# The Optimization of a Learning and Training Portfolio at a Multi-national Lift Manufacturer

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**Abstract.** The seed campus organization, a learning provider with hubs and satellites in each region of the business, is the global, sole learning provider at the multinational Lift Manufacturer for business-specific and business-adopted training. However, due to different histories of each core hub (Asia Pacific, Europe/Africa and North America), the learning offerings differ from region to region. In addition, Education Technology is evolving at a dramatic pace, which requires an agile design approach for training programs and courses. This paper looks into the current state of that lift and escalator engineering training & learning curriculum.

It examines the fundamental pedagogic design principles as well as the latest lift engineering requirements and technology trends to develop relevant and up-to-date Adult Learning strategies. The paper concludes with recommendation to improve the seed campus curriculum catalogue to ensure that the current expectations from the internal user group and the business are met.

## 1 INTRODUCTION

Learning is essential to supporting and enhancing the capability of any business organization, and a skilled and well-educated workforce can be described as its backbone and key success factor. The efficient and effective set-up of corporate learning programs is essential, especially when it comes to maximizing the cost and productivity.

Considering the high expense of corporate learning programs, businesses need to find new ways to develop their workforce on one hand, while on the other hand optimizing the total spend on learning programs in general. The strategic curriculum optimization helps companies offer training in line with business strategy. That optimization approach requires a solid structural analysis of the following prerequisites:

- A unified Competency Model or Skills Matrix (as an underlying foundation) is available for each business function
- Learning Needs are analyzed based on business function strategy and therewith define the competencies
- Synergies between curricula of learning providers and business functions are identified to minimize the area of training operations and to optimize the Return on Investment (ROI)
- Training courses are conducted in the way that workforce competency levels, the overall productivity and individual variety of skills are maximized. Therein suitable forms of training, such as classroom training, eLearning or Webinars and e.g. Virtual Reality training approaches are used to ensure the best individual fit in regards to learning styles [8].

## 2 SEED CAMPUS OVERVIEW

The overarching curriculum of the Corporate Enterprise operates through seven global 'Functional Campuses': Leadership, Controlling/Accounting/Risk (CAR), Communication (COM), Human Resources (HR), Project Management (PM), Procurement and Supply Management (PSM), Sales

and Strategy, Markets & Development (SMD). The program comprises courses offered via four 'Regional Learning Centers' (RLC) [1]. There is a very broad range of training courses available within the program which covers leadership skills, a selection of functional skills as well as some general / other areas.

The functional skills are Business Area (BA) specific, which includes the Elevator and Escalator Technology (E&ET) area.

The core engineering training is delivered through the Global Engineering Training Program (GETpro). This program is primarily designed for the Research and Development (R&D) community, but it could possibly provide training across other technical staff areas. GETpro is an engineering core program of the seed campus curriculum. The seed campus organizational structure is shown in Figure 1 below.

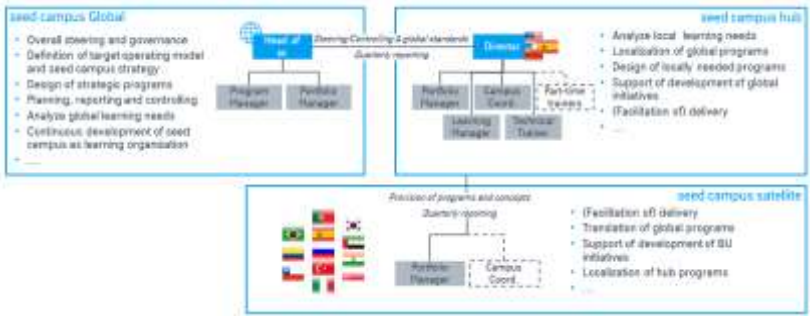


**Figure 1 Seed campus organizational structure**

## 3 COMPETENCY MODEL AND LEARNING NEEDS ANALYSIS

Learning Provider or Business Function curricula make a difference if they are designed to fill the gap between the workforce competencies and aligned to strategic business needs (Learning Needs Analysis).

### 3.1 Competency Model or Skills Matrix

A competency model determines tasks and function-specific competency levels (description of certain tasks a profile is required to perform). To be able to qualify employees to perform a specific task (e.g.: to manage a business process or apply a specific computer application), enterprises have to compare individual competency profiles with the required competencies (as shown in Figure 2).


**Figure 2 Spider Chart of Skills Matrix**

Such a competency model provides a method to consistently outline competency profiles. It helps to analyze organizational and position-specific needs, existing capabilities to derive learning objectives of individual training courses or modules.

### 3.2 Learning Needs Analysis

The purpose of a Learning Needs Analysis (LNA) is the systematic approach to determine training needs (→ What training needs to be offered?) and it considers the following aspects – in addition to the discussed business needs and competencies:

- Training Forms (What training methods fit best to the needs of the learner?). For example [8]:
  - On-site classroom training
  - eLearning
  - Videocasts
  - Massive Open Online Course (MOOC)
  - Physical simulator training
  - Augmented reality / Virtual reality / Mixed reality training
  - Micro Learning
  - Blended learning forms
- Cost (How much budget is available to develop and offer a specific measure to a group of learners?). Learning costs are typically broken down into the following cost categories:
  - Development cost (internal/external consultants, material, Intellectual Property, travel)
  - Travel cost (for learners and teachers)
  - Proportionate salaries of teachers and learners
  - Rent for buