference

- How do young people imagine the profession of the train driver and what do they expect?
- How does this cover the expectations of the railway companies?
- Overview of good practice in finding personnel for the profession of train driver

Abstract in English (no more than 500 words)

The biggest current challenge for many railway companies is to get enough qualified personnel for the job of train driver. In a scientific work at our university, this topic is examined. The aim is to develop measures or activities or solutions that help to improve the current situation, divided into short-term and long-term.

On the one hand, the expectations of both the railway companies and the potential future applicants, i.e. the young people, are asked. Interviews are carried out with HR managers and online questionnaires are sent out. The
young people are also addressed in personal interviews and contacted by means of questionnaires. On the one hand, this should provide a clear picture of the expectations and, on the other hand, how the expectations of the potential/future applicants coincide with the expectations of the companies. The key question here is "What are the gaps? Furthermore, it is surveyed which measures and actions will be implemented by the companies in order to benchmark them in terms of best practice. This is supplemented by the research of measures and actions that are or have been taken in such situations in other industries. Here, too, it will be verified which measures and actions have worked well and which have not and what can possibly be taken over for the companies in the railway sector. The overall aim of the work is to carry out an analysis of the collected information and to derive new measures and actions from it or to recommend which existing measures and actions can be adopted. In the full paper the status of the work of this project is presented and discussed with the attendees.

WCRT Topics addressed in paper, First Topic

Replacement of the ageing workforce

Optional Second Topic

How do you attract the new generation to the railway sector through collaboration with colleges and universities
Abstract

Kenitra - Tangier high-speed rail line: International co-operation between French (SNCF) and Moroccan Railways (ONCF) for tailor-made training to develop new skills for operating staff.

List the key lessons or learning point that delegates will take away from the conference

1. The transition from fast to high-speed trains is a big challenge that needs a change of mindset at all levels (operations, engineering, management technical, customer service, ...) in order to avoid setbacks. Training actions support organisational evolutions and are an essential part of the change management process.
2. In developing the training programmes, an agile methodology is recommended in order to increase interaction between parties and implement last minute changes.
3. Cross cultural competence of SNCF trainers is a key soft skill to maximise success.

Abstract in English (no more than 500 words)

“Université du Service” (UDS) is a major SNCF training institute whose main activities are to develop training programmes and transfer knowledge in order to develop skills of French railway professionals. In the past years, UDS has moved from traditional classroom-based learning to more modern options such as blended learning, the flipped classroom model and
digital learning. UDS network comprises 6 campuses in France, 130 employees and an average of 15 000 SNCF staff are trained each year.

In early 2009, a contract between Morocco’s rail company ONCF and SNCF was signed to cooperate on the high-speed rail line project to be launched in the second semester of 2018. In 2015, ONCF requested UDS expertise to develop specific training programmes for their staff, in anticipation of the new high speed service. We met their expectations by implementing top quality training activities for around 700 station agents, on board personnel, ticket officers, managers in cooperation with the Institut de Formation Ferroviaire (IFF) in Rabat. The programmes were conceived to develop hard and soft skills in: security/safety procedures, pricing policy and sales pitch, customer information and storytelling, ticket control procedures. This corporate training has been an essential part of the change management process ONCF personnel needed in order to develop the right mindset to evolve towards the new « high speed » environnement (new security procedures, new price structure...).

There was an outstanding staff satisfaction rate (on average over 90%) regarding the different training programmes. The reason for this success was due to the pluridisciplinary UDS team who has worked in close collaboration with ONCF in order to make regular adaptation due to changing circumstances. Implementing agile processes has allowed us to integrate last minute requirements without extending the deadline. Our digital facilities, experience in learning solutions and highly trained staff were competitive avantages that helped to deliver high quality service to ONCF.

Delivering the best training service on an international level requires an appropriate cross-cultural training of our employees. Intercultural competence is no longer seen as a soft skill but is now a required skill of anyone wishing to work in different countries. A lack of cultural sensitivity can lead to lost business, a failed assignment, poor client relationships and ultimately wasted time and investment. We provided to all our trainers who went to Rabat a cross cultural workshop to raise their awareness of the impact that culture and cultural differences have on business relationships and working practices. This training enabled them to have the knowledge and tools to communicate successfully with their moroccan trainees.

The international cooperation with ONCF allowed us to bring to another level SNCF « high speed » expertise and knowledge. Hard skills training programmes have long been our know-how but there are now interesting opportunities for rail companies to provide competitive and innovative training in soft skills.

**WCRT Topics addressed in paper, First Topic**: International co-operation between companies

**Optional Second Topic**: Sans réponse
29.

About the author

Name
Thierry BECAM

Position
DIRECTOR

Company
SNCF - UNIVERSITE DU SERVICE

Email
thierry.becam@sncf.fr

Telephone
+33155177043

Abstract

Title
Learning Lab of “Université of Service” (UDS) SNCF : open and flexible spaces supporting new learning methods.

List the key lessons or learning point that delegates will take away from the conference

- An essential evolution of the trainer profession: it is going through a change of both posture and culture (from knowing to intervening). The trainer will have to put in movement the knowledges, and get into position between agility and data culture.
- UDS is a member of the French Learning Lab Network. It’s providing innovative and collaborative spaces dedicated to new forms of learning to SNCF employees, but also employees from others companies.
- This Learning Lab is guiding by experimentation and innovation. Its main goal is to promote the emergence of new learning methods based on interactivity and creativity. Then, UDS will test, experiment, develop and continually improve those learning methods in order to release them to others educational institutions.

Abstract (no more than 500 words)
L’Université du Service (UDS) est un des plus importants instituts de formation interne de SNCF, dont les activités principales consistent à développer des programmes de formation et à transférer des connaissances afin de développer les compétences des professionnels des chemins de fer français. Au cours des dernières années, l’UDS est passée d’un apprentissage traditionnel en classe à des techniques plus modernes telles que le blended learning, la classe inversée et l’apprentissage à distance via le digital. L’UDS se compose de 6 campus en France, de 130 collaborateurs et forme une moyenne de 15 000 agents SNCF chaque année.

Toutes les formations sont accessibles via le Portail Formations de l’UDS (LMS – Système de Gestion de l’Apprentissage), qui offre à chaque agent SNCF au contact des clients un véritable espace personnel d’apprentissage.


Etendre ses périmètres d’action et revoir ses modalités pédagogiques doit s’appuyer sur une nécessaire montée en compétences des collaborateurs de l’UDS. Le formateur de demain aura développé son agilité, une posture de formateur-coach et la maitrise des méthodes pédagogiques innovantes, qu’elles soient digitales ou non.

Huit lots ont été définis dans le cadre du Projet de Transformation de l’UDS, dont un spécifique sur la création d’un Learning Lab au sein du campus de Nanterre. Il s’agit d’espaces collaboratifs innovants dédiés aux nouvelles formes d’apprentissage utilisant notamment les possibilités offertes par les nouvelles technologies de l’information et de la communication. Près de 3400 m2 à aménager !

L’objectif du Learning Lab est :
- de tester et d’expérimenter différents dispositifs de formation,
- de mettre à disposition des formateurs des outils digitaux et innovants afin d’imaginer des pédagogies différentes,
- de créer et d’imaginer des espaces modulables, au design visuel et fonctionnel.

La convivialité est une dimension importante du Learning Lab. Face à la digitalisation des outils, l’accent doit porter sur les relations humaines et le développement des compétences comportementales (soft skills).

Un seul mot d’ordre : changer la relation entre étudiants et formateur, donc la posture de ce dernier.

L’UDS fait partie, depuis décembre 2017, du Learning Lab Network en France. Une charte définit précisément ce que sont ces espaces d’apprentissage recouverts par la dénomination « Learning Lab » et l’UDS respecte tous les points suivants :
Favoriser l’innovation pédagogique en testant et en développant différents modes d’apprentissage.

Disposer d’un espace innovant au sein d’un organisme de formation permettant d’accueillir des formations, des rencontres, des séminaires, des productions, des expérimentations, des recherches, de l’observation.

Disposer d’un ensemble d’équipements numériques à l’appui pédagogique.

S’appuyer sur un dispositif de recherche sur l’innovation pédagogique (Learning & Développement).

Soutenir l’acquisition de compétences.

Etre un lieu ouvert et accueillant.

Abstract in English (no more than 500 words)

“Université du Service” (UDS) is a major SNCF training institute whose main activities are to develop training programmes and transfer knowledge in order to develop skills of French railway professionals. In the past years, UDS has moved from traditional classroom-based learning to more modern options such as blended learning, the flipped classroom model and digital learning. UDS network comprises 6 campuses in France, 130 employees and an average of 15 000 SNCF staff are trained each year.

All trainings are accessible in our LMS (Learning Management System), which offers a real personal learning space to each SNCF agents in contact with clients.

In 2016, UDS celebrated its 10th anniversary. The opportunity to question its trajectory, its identity and its strategy, its expectations and its ambitions, in coherence with a learning world in full change. Work was initiated, to structure a Transformation Project for the organization, which will be rolled out in 2019.

Extending its scope of action and reviewing its learning methods must be based on a necessary skills increase of UDS employees. The trainer of tomorrow will have developed his agility, a trainer-coach position and he will know how to integrate innovative learning methods, whether digital or not.

8 axes were defined as part of the UDS Transformation Project, including one relative to the creation of a Learning Lab. A Learning Lab have innovative collaborative spaces dedicated to new forms of learning, notably using the possibilities offered by new information and communication technologies.

The main goals of a Learning Lab is:

- to test and experiment different learning methods,
- provide trainers with digital and innovative tools to imagine different pedagogies
- create and imagine modular spaces, with visual and functional design.
Usability is an important dimension of the Learning Lab. Faced with the digitalisation, the focus must be on human relations and the development of soft skills.

One slogan: change the relationship between students and trainer.

Since December 2017, UDS is a member of the French Learning Lab Network. A charter defines precisely what are these learning spaces covered by the name "Learning Lab" and UDS respects successfully all the different following points:

- Promote educational innovation by testing and developing different learning methods
- Have an innovative space to host training, meetings, seminars, productions, experiments, research, observation...
- Have a set of digital equipment for pedagogical support
- Rely on a research system on learning innovation (Learning & Development)
- Support the development and acquisition of skills
- Being an open and welcoming place.

**WCRT Topics addressed in paper, First Topic**

Research & development for innovation in the area of training
30.

About the author

Name
Sudhendu Jyoti Sinha

Position
General Manager/Web Applications

Company
Centre for Railway Information Systems, Ministry of Railways, Govt. of India. Chankyapuri, Near Bihar Niwas, New Delhi 110021.

Email
sudhenduj@gmail.com

Telephone
8130077124

Abstract

Title
‘Ideation’ : Modeling and Upscaling Railway Leadership (A case study in Innovative Training Initiative)

List the key lessons or learning point that delegates will take away from the conference

This is a live case study.

For better service delivery and emphatic positioning of an organization it is significant that the Leaders-Managers on guard and those of future must develop the skill set of ‘ideation’. Training initiatives have a great role to play in developing this skill. The essential pre condition is that the trainer must believe that :

1. Ideas are born with free thinking and they mature with criticism.
2. No idea is ever small - Dare to think and speak.
4. 360° look around an idea.
5. Unique experience of process of Developing Ideas from Raw Perceptions to concreate Plan.
These will be the key takeaways for the delegates committed to ‘Unite Inspire and Connect’ that can be well illustrated through this case study.

Abstract (no more than 500 words)

i). Scope

The scope of this case study has been :

• To familiarize future managers of Indian Railways the concept of ideation and enhance their capacity to form new ideas and successfully implement them. These managers as they progress with time and performance gradually assume higher position of authority where they are able to provide policy direction to the entire organization.

• This entire case study is based on the premise that ideation as one of the most critical factor of good leadership can be trained and cultivated in the Senior Managers and Administrators.

• It is widely accepted that the leader is one who has the trust of the people around him that he has the desired sensitivity, drive and skill to pull his followers through most difficult of the crisis. It is also accepted that a leader should have capability of Strategic orientation, Problem solving orientation, Implementation ability, Communication and Meta-cognition.

• The value proposition which will drive these capabilities are widely accepted as Positive orientation, Calculated risk taking, Perseverance, Tempered self belief.

• A great idea should be maverick with instant gravity that can leave behind big impact. A great idea should be precise and clear entailing low cost and less gestation.

• The skill up gradation in ideation can be achieved through modeling technique, mathematical formula, diagrams and hands on exercises.

ii) Issues addressed

To inculcate and strengthen the skill of ideation in the target group following issues were addressed :

1. Strengths of a ‘great idea’.
3. Formation of ‘idea statement’ – Precise, Catchy and conveying the import clearly.
4. Explaining and highlighting the ‘big impact’ of a great idea.
5. Outlining ‘Big Moves’ / Imperatives to realize the aspirations.
6. Highlighting ‘enablers’ / ‘keys success factors’ for implementation of the idea.
7. Identifying ‘big risks’ and their ‘mitigation plan’.
iii) Objectives/Proposed Outcome

The target group, after this exercise and periodic reinforcement, practice and refresher inputs and feedback, was found to be absolutely confident. The popularization and impact has been so great that it is being replicated in other training academies and is gradually adopted as essential part of curriculum.

The paper is based on experiment conducted by the undersigned in my capacity as Dean of Centralised Railway Training Academy. It is therefore patently original ('The originality of the paper'). It is an innovative training initiative ('New ideas incorporated') to upscale ideation for Great Leadership. It is an experiment with the senior traffic transportation officers of Indian Railways one of the largest in size and operation with stellar impact on the transport choices in India. It, therefore, qualifies for ‘Fair Geographical Balance’ and deserves favourable appreciation and consideration.

The topic has an awesome impact when placed as presentation before the audience.

**Abstract in English (no more than 500 words)**

Already Provided above.

**WCRT Topics addressed in paper, First Topic**

Management and leadership development

**Optional Second Topic**

_Sans réponse_
Abstract in English (no more than 500 words)
As many other train operators, NSB has experienced challenges in effectively managing both national and internal training requirements to insure all employees – but especially train personnel – receive necessary training within set deadlines. Planning of training activities and follow-up of training needs were time-consuming tasks that were impeding effectivity efforts compelled by a new deregulated environment. Additionally, employees felt little involved in their own competency management, with limited or cumbersome access and insight into required training. These challenges were the results of several factors, among others:

- Relevant information being registered and managed in different independent systems (some of them simple Excel registers), by different people
- Many manuals processes that are time-consuming, require the involvement of many resources and cause unnecessary delays and risk of error
- Lack of centralized tool to collect and access training-related information like training needs and training history
- Lack of effective and user-friendly tool to plan and distribute all learning activities, including digital learning
- Outdated, complicated and parallel systems and user-interfaces hindering employee’s and their manager’s ability to effectively and proactively follow-up competency, especially compliance-related mandatory retraining, as well as access training

The solution chosen by NSB was to implement a powerful Learning Management System, fully integrated with its HR system, which was able to provide the following capabilities:

- Host a wide variety of learning content, including traditional classroom training, digital learning, digital exams and external courses, but also informal training like documents, task lists, quick-guides videos to support and encourage self-based training.
- Manage learning plans with curricula to handle complex certification retraining requirements, and with programs to ensure conformity in onboarding training of new employees
- Automated assignment profiles to ensure regulatory compliance and reduce safety risks by automatically assigning training tailored to an employee’s job, role and region
- Manage all aspects of training planning and administration, including booking of necessary resources like facilities, equipment and instructors, track cost as well as report on a wide array of metrics
- Provide easy, live access for supervisors, training managers and training planners to monitor certification or curricula status for their employees, assign new training, register employees to classes and review training results
- Provide easy, live access for instructors to view planned classes, assigned resources and student roster, and register training results
- Provide easy, live and mobile access for employees to view assigned learning and due-dates for retraining, access digital content, and complete digital exams and evaluations.
• Ensure all training-related information and all learning content is available through one shared interface, where roles, workflows and access are clearly defined and centrally managed

**WCRT Topics addressed in paper, First Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc

**Optional Second Topic**

Digitalization of training & learning solutions (including social media): success stories
32.

About the author

Name
CHERENE HUBERT

Position
Directeur UNIVERSITE TRANSILIEN

Company
SNCF

Email
hubert.cherene2@sncf.fr

Telephone
+33 (0)6 60 93 46 11

Abstract

Title
Formateur 4.0 : la professionnalisation des formateurs à l’heure du digital

List the key lessons or learning point that delegates will take away from the conference

Développer la professionnalisation des formateurs pour s’adapter aux nouvelles méthodes pédagogiques et à la digitalisation dans un soucis de parcours certifiant
+ La formation des formateurs : la formation continue par les pairs
+ L’acculturation et le développement des compétences digitales
+ Développement des compétences et articulation Ressource Humaine
+ La certification comme élément de reconnaissance

Abstract (no more than 500 words)

L’Université Transilien a vécu une transformation pédagogique et digitale durant les années 2017 et 2018. De nouveaux parcours de formation initiale ont été montés en collaboration avec un cabinet externe. Dans ce cadre, de nouvelles modalités pédagogiques ont été mise en œuvre afin d’obtenir un parcours en alternance plus rythmé en favorisant des méthodes créant le lien avec les activités des stages terrain. La mise en place des principes de la pédagogie inversée
a permis aux apprenants de s’interroger et de se confronter. Cela a dynamisé et redonné du sens au présentiél et permis de s’adapter aux différents styles et temps d’apprentissage. La décentralisation du savoir : le stagiaire mis au cœur de l’apprentissage c’est à la fois rendre acteur l’apprenant, personnaliser son parcours mais également faire évoluer la posture du formateur.

En parallèle un programme de digitalisation s’est déployé au sein de l’UTN. Il s’agissait de s’affranchir de certains matériels lourds qui nous bloquaient des salles et dont la maintenance était difficile avec le risque d’annulation de sessions de formation. Ces formations ont été transformées grâce à la réalité virtuelle augmentée. Les formateurs ont dû progresser dans les domaines digitaux pour intégrer ces nouvelles technologies. Enfin le travail de cohérence avec les formations dispensées sur le terrain par les formateurs d’établissement a transformé le rôle des formateurs de l’UTN en les positionnant comme formateur de formateur et animateur de communauté sur leurs domaines de compétences. Pour préparer au mieux ces différents changements nous avons établi un programme de montée en compétences basé sur l’acculturation, l’auto-formation, la formation par les pairs et un cursus de formations digitales. L’ensemble de ce parcours est certifiant voir diplômant afin de s’inscrire dans une ingénierie de parcours en cohérence avec la politique ressources Humaines de la société. Certaines actions sont certifiées par des badges de compétences (novice, avancé ou expert) délivrés par l’université numérique ou des prestataires externes reconnus. D’autres font l’objet d’un passeport de formation (passeport numérique). Cela garantit une traçabilité tant pour l’entreprise que pour le salarié.

En fin un processus de validation des Acquis de l’Expérience (VAE), permet aux salariés d’obtenir un diplôme de titre III (titre de formateur d’adulte) à I (master chef de projet digital) reconnu au Répertoire National des certifications Professionnelles (RNCP).

Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

Trainees (training, certification, development)

Optional Second Topic

New challenges, such as cross-cultural, inter-generational
33.

About the author
Name
BECAAS ALAIN
Position
Chef de Projet à la direction du Matériel
Company
SNCF
Email
alain.becaas@sncf.fr
Telephone
+33 620 034 458
Abstract
Title
GEQUI : une démarche vivante de Management des Compétences. Adaptation des compétences aux nouvelles charges de travail.

List the key lessons or learning point that delegates will take away from the conference
Nouvelles générations :
• Remplacement des effectifs vieillissants
• Caractère durable de la gestion des connaissances – transfert des connaissances ferroviaires à la nouvelle génération. Rôle de la formation.
Innovation et Technologies :
• Le ferroviaire numérique et son impact sur la fonction et les exigences de capacités. Comment former les nouvelles compétences ?
• Applications informatiques (standard ou spécifiques intra-entreprise) pouvant être utilisées pour aider à évaluer les besoins en formation, la formation en simulation, le développement et l’évaluation des compétences, la gestion de la formation
Cycle de gestion de la formation
• Analyse des besoins en formation
• Test/Examen/Évaluation/Certification
• Transfert d’apprentissage sur le lieu de travail
• Évaluation de la formation et retour sur investissement
Initiatives en matière de formation
• Développement des compétences pour les postes de la grande vitesse ainsi que pour les nouvelles fonctions

Abstract (no more than 500 words)

Définition commune des compétences pour le domaine et un management standardisé des compétences quelques soient les flux des personnels. Chacun reste porteur de ses compétences indépendamment des mutations.
SMEC : structuration de la montée en compétences, formation aux documents, formations académiques, adaptation au poste de travail, ECP, Maître Compagnon, Transmission des compétences, formalisation, Matrice de compétences, outil de management des compétences ouvert pour toutes compétences transverses, standardisation pour comparaison de la performance des montées en compétences, indicateurs de pilotage à tous les niveaux pour la prise de décision : Direction générale, direction des Technicentres, direction des unités opérationnelles et équipes de production.
GEQUI est interconnecté dans un écosystème qui facilite l’administration de l’ensemble des items qu’un manager doit gérer.
Le catalogue des formations académiques est disponible dans GEQUI pour les managers dans la construction de leurs référentiels de compétences. Un filtre permet de voir les seules formations utiles en fonction du profil du poste.
GEQUI intègre la gestion documentaire des collections d’équipe. Le suivi des dernières évolutions permettent de se mettre à jour des informations par la formation aux documents (diffusion documentaire), acte de formation du sachant vers l’apprenant sur le terrain.
Chaque manager avec GEQUI organise l’adaptation au poste de travail. La formalisation est réalisée en collaboration avec le Maître Compagnon. Cette formation au poste de travail est valorisée dans le bilan formation.
C’est le Maître Compagnon, agent de l’équipe qui accompagne son collègue pour l’acquisition du savoir, du savoir être et bien sûr du savoir-faire d’une manière concrète en réalisant des gestes métier sous contrôle.
Les formations académiques, la diffusion documentaire, l’adaptation au poste de travail, l’ECP sont associés à la compétence. Le Maître Compagnon est l’acteur clé de la transmission
des compétences.
Toute la structuration de la montée en compétence est tracée. Une photographie de l’ensemble des compétences à disposition pour la production est faite sur une matrice de compétences à 4 niveaux. L’ensemble sera détaillé. Tous les niveaux sont justifiés par la traçabilité. Lorsque les compétences sont liées à des obligations légales, le statut et les dates de péremption sont indiqués.
Pour finir, des indicateurs sont visibles dès l’ouverture de l’outil pour aider le manager à prendre les décisions dans le pilotage des compétences. Nous les avons adaptés à tous les étages de la hiérarchie : opérationnel, tactique et stratégique. Plus les managers mettent en œuvre la démarche, utilisent l’outil, plus ils gagnent en maturité sur le management des compétences. La conduite partagée, par le manager et par les responsables RH, des compétences suit les besoins d’évolution, de production.

Abstract in English (no more than 500 words)

Means : innovative approach and its computer and digital tool.
Common definition of skills for maintenance and standardized management of skills regardless of the flow of personnel. Everyone keeps his skills regardless of position changes.
SMEC : structuring skills development, document training, academic training, workplace adaptation, ECP, Master Companion, skills transfer, formalization, skills matrix, open skills management tool for all cross-functional skills, standardization for comparison of performance and skills upgrades, steering indicators at all levels for decision-making :
General Management, Technicentres Division, management of operational units and production teams.
GEQUI is interconnected in a software ecosystem that facilitates the administration of all items a manager must manage.
The catalog of academic courses is available in GEQUI for managers in the construction of their competency frameworks. A filter makes it possible to see the only formations useful according to the profile of the position.
GEQUI integrates document management for team library. Monitoring the latest developments can update information by training through documents (dissemination documentary), training act knowing the learner in the field.
Each manager with GEQUI organizes the adaptation to the workstation. The formalization is carried out in collaboration with the Master Companion. This training of an employee in a workplace is valued in the training report.
It is the Master Companion, agent of the team too, who accompanies his colleague for the acquisition of knowledge, the knowledge to be and, of course, the know-how in a concrete way, by carrying out business gestures under control.
When the agent is ready for autonomy on the skill, the manager organizes a Skills
Assessment at the Workstation (ECP). This makes it possible to check the correct application of the maintenance rules. The "job" gestures and the attitudes are controlled before leaving the agent in autonomy on the tasks entrusted.

Academic training, documentary dissemination, workplace adaptation, and ECP are associated with talents. The Master Companion is the key player in the transmission of skills. All the structuring of the rise in competence is traced. A photograph of all skills available for production is made on a matrix of skills at 4 levels, with full details. All levels are justified by traceability. When skills are related to legal obligations, the status and expiry dates are indicated.

Finally, indicators are visible as soon as the tool is opened to help the manager make the decisions in the skills management. We have adapted them to all levels of the hierarchy: operational, tactical and strategic. The more managers implement the approach, use the tool, the more they mature in the management of skills. The shared management, by the manager and by the HR managers, of the skills follows the needs of evolution and of production.

**WCRT Topics addressed in paper, First Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc

**Optional Second Topic**

Transfer of learning to the workplace
34.

About the author

Name
KOUMFIEG Olivier

Position
Directeur de Transport

Company
CAMRAIL

Email
olivier.koumfieg@camrail.net

Telephone
+237 696290485

Abstract

Title
Analyse des besoins en formation

List the key lessons or learning point that delegates will take away from the conference

Sujet : Analyse des besoins en formation
Domaine d’application : Réseau ferroviaire subsaharien

Phase 01 : Collecte et identification des besoins
Phase 02 : Etude des besoins de formation
Phase 03 : Elaboration d’un plan de formation

Abstract (no more than 500 words)

Le transport ferroviaire au Cameroun, est en concurrence avec d’autres modes de transport : la route et les airs. Dans le même temps, l’érosion des compétences du aux départs massifs à la retraite des personnels de l’ex-REGIFERCAM a entrainé un déficit de compétences perceptible sur la qualité de ses prestations.

Afin de rester compétitive sur le marché du transport des biens et des personnes vers l’hinterland sans recourir à des investissements importants, hors de sa portée au regard de sa santé financière et des projets de modernisation engagés, la société CAMRAIL,
concessionnaire des chemins de fer du Cameroun, a misé sur la formation pour renforcer sa qualité de service.

Ce choix stratégique est né du constat selon lequel la qualité des services offerts à sa clientèle était altérée par des dysfonctionnements dont les causes étaient, très souvent, d’origine humaines.

Néanmoins, pour constituer un véritable levier d’amélioration de la qualité de service et de la productivité globale de l’entreprise, les besoins en formation devaient être bien identifiés en prenant en compte les évolutions économique, sociale (rajeunissement de son personnel) et technologique auxquelles était confrontée l’entreprise. Les besoins ainsi identifiés devaient en outre faire l’objet d’une mise à jour permanente de manière à être en permanence en cohérence avec les réalités de l’entreprise ainsi que les besoins de son exploitation.

Notre exposé se propose de partager le retour d’expérience de CAMRAIL sur la question d’analyse des besoins de formation. Pour ce faire, les trois (03) phases de son mécanisme d’analyse des besoins en formation seront abordées :

- Phase 1 : Collecte et identification des besoins ;
- Phase 2 : Etude des besoins de formation ;
- Phase 3 : Elaboration d’un plan de formation.

L’objectif étant de répondre à la question « comment assurer un service de qualité qui permettra d’éradiquer les malfaçons constatées dans tous les domaines techniques, dues à un défaut de compétences ? », une analyse des résultats obtenus sous le prisme des principaux indicateurs ci-après sera également proposée :

- Indicateurs de sécurité ;
- Indicateurs de satisfaction de la clientèle ;
- Indicateurs de performance opérationnelle.

Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

Training Needs Analysis

Optional Second Topic

Training design
About the author

Name
Martine de Jong - van Opijnen

Position
Programm manager

Company
ProRail

Email
martine.dejong@prorail.nl

Telephone
+31655847143

Abstract

Topic:
Training Management Cycle - Training design
Training Initiatives - Development of competencies for HS jobs as well as new jobs

Scope of the subject:
Professional craftmanship is required to realise the defined vision of ProRail. Increasing mobility, new technology and choices made in methods, require another way of training and developing employees. To achieve defined goals, ProRail needs professional employees who learn and constantly evaluate, who are endurably compliant to qualification programs (Ministry and ProRail), who act on the basis of knowledge and insight and who take responsibility.

Issues

ProRail Vakopleidingen, the educational department of traffic control, is responsible for training the employees of the traffic control department. From 2010 till now, they have worked on developing training for train dispatchers and train regulators, they built retraining programs for both functions, trained senior-workers to facilitate learning at the workspace and supported the implementations of new methods or systems.
All products are designed based on the following:
- Employees are responsible to maintain craftsmanship;
- Smart qualification programs; Required knowledge, skills and comprehension of operational processes
- Clear difference between training-retraining - training new knowledge and between learning (mistakes allowed) and qualification (suitable for the job)
- 70-20-10-rule ; Employees learn 70 % on the job experience, 20 % by informal learning and 10 % by formal learning
- Knowledge and competence-development are integrated; employees can apply gained knowledge and skills at their own workspace
- Training in non-technical skills for raising craftsmanship and competence development
- Blended learning

Recently, management has decided to expand activities by ProRail Vakopleidingen. The educational department is going to develop a program for training employees in mixed groups at logistic processes (to improve performance in operation) and will take responsibility in using a new simulator by testing planned changes (to avoid waisted investments and a performance dip during implementation phase.

Objectives/outcome

We want to share:
- The design of our training for traindispatchers
- Our retraining program for traindispatchers; all tasks of a traindispatcher categorized (based on the impact on safety and how often a task is executed in daily operation) and translated to a 4 year cycle
- Our challenges with employees and trainers by changing old methods and difficulties in self-reflection
36.

About the author

Name
Claire WINE

Position
Simulation project manager for signalling control unit

Company
SNCF RESEAU

Email
claire.wine@reseau.sncf.fr

Telephone
+33 (0)6 23 54 83 82

Abstract

Title
Mistral Evolutif Simulator (SMILE) for traffic operators’ training

List the key lessons or learning point that delegates will take away from the conference

► What use for simulation to train traffic operators ?
► How to ensure tools’ scalability in the design of the solution ?
► Wich other purposes can a simulator be used for ?

Abstract (no more than 500 words)

Suite aux graves incidents ferroviaires de la fin des années 80 en France, la nécessité de mieux préparer et entrainer les opérateurs devient une priorité de la SNCF. Action d’imiter, de copier, de reproduire un système, la simulation est alors mise en lumière comme moyen de formation indispensable car permettant la mise en situation réelle des agents sans impact pour le trafic. Au sein de la branche exploitation des circulations, une équipe projet est montée et des simulateurs de poste d’aiguillage tel GESSIE (poste électromécanique) et MAESTRO (postes à relais) sont développées. A la fin des années 90, les déploiements de ces outils s’achevant, cette dynamique est interrompue dans sa lancée.
Depuis quinze ans, seules des initiatives locales ou la livraison de répliques de poste dans le cadre de déploiements spécifiques ont permis de faire perdurer le parc de simulateurs. Mais force est de constater qu’en l’absence d’un pilotage centralisé, l’offre de moyen de formation n’a pas suivi l’évolution des technologies et des métiers. Certains simulateurs se trouvent donc être inadaptés - si non obsolètes - à l’entrainement des opérateurs voire dans certains cas inexistants. Ce constat fait, une seconde équipe est formée en 2015 afin de moderniser l’offre d’outils de formation aux postes d’aiguillage avec cette fois l’objectif de les pérenniser et de démocratiser leur utilisation.

Outre la migration des premiers simulateurs pour répondre aux besoins immédiats des opérateurs, le renouvellement des outils de formation comprend surtout la création de nouveaux simulateurs. Le premier projet lancé en ce sens est celui du Simulateur MIstral Evolutif (SMILE) pour la formation à la tenue d’un poste sous IHM* Mistral. Le premier simulateur SMILE est installé fin 2018. Basé sur la solution BEST de la société Scheidt & Bachmann, il est pensé afin que soit permis une évolutivité vers d’autres technologies de postes - existants comme à venir - et intègre un module de saisie de plans de voie par l’équipe SNCF. Il est d’ores et déjà choisi comme outil de formation dans le cadre de mises en service de nouveaux postes Mistral ainsi que des futurs postes Mistral Nouvelle Génération en cours de développement. Il dispose également de fonctionnalités pédagogiques avancées et favorise l’autonomie des opérateurs en leur permettant une utilisation de façon indépendante.

Si aujourd’hui le simulateur SMILE de la SNCF est dédié à la formation et l’entrainement de l’opérateur, la conception de l’outil permet d’imaginer d’autres usages : utilisation pour les essais systèmes en amont d’une mise en service, test des plans de transports, intégration avec la gestion des circulations, etc. De même que la constitution d’une équipe en charge de la gestion du parc de simulateurs permettra désormais de garantir son évolutivité, la diversification des applications offre aussi la perspective de renforcer son ancrage au sein du système d’exploitation ferroviaire de la SNCF, évitant ainsi les écueils passés.

Abstract in English (no more than 500 words)

Following the serious rail incidents of the late 1980s in France, the need to better prepare and train operators becomes a priority for SNCF. Action of imitating, copying, reproducing a system, the simulation is then highlighted as an essential means of training because allowing the agents to experience a real situation without impact for traffic. Within the traffic management branch, a project team is set up and signalling control station simulators such as GESSIE (electromechanical control units) and MAESTRO (relay control units) are developed. At the end of the 90s, the deployments of these tools coming to an end, this dynamic is interrupted in its momentum.
For the last fifteen years, only local initiatives or the delivery of replica substations for specific deployments have made it possible to maintain the simulator fleet. But it is clear that in the absence of centralized management, the offer of training means has not kept pace with the evolution of technologies and missions. Some simulators are therefore inadequate - if not obsolete - in the training of operators - even in some cases non-existent. This observation made, a second team is formed in 2015 to modernize the offer of training tools with the goal of perpetuate and democratize their use.

In addition of the migration of the first simulators to meet the operators’ immediate needs, the renewal of training tools includes the creation of new simulators. The first project launched in this direction is the MIstral Evolutif Simulator (SMILE) for training to hold a position under HMI Mistral. The first SMILE simulator is installed at the end of 2018. Based on the BEST solution from Scheidt & Bachmann, it is designed to allow scalability to other control stations technologies - existing and future - and integrates a data entry module to allow SNCF teams to implement new track plans. It has already been chosen as a training tool for the commissioning of new Mistral control units as well as future Mistral New Generation signalling control station under development. It also has advanced educational features and promotes operator autonomy by allowing them to use the simulator independently.

If today the SMILE simulator of the SNCF is dedicated to the training and learning of the operator, the design of the tool makes it possible to imagine other uses: to tests a system before a commissioning, to test transport plans, integration with traffic management, etc. As the creation of a team in charge of the management of the fleet of simulators will now ensure its scalability, the diversification of applications also offers the prospect of strengthening its anchoring within the railway operating system of the SNCF, avoiding thus past pitfalls.

**WCRT Topics addressed in paper, First Topic**

Software applications (standard or in-company specific) which may be used to help on training needs assessment, simulation training, competencies development and evaluation, training management, etc

**Optional Second Topic**

Digitalised railway and the impact on job role and skill requirements. How to train the new competencies?
37.

About the author

Name
Christophe MARTIN

Position
Directeur Général

Company
IFF - Institut de Formation Ferroviaire

Email
christophe.martin@sncf.fr

Telephone
+212 (0) 6 63 21 94 32

Abstract

Title
PREPARING FOR THE OPERATION OF AFRICA’S FIRST HIGH-SPEED LINE - TRANSFERRING SKILLS AND BUILDING EXPERTISE

List the key lessons or learning point that delegates will take away from the conference

A success based on close cooperation between IFF, SNCF & ONCF
  ➤ A significant design work, necessary for tailored training
  ➤ An exceptional mobilization in the last 12 months to train more than 1300 people

Abstract (no more than 500 words)

Né de la volonté des deux Entreprises SNCF et ONCF de nouer un partenariat durable au-delà de la construction de la Ligne à Grande Vitesse Maroc, l’Institut de Formation Ferroviaire a eu pour mission de former les personnels de l’ONCF à l’exploitation de la Grande Vitesse au sens large.

L’ensemble des personnels concourant au fonctionnement opérationnel du nouveau produit ont ainsi pu apprendre à l’IFF les bases de l’exploitation, de la maintenance et du service client associé.
Plus largement la coopération Franco Marocaine sur le projet a intégré le transfert des compétences nécessaires à la maîtrise de la Grande Vitesse.

Ainsi, dès 2016, des immersions longues de cadres ONCF dans les établissements SNCF ont permis d’amorcer un transfert de compétence visant à donner à terme à l’ONCF une complète autonomie dans le processus de formation, en premier lieu dans le domaine de la conduite.

2017 a permis d’amorcer l’ingénierie de formation « exploitation » avec les partenaires SNCF et ONCF au fur et à mesure de la définition des règles techniques d’exploitation : la particularité du projet est que les spécificités locales ont été prises en compte dans la conception des règles d’exploitation et de maintenance.

En 2018, la conception s’est étendue au domaine du service en gare et à bord des trains :

Pour atteindre l’objectif fixé, l’IFF a reçu enfin le concours d’une « task force » dédiée au cours de l’année 2018 pour la conception et la diffusion de modules de formation adaptés au contexte local et au service à réaliser.

Ainsi, SNCF Réseau et SNCF Mobilités ont conçu plus de 15 modules de formation spécifiques, et ont mobilisé plus de 30 formateurs au cours du premier semestre 2018.

IFF de son côté, sollicité par la société en charge de la maintenance des Rames à Grande Vitesse, a développé, en appui avec l’expertise SNCF, des parcours de qualification des techniciens de maintenance du matériel, adaptés aux contraintes du centre de maintenance.

Plus de 1300 agents ont été formés :

- conducteurs (en utilisant au maximum les possibilités offertes par le simulateur de conduite sur lequel la LGV est totalement modélisée)
- agents de maintenance de l’infrastructure (avec études pratiques sur le terrain, notamment grâce à un chantier-école pour la caténaire)
- agents de maintenance du matériel à Grande Vitesse (immersion en France dans les centres de maintenance pour un certain nombre de cadres)
- agents du contrôle
- vendeurs
- agent des escales

A la fin de l’été 2018, l’ensemble des personnels nécessaire à l’exploitation du nouveau service est ainsi opérationnel.

Abstract in English (no more than 500 words)
Born from the will of both SNCF and ONCF (Moroccan Railways) to build a lasting partnership beyond the construction of the High Speed Line Morocco, the Railway Training Institute was tasked to train ONCF staff to High speed operation in the broad sense.

All personnel involved in the operational operation of the new product have thus been able to learn from the IFF the basics of operation, maintenance and associated customer service.

Moreover, Franco-Moroccan cooperation on the project has integrated the transfer of skills necessary for the control of high speed

Thus, in 2016, long immersions of ONCF managers in the SNCF establishments led to the start of a transfer of competence aimed at giving the ONCF full autonomy in the training process, first and foremost in the field of training conduct.

2017 has made it possible to start the "operating" training engineering with the SNCF and ONCF partners as and when the technical operating rules are defined: the particularity of the project is that the local specificities have been taken into account in the design of the operating and maintenance rules.

In 2018, the design extended to the fields of stations and train service.

To reach the set objective, the IFF finally received the assistance of a dedicated task force during the year 2018 for the design and distribution of training modules adapted to the local context and the service to be provided.

SNCF Réseau (Network) and SNCF Mobilités (Mobilities) designed from 2017 more than 15 specific training modules and mobilized more than 30 trainers in the first half of 2018.

IFF on its side, requested by the company in charge of the maintenance of high-speed trains, has developed, in support with SNCF expertise, qualification courses for equipment maintenance technicians, adapted to the constraints of the maintenance center.

More than 1300 agents have been trained within less than 12 months:

- drivers (making maximum use of the possibilities offered by the driving simulator on which the LGV is fully modeled)
- infrastructure maintenance staff (with practical field studies, including a catenary schoolyard)
- high-speed equipment maintenance agents (immersion in France in maintenance centers for a certain number of executives)
- control agents
- sellers
- stopover agents
This permitted all the personnel required to operate the new service to be operational by the end of summer 2018.

**WCRT Topics addressed in paper, First Topic**

International co-operation between companies

**Optional Second Topic**
38.

About the author

Name
Anjum Naweed

Position
Associate Professor

Company
Central Queensland University

Email
anjum.naweed@cqu.edu.au

Telephone
+61 8 8378 4520

Abstract

Title
Staying in tune : Non-technical skills the promote teamwork in network controller and train driver interactivity

List the key lessons or learning point that delegates will take away from the conference

Effective training for train controllers is important for supporting sustainable, dynamic and timely safety management activity across the network.

Train controlling is one of the most important roles in rail. Currently, the industry is experiencing high turnover, meaning that loss of staff has become a critical concern. This will affect businesses in terms of retaining necessary expertise, but also ensuring there is an adequate number of train controllers to mean service delivery needs. Understanding non-technical skills dimensions in train controlling will help develop the workforce and promote retention.

The trend for digital railways (e.g. driverless trains, remote condition monitoring) also means that the traditional train controller role is evolving. Train controllers are likely to become rail safety managers, as tasks become more automated, meaning non-technical skills associated with situation awareness, conscientiousness and self-management (to name but a few) will
become more critical to the role. Capturing this knowledge means we will be able to anticipate looming changes.

This research is the first to identify substantive non-technical skills for train controlling, and the first to produce a specific non-technical skills framework for this task.

Abstract in English (no more than 500 words)

In many rail systems, the person(s) within the train cab physically operate the train, but only do so through close communication with network controllers. In reality therefore, a “team” drives a train, where the driver and the controller must work and behave as a distributed system. However, the synergy in teamworking across time and space can often be disrupted and/or distorted by other factors; in practice, their roles require good “non-technical” skills to maintain their integrity as a team. These are social, cognitive and personal skills that enhance how technical skills, tasks and procedures are carried out, and can assist in learning how to deal with different situations.

While a number of non-technical skills frameworks exist for those who operate trains and maintain track, no such formalized non-technical skills framework has been developed for train controllers. Understanding what non-technical skills are critical for train controllers will not only support the resourcing and training needs of the workforce, it will also improve operations management and system safety. Importantly, it will also go some way towards identifying what non-technical skills are needed as the controller role continues to evolve.

This study drew on a qualitative phenomenographic approach to obtain rich insight into the decision process, experiences, perceptions and opinions of train controllers. Semi-structured one-to-one interviews were used to elicit knowledge and support the application of a method called the Scenario Invention Task Technique (SITT); a generative simulation task, the SITT combines principles of multi-pass retrospective inquiry from the Critical Decision Method and story-telling approach from the Rich Picture Data method to externalize decision-making in complex work.

A total of 55 train controllers (51 male; 4 female) ranging from 22-67 years of age (M = 45.5, SD = 11.1) were recruited from 8 participating rail organizations across Australia & New Zealand, including Perth (Western Australia), Brisbane (Queensland), Sydney (New South Wales), Melbourne, (Victoria), Adelaide (South Australia); Launceston (Tasmania), and Wellington (NZ). Most participants had more than 10 years of experience (M = 15.83, SD = 12.18).

Based on a preliminary analysis of non-technical skills deficiency identified within scenarios, a number of non-technical skills are highly relevant for train controlling. Skills, for example,
associated with situation awareness (i.e., being aware of what is going on around you so that
you are able to anticipate what could happen in the future); conscientiousness (i.e.,
tendency to be careful, thorough, reliable and systematic when approaching tasks;
communication (i.e., ability to communicate effectively through verbal and non-verbal
means and stand your ground as necessary); self-management (i.e., having the motivation
and appropriate level of confidence to do the job well), recur as critical non-technical skills.
However, skills such as leadership (i.e., how people are organized to work together, how
they relate to each other and influence each other), are also important, and absent from the
non-technical skills framework.

**WCRT Topics addressed in paper, First Topic**

Safety risk culture (personnel & customer safety/railway safety)

**Optional Second Topic**

Human factors and training
39.
40.

About the author
Name
Duvenci-Langa& Mohamed FATHI
Position
Experte FOH / Chef département sécurité
Company
SNCF/ ONCF
Email
stella.duvenci-langa@sncf ;fr / fathi@oncf.ma
Telephone
0603486604 / 0537774747
Abstract
Title
Collaboration entre deux entreprises ferroviaires pour un développement d’une culture de sécurité positive
List the key lessons or learning point that delegates will take away from the conference
culture de sécurité, management, facteurs organisationnels et humains
Abstract (no more than 500 words)
Le sujet présenté dans cette communication rend compte d’une collaboration entre deux entreprises ferroviaires afin de faire profiter l’ONCF de l’expérience de la SNCF sur le développement d’une nouvelle culture de sécurité.
La collaboration s’est déroulée en deux phases :
1) La 1ère phase (mars-juin 2016) consistait en la conception et la réalisation des formations pour l’ensemble de l’encadrement de l’ONCF, des membres du COMEX jusqu’aux DPX.
L’objectif principal de ce module était de renforcer les comportements de sécurité par l’appropriation de la culture positive de sécurité ainsi que sa mise en œuvre. Pour ce faire, la formation avait comme objectif de :
a. Renforcer la prise de conscience individuelle et collective de l’importance et l’intérêt
d’une démarche de culture de sécurité en tant que démarche ayant fait ses preuves dans plusieurs domaines ;

b. Mettre en évidence et partager les changements de pratiques nécessaires pour l’implémentation d’une culture positive de sécurité ;

c. Encourager la culture de remontée de l’information et de feedback

d. Promouvoir la culture d’apprentissage pour une meilleure identification des menaces qui mettent en danger la sécurité et les changements nécessaires pour y remédier et Instaurer la culture juste pour pouvoir distinguer d’une façon claire entre les actes acceptables et les actes inacceptables vis-à-vis de la sécurité ferroviaire ;

Ces formations se sont déroulées sur une journée en présentiel et en moyenne 300 cadres ont été formées.

2) La 2ème phase est intervenue une année plus tard (septembre 2017).

L’ONCF, dans le cadre de la poursuite du déploiement du système de management de la sécurité a souhaité organiser une formation des formateurs internes qui se chargeront de la duplication de la formation relative à l’appropriation de la culture positive de sécurité ainsi que sa mise en œuvre. Cette formation devrait permettre aux stagiaires :

a) de bien maitriser les concepts et la démarche de culture positive de sécurité,

b) d’être en capacité de produire les supports des formations ultérieures qu’ils auront à assurer au profit de personnel opérationnel ;

c) d’être en mesure d’évaluer l’appropriation de la démarche culture de sécurité dans leurs domaines d’activité.

Deux sessions de formation ont été réalisées. Une vingtaine de collaborateurs des pôles opérationnels sélectionnés par l’ONCF pour animer les séances de formation ont suivi la formation sur 2 journées consécutives.

Une synthèse des évaluations par les formateurs a mis en évidence la motivation des stagiaires pour déployer ou de faire déployer les connaissances acquises au niveau des opérateurs. Un autre enseignement important de cette formation a été la clarification et la compréhension des liens entre le SMS et l’approche FOH au travers des différents thèmes abordés tels que : la conscience des risques, le rôle des règles dans la maîtrise des risques, l’analyse des écarts aux procédures, la performance humaine…

Enfin, l’hétérogénéité des groupes des différents métiers a permis de prendre conscience de l’importance d’une vision système de la sécurité.

Version anglaise :

WCRT Topics addressed in paper, First Topic

International co-operation between companies
Optional Second Topic
Management and leadership development

Abstract

Title

Collaboration between two railway companies for the development of a positive safety culture

List the key lessons or learning point that delegates will take away from the conference

Safety culture, management, Human factors

Abstract in English (no more than 500 words)

The subject presented in this communication reports on a collaboration between two railway companies in order to give ONCF the benefit of SNCF's experience in developing a new safety culture.

The collaboration took place in two phases:

1) The 1st phase (March-June 2016) consisted of the conception and the realization of trainings for the whole of ONCF’s management, from the members of the COMEX to the DPX. The main objective of this module was to reinforce safety behaviors through the appropriation of the positive safety culture and its implementation. To do this, the training aimed to:
   a) Reinforce individual and collective awareness of the importance and value of a safety culture approach as a proven approach in several areas;
   b) Highlight and share the practice changes needed to implement a positive safety culture;
   c) Encourage the culture of information feedback, their treatment and communication;
   d) Promote the learning culture to better identify threats that endanger security and the changes needed to address them
   e) Establish fair culture so that there is a clear distinction between acceptable and unacceptable acts with respect to railway safety;

These trainings took place on a day in the classroom and on average 300 managers were trained.
2) The 2nd phase took place one year later (September 2017).

ONCF, in the framework of the continued deployment of the safety management system, wished to organize a training of internal trainers who will be responsible for duplicating the training on the appropriation of the positive safety culture. These internal trainers will be responsible for training and implementing the necessary practices.

This training should allow trainees:

a) to master the concepts and the approach of positive safety culture,

b) to be able to produce the materials for subsequent training to be provided to operational staff;

c) to be able to assess the appropriation of the safety culture approach in their areas of activity.

Two training sessions were conducted. Some 20 employees from the operational centers selected by the ONCF to facilitate the training sessions followed the training on 2 consecutive days.

A summary of evaluations by the trainers highlighted the motivation of the trainees to deploy or deploy the knowledge acquired at the operator level. Another important lesson of this training was the clarification and understanding of the links between the SMS and the FOH approach through the various topics discussed such as: risk awareness, the role of rules in risk management, analysis of procedural deviations, human performance ...

Finally, the heterogeneity of the groups in the various business lines made it possible to become aware of the importance of a system vision of security.

**WCRT Topics addressed in paper, First Topic**

International co-operation between companies

**Optional Second Topic**

Management and leadership development
About the author

Name
Virginia Infante / Jeannette Edler

Position
Professor

Company
Instituto Superior Tecnico

Email
virginia.infante@tecnico.ulisboa.pt

Telephone
+351917664048

Abstract

Title
Training schemes for low, medium and high skilled job opportunities in all transport modes

List the key lessons or learning point that delegates will take away from the conference

Training Needs Analysis ; Training design

Abstract (no more than 500 words)

The purpose of SKILLFUL project was to identify and propose new business roles in the education and training chain, in particular those of “knowledge aggregator”, “training certifier” and “training promoter”, in order to achieve European wide competence development and take-up in a sustainable way. During the last few years, major companies in the sector became conscious that there was a need to provide transport expertise to fresh graduate students before their recruitment by Industry. From a questionnaire on the prioritized trends, professions to be changed and emerging professions, the fields of specialization are identified and treated for knowledge transfer processes and subsequent training schemes/courses purposes for all transport modes. The training schemes/courses were divided by : Transport infrastructure operators’ training ; Transport infrastructure and systems operators webinars ; Young scientists’ seminars ;
Lifelong training schemes for low to middle-skilled segments of transport professionals; Interdisciplinary thematic courses on key technologies, services and trends; Towards a pan-European Transport master curriculum.

Training and Education Activities for low, medium and high skilled jobs can be targeted to all kind of transport stakeholders in order develop competences standardized or recognized at international level enabling to comply with EU international requirements and legislation and also with the high tech innovations under development/implementation in transport services.

The creation and development of a portfolio of training courses for low, medium and high skilled jobs constitutes a benchmark for the transport training system aiming to create professional profiles able to operate in the technological changes provided recently by the signalling, communication, IT system.

Abstract in English (no more than 500 words)
The purpose of SKILLFUL project was to identify and propose new business roles in the education and training chain, in particular those of “knowledge aggregator”, “training certifier” and “training promoter”, in order to achieve European wide competence development and take-up in a sustainable way. During the last few years, major companies in the sector became conscious that there was a need to provide transport expertise to fresh graduate students before their recruitment by Industry.

From a questionnaire on the prioritized trends, professions to be changed and emerging professions, the fields of specialization are identified and treated for knowledge transfer processes and subsequent training schemes/courses purposes for all transport modes. The training schemes/courses were divided by: Transport infrastructure operators’ training; Transport infrastructure and systems operators webinars; Young scientists’ seminars; Lifelong training schemes for low to middle-skilled segments of transport professionals; Interdisciplinary thematic courses on key technologies, services and trends; Towards a pan-European Transport master curriculum.

Training and Education Activities for low, medium and high skilled jobs can be targeted to all kind of transport stakeholders in order develop competences standardized or recognized at international level enabling to comply with EU international requirements and legislation and also with the high tech innovations under development/implementation in transport services.

The creation and development of a portfolio of training courses for low, medium and high skilled jobs constitutes a benchmark for the transport training system aiming to create professional profiles able to operate in the technological changes provided recently by the signalling, communication, IT system.

WCRT Topics addressed in paper, First Topic: Training design

Optional Second Topic: Training Needs Analysis
42.

About the author

Name
Jacqueline Ridder

Position
Program Manager

Company
ProRail

Email
jacqueline.ridder@prorail.nl

Telephone
0031652784733

Abstract

Title
How ProRail improved the dispatcher course by using 4C/ID model, CRM techniques and cooperation with Recruitment

List the key lessons or learning point that delegates will take away from the conference

How can we improve our course for dispatchers and use up to date educational design methods, like the 4C/ID model (=how to teach complex skills)and “Crew Resource Management” techniques?

How can we improve the success rate of the course, working closely with the Recruitment department?

Experiences, lessons learned and new challenges from 2015 to 2018

Abstract (no more than 500 words)

Our educational department has educated more than 250 new dispatchers in the past 7 years. When the traffic train dispatchers start, they have no knowledge or experience in the railway sector; in about 9 months they will be ready for their job at the workplace.

In 2014, we decided to change our course fundamentally, after a LEAN project with participants from management, workplace and the educational department. The main
problem we had was that the course was partly organized at our simulation center and partly at the workplace. As it turned out, teaching at the workplace was difficult and complicated and our trainees didn’t get the attention they needed. It was also difficult to create to create good training conditions.

Together with the trainers and the coaches who teach our trainees at the workplace, we made a new course design, based on the 4 Components Instructional Design model. This is a model designed to teach complex skills, based on experiences with air traffic controllers. In this presentation we will explain how we applied this model, based on real life situations at the workplace which become more and more difficult as the course continues. Also, we will explain what it meant to our trainers and our learning & development staff.

After 3 years of experience, we are still looking for ways to improve our design, together with the trainers and L&D staff, so they can apply it in the course. Recently, we have started to integrate the Non-technical Skills from the Crew Resource Management training, well known in the air traffic industries and hospitals. This method aims to prevent safety risks by acknowledging your personal pitfalls such as lack of assertiveness, communication or lack of accuracy. We work very closely together with our recruitment department to recruit trainees with the right personality and capacities. From experience, we know that trainees should be able to reflect on their own actions and change non-adequate behavior.

Objectives/outcome
Predictable course planning, effective cooperation with the production department, and in 2015 and 2016: a higher success rate, from 50 to 65% !

New challenges: due to labor market changes the success rate has declined and recruiting new trainees has become harder. We are facing this challenge again together with HR and management to get a better result !

**WCRT Topics addressed in paper, First Topic**

Training design

**Optional Second Topic**

Training evaluation and return on investment
43.
Promoting wellbeing in an ageing workforce: 2015 Clara’s DB program follow up

List the key lessons or learning point that delegates will take away from the conference

Wellbeing training program
DB Clara’s program follow up in Portugal

Abstract in English (no more than 500 words)

Bottmann and Blöhm (2015) shared with 4th World Congress on Rail Training participants held in Berlin the DB program “CLARA – Clever and actively towards old age”. Maintaining mental and physical indexes and capacity to work among an ageing workforce were the business case main messages. IP human capital features are quite similar to DB’s. Holding 3700 employees, mean age of 50,3 years, mean tenure of 23,5 years, very low turnover levels and hiring freeze policies for the last 10 years, make wellbeing training programs quite appropriate for IP aged population. IP established a partnership with a university which has special competences in health psychology and start delivering a wellbeing program in 2018. Results will be shared with the participants, highlighting customizations and adaptations
needed to be done considering IP population and other context specificities. Lessons learned from IP Program will be shared with companies that wish to implement similar programs.

WCRT Topics addressed in paper, First Topic

Training supporting sustainable development

Optional Second Topic

New challenges, such as cross-cultural, inter-generational
Abstract

Learning transfer evaluation practices and methodologies
Empirical results of 3 years long program studying learning transfer efforts
Portuguese adaptation of the Learning Transfer System Inventory (Holton, Bates & Ruona, 2000)

Abstract in English (no more than 500 words)

IP Academy was created 5 years ago and runs annually 130,000 training hours (18,500 days) for its 3,700 employees. Training evaluation procedures are in place for first and second levels (Kirkpatrick, 1954, 1996). Level three evaluation – learning transfer – initiatives were quite erratic and difficult to implement for several reasons. Based on the instrument developed by Holton, Bates and Ruona (2000) - Learning Transfer System Inventory – LTSI – IP started in 2016 a study to adapt the inventory to its specific needs. The paper wishes to present the empirical results of this study conducted along 2016 – 2018 period. An adapted
version of the LTSI was developed and learning transfer data collected twice within a period of 3 years. Training transfer requirements and results are discussed.

**WCRT Topics addressed in paper, First Topic**

Transfer of learning to the workplace

**Optional Second Topic**

Training evaluation and return on investment
46.

About the author

Name
Moha khaddour

Position
Directeur

Company
CIFDD (Conseil Ingenierie Ferrovaire et Développement Durable

Email
moha.khaddour@gmail.com

Telephone
00212661179596

Abstract

Title
Adaptation de la Formation au besoin des acteurs du Ferroviaire : Approche d’évaluation de la formation sur l’amélioration la sécurité

List the key lessons or learning point that delegates will take away from the conference

- un bon diagnostic de la situation existante ;
- objectif à atteindre ;
- conception du plan d’action ;
- les moyens humains et matériels à mettre en œuvre pour réaliser les plans d’actions ;
- audit in situ auprès des acteurs formés en sécurité ;
- indicateurs pertinents d’évaluations de l’apport de formation pour les acteurs de sécurité.

Abstract (no more than 500 words)

Cette présentation a pour objectif de passer en revue le cycle de formation dans le domaine du transport ferroviaire. Sachant que le métier ferroviaire est très complexe par la grande diversité de ses composantes : infrastructure, le matériel roulant, l’exploitation et les métiers supports.
Bien que les métiers supports (Ressources humaines, les finances, les systèmes d’informations, et le juridique) soient la plupart du temps des acquis en dehors des entreprises ferroviaires, leur adaptation aux spécifiés de ce métier est indispensable.

Par contre, la maîtrise des disciplines « cœur du métier ferroviaire » nécessite des formations en interne sauf des exceptions d’externalisation.

Vue la concurrence accrue entre les différents modes de transport, le ferroviaire cible sur une bonne formation de son personnel pour accroître sa productivité et durable.

Dans l’exposé le cycle de formation des métiers de base sera passé en revue en mettant l’accent sur les systèmes d’évaluation qui débouchent pour certains sur des autorisations d’exercer des fonctions spécifiques surtout ceux liés à la sécurité.

On notera la distinction nécessaire entre l’évaluation à chaud et en situation des apprentis tout en soulignant leur complémentarité.

En général l’évaluation à chaud se présente sous les formes suivantes :

- Évaluation de la satisfaction des formés ;
- Des tests de connaissances.

Quant à l’évaluation en situation, elle se présente comme suit :

- Les résultats quantitatifs sur la perception de l’acceptabilité des contenus de formation des formés grâce à trois variables : le volume d’information, la complexité, le niveau d’attention et de concentration requis ;
- Les résultats qualitatifs sur les capacités à gérer des risques en situation de travail développées par les formés grâce à la formation ;
- Le résultat du transfert par questionnaire lors d’entretien annuel avec le responsable hiérarchique.

Etant donné, que seul le comportement en situation réelle du formé qui compte, l’approche objet de la présentation consiste à formuler la performance finale du collaborateur en tenant compte des critères pertinents relatifs à tout son cycle de formation.

La formule se résume en :

\[
P_f = (C_r \times C_f \times C_h \times C_s) \times F_b
\]

- \( P_f \) = performance finale
- \( F_b \) = Formation de base
- \( C_r \) = Coefficient lié aux requis avant la formation
- \( C_f \) = Coefficient lié à l’évaluation à chaud
- \( C_h \) = Coefficient lié au suivi par la hiérarchie
- \( C_s \) = Coefficient lié à l’évaluation en situation
Les coefficients ci-dessus correspondent aux valeurs suivantes :

- 0,5 : évaluation non performante ;
- 0,75 : évaluation performante ;
- 1,0 : évaluation très performante.

En conclusion cette approche permet d’une part de prédire la performance globale d’un collaborateur et d’autre part elle permet d’expliquer sa non performance en situation en analysant l’historique de sa formation.

Cette approche est itérative chaque fois que le collaborateur est appelé à suivre une formation donnée et permet de constituer une banque de données à exploiter le long de sa carrière.

**WCRT Topics addressed in paper, First Topic**

Training evaluation and return on investment

**Optional Second Topic**

*Sans réponse*
47.
48.

About the author

Name
Elio Minerva

Position
HR Manager

Company
RFI-Rete Ferroviaria Italiana (Infrastructure Manager of FSI- Ferrovie dello Stato Italiane)

Email
e.minerva@rfi.it

Telephone
+39 333 2942415

Abstract

Title
From “Classroom to experiential Training, through digitalization”. The case of RFI-Rete Ferroviaria Italiana

List the key lessons or learning point that delegates will take away from the conference

There will be presented the main issues of Project, started on Jan 2019:

the concept of the research (based on the notion of “division of labour”, yesterday between humans, tomorrow between humans and AI/algorithms)

the methodology (based on in-depth interviews with Line Managers and comparison of data and trends with templates)

the update of the results (interviews) at the date.

Abstract in English (no more than 500 words)
New digital Technologies will probably effect also the Railway Industry with a strong impact on jobs and training. In order to explore the future working scenarios, UIC sponsored a research on "The future Work & Training". The Team Partners are: Ferrovie dello Stato Italiane (Project Coordinator), Deutschebahn, SNCF, MIIT/RZD Russian Railways, Rail Center Netherland, OEBB Austria, Svolenian Railways, RTI-UK, Amey-UK.

The main scope of the research is to describe future railway work scenarios, make forecast of impact on jobs and match the best L&D Learning Technologies to train the necessary future workforce.

The focus in the first phase is in describing the possible future implementation of new Technologies in the following railways processes: Infrastructure Maintenance, Traffic Control, Driving, Train Assistance.

**WCRT Topics addressed in paper, First Topic**

Research & development for innovation in the area of training

Optional Second Topic

International co-operation between companies
49.

About the author

Name
Andrew J. Russell

Position
Managing Director

Company
Rail Training International Ltd

Email
andrewrussell@rti.co.uk

Telephone
07906905487

Abstract

Title
A Model for the Development of Railway Trainers in Integrating Non-Technical Skills into training and assessment: A National and International case study of Trainer Skills Development

List the key lessons or learning point that delegates will take away from the conference

Able to distinguish between a technical and a Non-Technical Skill
Outline the role of NTS in accident and incidents
Describe the importance of addressing NTS within Competence Management Systems
Explain the contribution of task analysis to the development of behavioural markers
Explain the importance of developing NTS behavioural markers for meaningful training and assessment
List the classical three stages of NTS development
Consider the implications of findings from two NTS Train-the-Trainer projects on the development of NTS within their own organisations and culture

Abstract (no more than 500 words)
Non-Technical Skills (NTS) are the thinking skills that underpin and enhance technical tasks. They improve safety by helping people to anticipate, identify and mitigate against errors. Research has consistently shown NTS failure to be a major contributory failure in accidents and incidents.

In the railway industry, much of the application of NTS has been in the train driving community, although NTS are now beginning to cascade into other disciplines, such as engineering maintenance, control room operation and platform dispatch. In addition, links are beginning to be made between NTS and other risk reduction concepts, such as Dynamic Risk Assessment.

The railway training community must be considered as a key enabler to the successful introduction of NTS. For the training professional, the emphasis must be placed on developing the thinking skills and behaviours required to reduce the risk of error, in the staff they train and assess. The challenge is to develop the competence of the community in applying NTS in training and assessment and also to achieve buy-in to the concepts.

This paper provides a description of how the recognised three-phased method for developing NTS has been applied to develop operational trainers in two companies, one in the UK and one in The Netherlands. The approach used emphasises the importance of developing standardised and customised behavioural markers as a means for providing clear and consistent skills development and assessment.

The concept of NTS was introduced into in three sessions for each company to a target audience of operational managers, operational trainers and educational experts. The aim was to get trainers in both companies to a level where they would be able to independently develop NTS training materials including simulator scenario’s supported by behavioural markers. The groups had no prior theoretical experience with NTS concepts. In between sessions, group members experimented with ideas for NTS training materials. Following the sessions, NTS training material was developed and piloted. The module content emphasised ‘situational awareness’. The groups also developed simulated scenarios where NTS concepts could be experienced.

The success of this work provides a simplistic model for railway trainer and training material development in NTS internationally and across multiple railway disciplines.

**WCRT Topics addressed in paper, First Topic**

Human factors and training

**Optional Second Topic**

Safety risk culture (personnel & customer safety/railway safety)
51.

About the author

Name
Gonçalo Bruno Venceslau Bernardino

Position
Training Manager

Company
Infraestruturas de Portugal

Email
goncalo.bernardino@infraestruturasdeportugal.pt

Telephone
+351918912518

Abstract

Title
Training evaluation: Confronting trainers and trainees causal conditions for success and failure

List the key lessons or learning point that delegates will take away from the conference
Detect the training programs characteristics associated to the highest evaluations, as well as the contours of training programs that don’t present good evaluations.

Abstract in English (no more than 500 words)

Training effectiveness evaluation regards the degree to which training objectives are met (Noe, 2010; Wankhede & Gujarathi, 2014). Training evaluation involves assessing performance that results from the training programs. Training effectiveness evaluation is challenging because training effectiveness results from several contributions, like managers decisions, trainees perseverance, the organizations characteristics and environmental factors, and all these influences originate huge complexity (Endres & Kleiner, 1990).

This study uses annual data from the Portuguese railways company. The institutional model of railways in Portugal follows complete separation between the infrastructure and the train operations (Finger, 2014). The study uses data from the training programs, (external
programs; internal programs), 430 trainers and 6000 trainees of the Portuguese railway infrastructure manager over one year regarding investments in training over 340,000 euros. The company is a certified training organization that possesses the adequate internal structure – an autonomous department - to provide training activities, and develop the associated evaluation mechanisms. The company focuses on business training regarding cost savings and providing railway technical training. Regarding business support training, the company focuses on leadership and management training, such as project management, advanced programs of management and leadership, quality and personal development.

This study uses a qualitative analysis to address the pathways to highest trainers’ and trainees’ evaluations (success) and the circumstances leading to less successful results in both cases. Using a Qualitative Comparative Analysis (QCA) enables to detect the training programs characteristics associated to the highest evaluations, as well as the contours of training programs that don’t present good evaluations.

**WCRT Topics addressed in paper, First Topic**

Training evaluation and return on investment

**Optional Second Topic**

*Sans réponse*
52.

About the author

Name
Session organizer
Maria Lebbar, École Nationale Supérieure des Mines de Rabat, Maroc, lebbar@enim.ac.ma

Topic
Training management cycle

Co-Authors
Abdelhakim Artiba, Président Université Polytechnique Hauts-de-France, abdelhakim.artiba@uphf.fr

Mourad Abed, Coordinateur Projet SIGMA RAIL, mourad.abed@uphf.fr

Mustapha Ouadghiri, Directeur École Nationale Supérieure des Mines de Rabat, Maroc, ouadghiri@enim.ac.ma

Moulay Larbi Abidi, Directeur École Mohammadia d’Ingénieurs, Maroc, abidi@emi.ac.ma

Hatem Zenzri, Directeur École Nationale d’Ingénieurs de Tunis, Tunisie
hatem.zenzri@enit.utm.tn

Sami Faiz, Directeur Institut Supérieur des Arts Multimédia de la Manouba, Tunisie,
sami.faiz@insat.rnu.tn

Ricardo Gonçalves, Universidade NOVA de Lisboa (UNL), CTS, DEE/FCT, Portugal,
rg@uninova.pt

Stefano Bruni, Politecnico di Milano, Dipartimento di Meccanica, Italy,
stefano.bruni@polimi.it

Manderscheid Françoise, École des Ponts ParisTech, France,
francoise.manderscheid@enpc.fr

Position
Professors

Company
UPHF ; ENPC ; Polimi ; UNL ; ENSMR ; EMI ; ENIT ; ISAMM

Email
lebbar@enim.ac.ma ; mourad.abed@uphf.fr

Telephone
00212 667 211362
Abstract

Title

SIGMA RAIL, A EURO-MEDITERRANEAN PROJECT ON RAILWAY INFRASTRUCTURE MAINTENANCE TRAINING

List the key lessons or learning point that delegates will take away from the conference

The SIGMA_RAIL Euro-Mediterranean project is co-funded by the ERASMUS+ Program of the European Union. The most important results and lessons that will be highlighted in the conference are:

- Modernization of higher education systems
- The e-learning courses in railway infrastructure maintenance designed
- A demonstration of the Serious game
- Collaboration between the university and the railway operators as a good way to meet the needs of training and specially the operator’s expectations

Abstract (no more than 500 words)

The SIGMA_RAIL Euro-Mediterranean project is co-funded by the ERASMUS+ Program of the European Union (Key Action 2 - Capacity-building in the Field of Higher Education). Such a structural project aims to promote reforms in higher education systems and strengthen relations between higher education systems and the wider economic and social environment. SIGMA_RAIL’s goal is to propose e-learning training on railway infrastructure maintenance dedicated, not only to engineering and master programs of initial training, but also to continuing vocational education.

The Consortium is composed of academies from Europe and the Maghreb, with complementary competences regarding the project’s goal.

From Europe: Université Polytechnique Hauts-de-France (UPHF, ex-UVHC), École des Ponts ParisTech, Politecnico di Milano, and the Universidade NOVA de Lisboa.

From the Maghreb: The Tunisia’s Ministry of higher education and scientific research, Université de Tunis El Manar, and Université de la Manouba; the Morocco’s Ministry of national education, vocational training, higher education, and scientific research, École Nationale Supérieure des Mines de Rabat, and Université Mohammed V de Rabat.

Three other institutions are associated members of SIGMA_RAIL: the Morocco’s Institut de Formation Ferroviaire (IFF) and Office National des Chemins de Fer (ONCF), and the French IRT Railenium.

The SIGMA_RAIL’s goal tackles challenges expressed in (i) the National priorities for railway transport in Morocco and Tunisia, and (ii) the Regional Transport Action Plan for the Mediterranean Region (RATP 2014-2020). One priority of those challenges is the development of knowledge, competence, and training which will meet the needs regarding, for example, railway productivity for both passengers and freight in the Maghreb.
Determining the SIGMA_RAIL training contents had required an accurate identification of training needs, which had been carried out through different activities: academic and industrial visits; debates with rail experts; mappings of engineering and master courses which are or could be related to railway sector; construction of a core competency reference guide and of a skills matrix.

Academic and industrial visits had been organized in the partner countries, enabling the project’s members to discover academic good practices, research and technological platforms, and rail maintenance operations, as well as to meet academic leaders and political and socio-economic stakeholders in the field of transport, particularly in railway sector (the Tunisia’s SNCFT railway operator and RFR Rapid Railway Network Company of Tunis; the RFI Italian Railway Network; etc.).

These visits had provided opportunities to discuss around training supply and expert human resources needs in terms of railway-related skills. The project’s goal to propose e-learning courses in rail engineering had met the expectations of Tunisian and Moroccan stakeholders of the railway sector. It was an excellent opportunity of collaboration between the university and the railway operators.

In fine, the training needs analysis has led to the definition of 17 online courses and a serious game built around railway infrastructure maintenance. Those results will be showed at the 5th UIC World Congress on Rail Training through demonstration and posters.

Acknowledgements
The SIGMA_RAIL project is co-funded by the Erasmus+ Program of the EU (No. 561986-EPP-2015-FR-EPPKA2-CBHE-SP). All the members of the SIGMA_RAIL Consortium are warmly thanked, as well as the UPHF’s DSI & DRV.

**WCRT Topics addressed in paper, First Topic**

National cooperation between the industry & education sectors at all levels

**Optional Second Topic**

Training design
53.

About the author

Name
Sergey Saratov

Position
Head of Human Resources Department

Company
JSC "Russian Railways"

Email
sergeevaee@css-rzd.ru

Abstract

Title
Development of management personnel reserve as part of the system of continuous training of personnel in JSC “Russian Railways”

List the key lessons or learning point that delegates will take away from the conference

- structure of personnel reserve in JSC “Russian Railways”;
- personnel/managerial personnel trainings and development programs;
- managerial personnel selection criteria;
- the Corporate university of JSC “Russian Railways”, best practices and innovation approaches to employee’s competences development;
- personal effectiveness in today’s VUCA world.

Abstract (no more than 500 words)

The development and training system for railway sector employees in Russia is defined by a complex approach and a continuous process of developing professional, corporate and management competences. This work is being done both at the initial stage of becoming a future railway employee (specialized preschools and schools, colleges and universities), and throughout all stages of the employee career in JSC “Russian Railways”.
With the total number of Russian Railways employees coming close to 760,000, the following work is carried out:

◊ more than 150,000 employees attend regular training and skills upgrade courses at railway training centres;
◊ more than 70,000 engineers and specialists upgrade their skills at railway universities;
◊ more than 60,000 managers (from lower-level to top-management) are involved in corporate and open programs of professional and management competence development in specialized universities, business schools, professional institutions and academies.

There are three levels of managerial personnel reserve built in JSC “Russian Railways” and renewed on an annual basis: basic reserve – candidates for lower-line managers (stations, depots, etc.); corporate reserve – candidates for regional directorates and affiliate branches managers; strategic reserve – candidates for the position of central departments of the company.

A special role in developing managers who are part of the personnel reserve is played by the Corporate university of JSC “Russian Railways”. The Corporate university of JSC “Russian Railways” is responsible for assessing the leadership competences of the employees who are part of this reserve, for creating programs and holding trainings for continuous development as they move on their career paths and shift to higher levels of the personnel reserve.

Managerial pool development system is implemented in four stages in the Corporate university of JSC “Russian Railways” and is essentially an inhouse business education system. At the first stage for every reserve level obligatory programs are arranged to build a uniform management culture, to master common managerial terminology, to develop the management personal effectiveness in staff management and interpersonal communication; to form the basis for strategic and value thinking in terms of decision making.

At the second stage managers are deepening their knowledge in questions dealing with mastering applied managerial instruments for business administration. Attention is also paid to the instruments of corporate management, project management, marketing, financial management, expense management, innovation management, etc. Special emphasis here is made on developing skills of effective crossfunctional interaction in the matrix management system.

The third stage is characterized by creating educational environment where managers learn to analyze global, national and sectoral trends, build scenarios for strategic development and calculate forecast indicators. Special attention at this stage is paid to managerial evaluation of perspective implementation of the digital economy technologies in the work process of the company, comprehension of the breakthrough innovative ideas and business platforms. In terms of developing personal effectiveness the stress is made on decision making skills in today’s VUCA world.

Finally, main aims of the fourth stage are structuring the knowledge obtained at the previous
stages, consolidating the work experience in managerial positions, broadening managerial horizons by exploring best practices from other sectors and types of business, and international experience.

Having completed all the four business education steps in the Corporate university of JSC “Russian Railways” managers acquire knowledge and develop skills equal to those provided by the leading EMBA business schools programs.

Abstract in English (no more than 500 words)

The development and training system for railway sector employees in Russia is defined by a complex approach and a continuous process of developing professional, corporate and management competences. This work is being done both at the initial stage of becoming a future railway employee (specialized preschools and schools, colleges and universities), and throughout all stages of the employee career in JSC “Russian Railways”.

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At the second stage managers are deepening their knowledge in questions dealing with
mastering applied managerial instruments for business administration. Attention is also paid to the instruments of corporate management, project management, marketing, financial management, expense management, innovation management, etc. Special emphasis here is made on developing skills of effective crossfunctional interaction in the matrix management system.

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Having completed all the four business education steps in the Corporate university of JSC “Russian Railways” managers acquire knowledge and develop skills equal to those provided by the leading EMBA business schools programs.

**WCRT Topics addressed in paper, First Topic**

National organisation of training. How standards are applied

**Optional Second Topic**

Management and leadership development
54.

About the author

Name
De Keersmaeker Lucien

Position
Manager Infrabel Academy

Company
Infrabel

Email
lucien.dekeersmaeker@infrabel.be

Telephone
+32-25-254455

Abstract

Title
Safety First... & all the time !Comment stimuler un comportement sécuritaire durable via un programme de formation sur mesure lié à la sécurité ?

List the key lessons or learning point that delegates will take away from the conference

1) Why it is worth for any railway company to invest in a Safety Learning Program.
2) Why not take for granted that safe behaviour is inherent to human nature, but how it can and should be encouraged continually.
3) How part of that stimulation of safety behaviour can be done through a Safety Learning Program and why it is an asset to :
   • have it tailor-made in function of the employee’s profile ;
   • let it run through the employee’ whole career (lifelong learning) ;
   • integrate various learning methods.
4) Why supervisors/team leaders/managers are key players in establishing a long-term safety culture.

Abstract (no more than 500 words)
Safety First ! est la première priorité d’Infrabel, tout comme dans la plupart des sociétés du secteur. Avoir un comportement sécuritaire n’est pas inhérent à la nature humaine. Le fait d’ancre une culture sécurité solide dans l’esprit de nos travailleurs et maintenir une prise de conscience des risques sont deux objectifs principaux qu’Infrabel Academy prend en compte dans le développement de son programme de formation lié à la sécurité. Ce programme transversal suit en outre parfaitement les principes de la culture d’entreprise basée sur les notions de confiance, collaboration, responsabilité, co-construction.

Pourquoi ce programme ?
Ce programme rassemble toutes les initiatives existantes en termes de formations liées à la sécurité d’exploitation et du travail et intègre également de nouvelles thématiques, en instaurant une cohérence globale pour le collaborateur. En parcourant ce programme en fonction de son rôle à jouer dans la société, le collaborateur prend conscience de l’importance d’un comportement sûr face aux risques ferroviaires, pour lui et pour ses collègues. En occupant une position centrale dans son apprentissage, il se responsabilise par rapport à ses compétences à acquérir et ses certifications.

En quoi consiste-t-il ?
Proposé dès le recrutement et tout au long de la carrière, le programme intègre différents méthodes de formation : des formations en classe, un suivi on the job et des modules online.

Les formations en classe proposées sont interactives, didactiques et ont comme trame de fond les principes du Brain Based Safety. Celles-ci seront dispensées dans les espaces du tout nouveau centre de formation d’Infrabel qui permet de mettre l’accent sur la démonstration et la pratique.

Le suivi on the job, sous la forme d’un portfolio, permet par la suite d’aider aussi bien le collaborateur que son responsable à connecter la théorie à sa propre réalité de terrain. Un serious game, qui suit l’évolution de l’agent au fil de ses certifications et responsabilités, permet de façon libre de s’exercer dans un environnement totalement sécurisé.

Ce programme se veut moderne et innovant pour répondre aux tendances d’apprentissage de la nouvelle génération qui s’habitue à apprendre vite, de façon improvisée et instantanée. Des modules de réactivation/d’ancrage sont disponibles à partir de n’importe quel outil informatique, à consulter à tout moment et n’importe où : l’importance de répéter sans cesse les bons comportements est ici mise en avant.

A qui est-il destiné ?
Le programme est destiné à trois types de public.
Premièrement, les nouveaux collaborateurs et ce peu importe leur fonction (collaborateurs administratifs ou opérationnels) suivent un module donné dans le cadre de leur trajet d’intégration. Ces formations, données par des professionnels de la sécurité, permet dès le début de la carrière de mettre l’accent sur l’importance de la sécurité pour Infrabel.
Deuxièmement, les collaborateurs directement concernés par le travail sur les voies participent à des modules plutôt axés sur les mesures de protection. Ces modules peuvent être soit des modules de formation généraux, soit des modules certificatifs liés à des fonctions de sécurité.

Troisièmement, les responsables d’équipe, quel que soit leur niveau hiérarchique, sont conscientisés à l’importance de l’exemplarité et à leur responsabilité morale et légale en terme de sécurité et de bien-être au travail.

Rentrez chez soi sains et saufs !

En offrant l’opportunité à tous les collaborateurs d’être formé de façon continue, au bon moment tout au long de sa carrière, Infrabel rappelle à chacun l’importance de travailler en toute sécurité et de pouvoir rentrer chez soi sain et sauf. N’est-ce pas la responsabilité mutuelle que nous entendons sous « Safety First » ? Ni plus, ni moins.

Abstract in English (no more than 500 words)

‘Safety First’ is Infrabel’s key priority, as in many companies of our sector. Safe behaviour though isn’t inherent to human nature. So establishing a strong safety culture in the minds of our employees and maintaining risk awareness were two main objectives Infrabel Academy had in mind when developing its safety learning program. This transversal program also had to fit in perfectly with Infrabel’s corporate values which are based on concepts such as trust, collaboration, responsibility and co-creation.

Why this program ?
The learning program comprises the ongoing initiatives in terms of operational and occupational safety training and at the same time integrates some new topics. As a result it creates an overall coherence.

By following the program, according to their roles in the company, employees become more aware of the importance of safe behaviour when facing task-related risks, not only for themselves but also for their colleagues.

In the program all employees are considered as key actors and are granted a large amount of responsibility to acquire the necessary skills and certifications.

What does the program consist of ?
The safety learning program is initiated as soon as the employee is recruited and it runs throughout his career. It combines a variety of training methods : classroom training, on-the-job sessions and online modules.

The classroom-based training is interactive, informative and based on the principles of Brain Based Safety. The courses are delivered at Infrabel’s brand new Learning and Development Centre where the premises are specifically designed for practical lessons and demonstrations.

The on-the-job follow-up part, in the form of a portfolio, helps both the employee and his supervisor in applying the safety theory to the daily reality of the job. A serious game, which
monitors the employee’s development through the certifications and responsibilities, enables them to put the training contents into practice in a completely safe environment. The program can thus be described as modern or innovative, but is also aligned to the learning styles of a new generation of employees who are used to learning fast, on an instant basis. Refresher modules are available on any device so they can be consulted at any time and in any place. At all times the content focuses on the importance of reiterating the right behaviour.

Who is it intended for?
The program is tailor-made based on three employee profiles:
Primarily, all new employees take part in a specific safety course as part of their induction process, regardless of their tasks (administrative or operational). By offering these training courses, delivered by safety professionals, Infrabel highlights the importance of safety right from the very start of one’s career.
Secondly, employees directly involved in working on the tracks follow courses that focus more on the protective measures. These courses are modular and can take the form of a general training or certification modules which are related to safety features.
Thirdly, all team leaders, regardless of their managerial level, are made aware of the importance of setting a good example and their responsibilities in terms of safety and well-being at work, not only in a legal but also in a moral sense.

Get home safe!
By offering all employees the opportunity to follow this continuous safety learning program, at the right time and throughout their careers, Infrabel reminds them why it really matters to work safely: to get themselves and their colleagues home safe. Isn’t this mutual responsibility what we really mean when we say “Safety First”? No more, no less.

WCRT Topics addressed in paper, First Topic
Safety risk culture (personnel & customer safety/railway safety)

Optional Second Topic

Sans réponse
55.

About the author

Name
PAPILLAUHT

Position
Senior advisor Human Factors

Company
international union of railways

Email
papillault@uic.org

Telephone
0144492275

Abstract

Title
Training, Awareness, Communication Toolbox : a security toolbox for railway members

List the key lessons or learning point that delegates will take away from the conference

- new tools at the disposal of railway members
- best practices and experiences improving security
- lots of information on training, awareness and communication used in railway security area

Abstract in English (no more than 500 words)

Due to the importance of the Organizational and Human Factors within the security policies, the development of relevant training actions is crucial for professional staff. In addition, regular campaigns for raising clients and general staff awareness are needed in complement of the professional training. Within this framework, the TACT, Training, Awareness and Communication Toolbox, has been designed during the 2016 Additional programme with the UIC members of the security platform.

What for?
• Supporting the UIC members in facilitating exchange of experience on existing training principles, awareness campaigns and communication tools.
• Helping the UIC members in gathering all the best training principles, awareness campaigns and communication tools in a single and easy-to-use toolbox

How?
• Creation of a toolbox gathering the training organisations and training principles for security staff, and beyond for non-security staff. The toolbox has been created and updated accordingly to the prioritary themes defined in common during the 2nd UIC security week. The aim of the toolbox is to help each member to build its own training program, perhaps to organize common training events taking advantage of the various experiences. Some parts are confidential and reserved to identified people in charge of the problem within their company.
• In the longer term, the toolbox will enable the identification of topics, issues, events, interests that could become common actions regarding training and communication for improving security of each member

With whom?
• With the support of UIC security team
  ➤ updating of the toolbox,
  ➤ gathering of information from all the members (international level),
  ➤ proposal of topics, events that are common to the members.
• With the support of the UIC members
  ➤ Providing inputs on training, awareness and communication for security staff, non-security staff and public (leaflets, guidelines, principles, campaigns, module, video, application, e-learning, software, ....)

For whom?
Training principles and modules are addressed to security staff (professional) and managers. Awareness campaign and communication tools are rather addressed to non-security staff and public/clients.

**WCRT Topics addressed in paper, First Topic**

International co-operation between companies

**Optional Second Topic**

Human factors and training
56.
57.

About the author
Name
Rajkiran Kandola
Position
HSEQ Research
Company
Amey
Email
rajkiran.kandola@amey.co.uk
Telephone
079771221415

Abstract
Title
Developing a strategic level psychological safety measurement toolkit and training for UK consulting and rail employees: A case study

List the key lessons or learning point that delegates will take away from the conference
1. The accident plateau and our approach to understanding how human behaviour, attitudes and opinions can drive us closer to zero harm across the industry
2. Our approach, as a case study in developing other non-traditional methods of safety measurements that extend beyond close call reporting
3. The importance of considering safety attitudes to reduce risk and the complexities in collecting this data accurately
4. Various measures to consider when exploring psychological/human factor variables (i.e. where do we start?)
5. The potential outcomes/outputs of psychological and human factor data in survey format
6. Approaches to transfer knowledge and training to staff to ensure competency and our training framework

Abstract (no more than 500 words)
The HSE report in 2016/17 609,000 injuries occurred at work with an estimated cost of £14.9 billion in 2015/16. Despite a downward trend in accident and injury rates in the workplace, the UK Health and Safety Executive (HSE) report that overall accident frequency has reached an ‘accident plateau’ above zero (HSE, 2016). Following an accident or incident, follow up reports often conclude the root cause ‘was the result of human error’, however this is rather simplistic and requires a more deeper understanding and knowledge to prevent reoccurrence.

In order to address this issue Amey, an organisation in consulting and infrastructure support services has attempted to implement a strategic level intervention as the first step to understand psychological/human factor variables that could be associated with accident risk in the civil engineering industry. A combination of academic knowledge and industry leading research has supported in the development of a series of psychological/human factors scales to make up a detailed questionnaire as part of an in house safety ‘toolkit’.

The toolkit, which was developed as part of a Knowledge Transfer Partnership with Leeds Beckett University is made up of various scales that are related to well-being e.g. stress indicator and organisational priorities e.g. safety climate. Data derived from the toolkit can be used to gather a detailed understanding of safety beyond traditional in-house safety indicators, such as close call reporting. Success and optimal usage of the toolkit requires large-scale data collection in order to conduct relevant detailed analysis on each factor, therefore a bottom-up approach was adopted in the development including pilot testing of the safety ‘toolkit’. In addition, transfer of training on human behaviours is of paramount concern for Amey and there is a growing concern over the ‘transfer problem’. The present paper provides a critique of the existing transfer research in training design, trainee and the work environment and suggests directions for future research investigations.

The outputs of the safety ‘toolkit’ will produce detailed analysis by factor and a deeper understanding and insight into psychological and human factor variables, which might influence risk. This paper describes our approach to implement and improve usability of a long-term strategic level intervention and the development of safety ‘toolkit’ and the application of its accompanying framework. The research gaps identified from the training transfer include the need to a) test various operationalization of training design and work environments and b) develop a framework for conducting further research on the effects of learner characteristics on transfer.

Abstract in English (no more than 500 words)

The HSE report in 2016/17 609,000 injuries occurred at work with an estimated cost of £14.9 billion in 2015/16. Despite a downward trend in accident and injury rates in the workplace, the UK Health and Safety Executive (HSE) report that overall accident frequency has reached an ‘accident plateau’ above zero (HSE, 2016). Following an accident or incident, follow up
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WCRT Topics addressed in paper, First Topic
Human factors and training

Optional Second Topic
Transfer of learning to the workplace
About the author

Name
TACHNOUT MOUNIR

Position
Responsable Ingénierie de Formation

Company
Office National des Chemins de Fer (ONCF)

Email
tachnout.mounir@gmail.com

Telephone
0680903956

Abstract

Title
La Formation comme Dispositif d’intégration des Jeunes Recrues : États des Lieux et Perspectives Managériales / Cas du Programme PTS à l’ONCF

List the key lessons or learning point that delegates will take away from the conference

L’expérience de l’ONCF en matière d’intégration des nouvelles recrues ;
Un benchmark des « best practices » en la matière ;
Un exposé sur le cas de la formation « Passport to Success : PTS » et son impact sur l’intégration des nouvelles recrues à l’ONCF ;
Les perspectives et propositions en matière de pratiques d’intégration des nouvelles recrues.

Abstract (no more than 500 words)

La Formation comme Dispositif d’intégration des Jeunes Recrues : États des Lieux et Perspectives Managériales / Cas du Programme PTS à l’ONCF
Mounir TACHNOUT

Résumé :
Le contexte ferroviaire international est marqué par des départs massifs à la retraite. D’où la nécessité et l’urgence de préparer la relève et ce afin que les entreprises ne perdent pas leur

- Le domaine d’application du sujet :
Management Stratégique des Ressources Humains
- Les questions abordées :
  - Comment la formation peut favoriser l’intégration des nouvelles recrues ?
  - Quels sont les états des lieux et perspectives managériales en matière d’intégration des nouvelles recrues ?
• Le résultat proposé :
Découvrir les meilleures pratiques d’intégration en adéquation avec le monde ferroviaire.

Mots clés : formation, intégration, jeunes recrues, compétences comportementales.

Abstract in English (no more than 500 words)

Training as a device for integrating young recruits : state of play and managerial perspectives / Case of the PTS program at the ONCF:

The international railway context is marked by massive retirements. Hence the need and urgency to prepare the succession so that companies do not lose their expertise and to ensure their sustainability.

Faced with this issue of departures, integration is a crucial issue to make the investment in recruitment profitable. In addition, the successful integration of new recruits is a first step in a career management process. Stronger than that, successful integration is a prerequisite for intergenerational management that will guarantee knowledge management (KM) and therefore better succession planning.

So the strategic nature of the integration is well established. As a result, training can play a central role in this area.

As a starting point, we asked about the best possible process, best practices and tools that can improve the integration of new recruits into the rail networks. We focused on the role that training can play, focusing on the development of behavioral skills given their potential for organizational socialization. Our target population is young recruits, HR managers and business experts. On the methodological level, we will opt for triangulation, combining qualitative and quantitative approaches.

We chose the case study of a training program for new recruits, the fruit of a partnership between the National Railways Office (ONCF) and the International Youth Foundation (IYF). Our choice was motivated by the possibility of duplicating this program by the other rail networks. Also, our choice is explained by the fact that the said program provided for the training and certification of ONCF trainers and the appointment of an internal trainer coach who designed the teaching aids.

In this post, we will present ONCF’s experience in the integration of new recruits, a benchmark of "best practices" in this area. In a second step, we will present the case of the training "Passport to Success : PTS" and its impact on the integration of new recruits at the ONCF, to arrive at the perspectives and proposals for the integration practices of new recruits.

This post draws its interest from the importance of integration in view of the current context of railway companies (GAP Generational, departures and massive recruitment, specificities...
and diversity of railway trades). Indeed, in the face of new challenges, new approaches are needed.

• field of application of the subject:
  Strategic Management of Human Resources

• issues discussed:
  \ How can training help integrate new recruits?
  \ What are the state of play and managerial perspectives in terms of integrating new recruits?

• The proposed result:
  Discover the best practices of integration in adequacy with the railway world.

Key words: training, integration, young recruits, behavioral skills.

**WCRT Topics addressed in paper, First Topic**

Sustainability of knowledge management – transfer of railway knowledge to the new generation. Which role for training?

**Optional Second Topic**

Trainers (training, certification, development)
59.

About the author

Name
Simonetta Serafini

Position
Group Training & Learning Manager

Company
Ferrovie dello Stato Italiane

Email
s.serafini@fsitaliane.it

Telephone
0039 0644104576

Abstract

Title
Innovation Lab

List the key lessons or learning point that delegates will take away from the conference

Innovative training to develop cognitive skills regarding innovation, flexibility.
Innovative training to facilitate the cultural change to a proactive approach

Abstract (no more than 500 words)

The scope of the subject:
Gruppo Ferrovie dello Stato Italiane is currently operating in a framework characterised by the need of integration between a traditional mindset, strongly linked to our historical and cultural background, and the pursuit of innovation.
Our young people face the challenge to comply with our rules and procedures and to recognize the possibilities to rethink practices and behaviour.
In order to support people in this cultural evolution, the Group has developed a new Leadership Model.
This Model combine the need to continue to ensure the excellence of our services and standards and the importance of being open and ready to changes.
For this reason the organisational structure “Group Training & Learning” introduced “Innovation Lab” in the Training Offer.

Innovation Lab is a 6 days Learning Path based on the concept of “Cross-Connections”. Testimonials from Startups and Companies, meet the trainees in order to promote the growth and transfer of Know-How and managerial/behavioural skills.

The issues being addressed:
• How can we train our people to become innovation drivers? To what extent is necessary to acquire an innovation and barrier-breaking oriented new mindset?
• Will the Opening to the outer world, thanks to the meeting with successful realities different to FS Group, succeed in enlarging the vision of our people?
• How can we, through class and virtual learning activities, develop and train people to integration and collaboration (these two seen as opportunities to handle complexity throughout moments of comparison and sharing)?
• How can we rethink our business processes from an innovative point of view? Will it help to increase faster internal improving processes and external ones such as quality and customer satisfaction?

Objectives or proposed outcome
During the learning activities participants are divided into subgroups. Testimonials from Startups and Companies help them to adopt a divergent and innovative mindset. In the end the subgroups challenge themselves in conceive and present their new and innovative startup.

The Learning Path help to achieve the following goals:
• training and experimentation on following competences:
  o Innovation, flexibility and change management, with main aim of becoming confident in finding innovative solutions and at the same time handling discomfort situations.
  o Teamwork and collaboration, to learn how to collaborate in order to reach common targets, integrating and sharing competences.
  o Fast execution, to become quick decision-makers and achievers.
• Production of innovative solutions with high impact and improvement over business processes.

WCRT Topics addressed in paper, First Topic

New challenges, such as cross-cultural, inter-generational

Optional Second Topic: Research & development for innovation in the area of training
60.

About the author

Name
Grigore Havarneanu

Position
Research Advisor - Security Division

Company
International Union of Railways

Email
havarneanu@uic.org

Abstract

Title
Training initiatives to develop the skills for intervention and prevention in the area of CBRNe terrorism

List the key lessons or learning point that delegates will take away from the conference

- Particularities of a CBRNe-related crisis
- Five training elements for a CBRNe preparedness training targeted at railway staff (principle and examples)
- Recommendations for the future

Abstract in English (no more than 500 words)

Chemical, Biological, Radiological, Nuclear and Explosive (CBRNe) incidents, whether accidental or terrorist-based, can have a high impact on society. CBRNe risks or threats are very challenging because: they are hard to detect, the consequences of exposure are often unknown and there is the potential for delayed effects from contamination. As a result, CBRNe risks are typical of the so called ‘dread’ risks – defined by lack of perceived control, catastrophic potential, and fatal consequences.

The use of CBRNe agents on public transport premises already occurred and is a growing
threat today. For example, in 1995, the Tokyo subway system was subject to a coordinated series of five Sarin nerve agent attacks on three lines. Sarin vapour spread through the trains and stations overcoming passengers and staff, and created massive confusion at the start of the attacks as to what was happening and the cause of the injuries. In London, since the beginning of 2017, 49 crimes have been recorded where corrosive fluid was thrown with the intention of causing “grievous bodily harm” or to “cause an explosion”. Other European countries have been threatened by biological ricin-based weapons in 2018: two plots of terrorist attacks using ricin were stopped earlier this year in France and Germany thanks to law enforcement and intelligence services. As this threat continues to develop, there is the need for an improved European Union Action plan on CBRNe preparedness.

Railway premises and rolling stock are potential targets for CBRNe agents which can be easily spread because of the closed spaces, ventilation systems and the large number of people present at stations and onboard trains. In this context there is a growing interest of railway operators and infrastructure managers to prepare against these types of scenarios. Referring to this topic, the members of the UIC Security Platform have already started to reflect on the possible solutions. One central question is how national authorities and railway stakeholders can improve CBRNe threat detection and effective response to a CBRNe attacks. Besides the use of adapted sensors for detection, the answer is closely linked to good levels of staff training, public awareness and cooperation with the highly trained CBRN first responders (e.g. fire fighters, civil protection, ambulance or even the military).

This contribution highlights a set of training needs for the railway staff to develop their skills for prevention and intervention in the area of CBRNe: understanding the specificities of this threat, public perception of the threat, trust in authorities and responders, response measures and protective health behaviours, and risk communication.

These five elements represent the backbone of a CBRNe training initiative aiming to help railway staff become a key element in the security chain during such major crises. Such a training would have an important outcome for transport practitioners such as railway companies. It will help update their crisis management plans with practical recommendations concerning a threat which is less conventional, but which can have an extremely high impact.

**WCRT Topics addressed in paper, First Topic**

Security skills for intervention & prevention (suicide, terrorism, anti-social behaviour)

**Optional Second Topic**

Research & development for innovation in the area of training
Abstract

Title

Electrical risk Management

List the key lessons or learning point that delegates will take away from the conference

Innovative methodologies to develop both technical and behavioural topics.
Increase motivation and commitment of the users towards the topics/contents.

Abstract (no more than 500 words)

In order to reset our organizational and cultural mindset our company has introduced a relevant technological change in line with the current Digital Transformation. Thanks to the introduction of new learning methods we changed from a traditional, content-based frontal training to a digital and strongly interactive one. This change increased motivation and commitment of the users towards the topics/contents. The experimentation has been made on a strongly technical course (NORMA CEI 11-27) for managing the electrical risk linked to Railway Operations. NORMA CEI 11-27 describes the characteristics of the Professional Profiles whose task is planning, managing and organizing electrical activities with different responsibilities. This program comes from the need to update the technical and behavioural competencies
already acquired by blue collars whose task is to operate maintenance totally avoiding any possible workplace injury.
The aim of this program is to train more efficiently 950 people across 33 units all around Italy.
The Digital Training Course is developed as a tool capable of:
- Enlarge learning and commitment rates.
- Enhance communications methodologies, to boost the appeal on contents throughout a more interactive approach;
- Guarantee to users a bigger flexibility in matching their schedule with the training one
- To speed up and uniform the training contents for the users
- Providing Real time Learning Updates and monitoring
- Managing both technical and behavioural topics using only one learning path
In order to guarantee smart-accessibility we have arranged “Training Points” with smart-tools to maximize users experience.
The course duration is about 90 minutes, to allow the agile fruition of the Learning Path, structured into the following steps:
- Animated Teaser to promote the training course
- Storytelling and fiction with real actors representing real work-life cases to strengthen behavioural competencies.
- Intermediate check-ins to weight the user learning level and fill eventual learning gaps throughout automatic development tips
- Micro-learning to spread technical-normative competencies
- Final Test to certify the competencies acquired

The Digital Technology allowed the development of both Learning processes and activities. It has granted a bigger Know-How diffusion, an enhancement of quality, efficient cost and time management so as to become a crucial tool able to guarantee the transmission, implementation and development of new competencies. Add to this, the new framework eased users to understand the importance of these topics, maximizing their learning.

**WCRT Topics addressed in paper, First Topic**

Digitalization of training & learning solutions (including social media): success stories

**Optional Second Topic**

Research & development for innovation in the area of training
About the author

Name
Anjum

Position
Associate Professor

Company
Central Queensland University

Email
anjum.naweed@cqu.edu.au

Telephone
+61 8 8378 4520

Abstract

Title
The Role of Different Enhanced Information Train Displays Designs in Skill-, Rule-, and Knowledge-based Performance

List the key lessons or learning point that delegates will take away from the conference
How different features in displays promote different sorts of relationships with driving goals.
Understanding the role of skill-, rule, and, knowledge-based behaviour in display interaction.
Implications on training, and how to train effectively using different types of displays.

Abstract (no more than 500 words)

Today, train drivers operate in both ultra-modern and highly traditional rail settings. Regardless of which kind of rail system they work in, they must contend with (and operate their train using) a “glass cockpit,” comprised of component displays across various stages of their training journey. These component displays (e.g. the European Train Control System) typically contain enhanced information with preview or predictive features in the driver-machine interface. The design of these component displays varies enormously in terms of usability and features, with a large literature revealing that such displays have attracted
criticism in terms of their design and way the features are presented; however, few studies have actually sought to explore the manner in which train drivers must interact with the display in terms of their relationships with goals, and implications on different types of performance. As humans are highly goal-oriented creatures who actively select their goals (as opposed to deterministic input-output devices), understanding how different component displays draw on different types of cognition will help us better understand training demands, particularly as we shift to “hybrid” systems where old and new technologies co-exist.

A work domain analysis (Vicente, 1999) was conducted on 13 enhanced information displays drawn from published and grey literature using the abstraction-decomposition method. Displays were redrawn into schematics to understand the composition of aids and features and then categorised into three broad classes. These comprised: (1) a total of eight “cab class” component displays, referring to those that are installed in trains and also encountered during training; (2) a total of two “training class” component displays, referring to those that are not installed in trains but are used encountered during training; and (3) a total of three “research class” displays, referring to those that are found in neither trains nor in training, but have been used to with train drivers to conduct train driver research. All 13 displays were analysed using Rasmussen’s Skills, Rules, and Knowledge model of human performance (Rasmussen, 1983) to determine which kind of interactions they require.

Preliminary findings show that the technical functions of the displays are coordinated against component displays in highly varied ways that engender different kinds of human performance. Importantly, these differences occur within the same display class, with each demanding a specific type of engagement and different kind of performance from the driver. Findings are discussed in terms the different types of cognition characterized by the displays, and corresponding implications for train driver training.


Abstract in English (no more than 500 words)

Sans réponse
**WCRT Topics addressed in paper, First Topic**

Human factors and training

**Optional Second Topic**

Research & development for innovation in the area of training
64.

About the author

Name
Nassiri

Position
Directeur Commercial Grande Vitesse

Company
Office National des chemins de Fer (Maroc)

Email
nassiri@oncf.ma

Telephone
212679844844

Abstract

Title
Préparation des ressources humaines pour l’exploitation de la ligne grande vitesse marocaine

List the key lessons or learning point that delegates will take away from the conference

L’importance de :
* L’anticipation des recrutements ;
* La définition des besoins en formation ;
* Formation / évaluation ;
* Encadrement / accompagnement sur le terrain

Abstract (no more than 500 words)

En parallèle avec le chantier de construction de la LGV, l’ONCF a lancé un autre grand chantier relatif à la préparation à l’exploitation.
Le système de la grande vitesse étant basé sur des technologies de pointe dont le déploiement, la maintenance et l’exploitation nécessitent des ressources humaines fortement compétentes, l’ONCF a lancé un vaste programme de recrutement et de formation touchant à tous les domaines ferroviaires.
Ainsi il a été procédé au recrutement de près de 600 collaborateurs destinés à tous les domaines ferroviaires : ingénierie, maintenance infrastructures, maintenance matériel roulant, gestion des circulations, conduite des trains, conduite des sous stations, commercial....
Ces collaborateurs ont d’abord subi des formations ferroviaires de base et exercé sur les lignes classiques avant de suivre des modules spécifiques de qualité concernant la grande vitesse.
Afin de garantir la qualité requise pour l’exploitation de la grande vitesse selon les standards internationaux, un institut de formation ferroviaire a été mis en place en partenariat avec la SNCF et qui opérationnel depuis 2015.
Cet institut qui assure des formations de qualité à des groupes mixtes franco-marocains forme annuellement près de 4000 collaborateurs avec 33000 jours de formation environ.
La formation à L’IFF n’est pas exclusivement dédiée à la grande vitesse mais profite aussi à la ligne classique ce qui a permis de créer l’effet d’entraînement pour hisser vers le haut les compétences des collaborateurs qui assurent son exploitation.

Abstract in English (no more than 500 words)

Sans réponse

WCRT Topics addressed in paper, First Topic

Talent Development: which strategy?

Optional Second Topic

Sans réponse
65.

About the author

Name
Ivona Snijders

Position
MD Officer

Company
ProRail

Email
ivona.snijders@prorail.nl

Telephone
0031 6 34 955648

Abstract

Title
Talent program Personal Leadership

List the key lessons or learning points that delegates will take away from the conference

hands on best practices
learn from each other
inspiration

Abstract (no more than 500 words)

Building strategic talent management in a turbulent field of forces
Connect - improve - make sustainable

Preface
ProRail is the only rail operator in the Netherlands and originally a specialist company with lots of technical expertise and lots of clever people.
It struck me that young technical professionals often make a switch to (non-public) engineering firms to further their carrier. ProRail offered content and managerial training but no platform or training that is suitable for personal development, or any other program within which these professionals can further develop on a personal level.
It was the right time for a suitable talent program. Together with an committed colleague I came up with a concept in 2017 and by the end of the year we held our first tryout. It worked out surprisingly well, we’re already launching our second edition and were invited by various Dutch companies to talk about our talent approach.

Goal
Further develop the potential and talent present in the advanced professionals.

Who is it for?
- The talented project managers (PMR)
- The talented employees who do not yet provide leadership but have a leading ambition (MD potentials)
- High-quality specialists (technology, finance, communication etc)

In order to be able to enroll, it is necessary for the professional to have some working experience (5 to 10 years).

The group size has a maximum of 15 professionals, proportionally distributed: 5 MD potentials, 5 PMR staff and 5 talented specialists. Furthermore, we look at a nice balance between departments and male female distribution. Interaction between specialists and managers and other ‘blood groups’ must be maximal in practice; interaction is stimulated in advance and we simulate the learning group to stay together for a long time afterwards.

Core
More important than knowledge and skills is mentality. We depend on these people to build a New ProRail. Attitude and behavior are crucial here! How is this stimulated? It’s about performance and development. It is about YOU and your role within ProRail. It revolves around visualizing and tackling issues, going off the beaten path, inspiring, surprising and disrupting, confronting others while sharpening yourself. There is no possibility to escape, it is not a cognitive course, no lecture, no standard format. The themes that come with the bid are:
- What drives me?
- What is important to me?
- What is my intention, what do I want?
- Is my natural behavior effective?

It is intensive. Participants go through multiple phases: preparation and assessment, an intensive three-day off side working on a real an relevant assignment.

Initiative and sponsorship
Each participant provides an initiative (improvement idea within the sector) and provides a sponsor (someone who later helps with the implementation of the initiative). This sponsor works at least at IAO level within ProRail.
The participants present their initiative (often together with their sponsor) to the selection committee (composed with a number of Executive Committee members, a senior manager and a high-quality specialist). The best 15 candidates and / or improvement initiatives enter the program.

The sponsors are not just a coach. They ensure that these talents get a real CHANCE introducing them in the right places and offering them a platform to work from.

The chosen 15 candidates will have 8 months to realize their initiatives in practice. In doing so, they have a sufficient chance of sparring about all sorts of impediments with the trainers, with other candidates (in so-called triads) and their sponsors. In this way they learn a lot about themselves and get a valuable network within our organization.

This is not a classroom course. In this way, 15 different projects run directly within the organization, as a kind of ‘movement’ that arises !

The economic and other developments require organizations to incorporate flexibility and resilience into human capital. So perhaps the most important thing in this concept ; we see these young talents as a wheel for change within ProRail. Every change process starts with planning and talking, but in the and has to become visible in organization behavior.

Reality and desirability (two sides of change), the personal pain and step-by-step intervention are adequately covered in the triads of the talent program.

Outcome
The program is aimed at personal growth and makes it visible by pre-setting. The outcome will be different for each participant. What is the common denominator ? Afterwards growth is visible or even better : tangible ! Participant themself think "I could never have missed this". Others in the immediate vicinity acknowledge ’something has changed regarding this person ...’ !

**WCRT Topics addressed in paper, First Topic**

Training design

**Optional Second Topic**

Training Needs Analysis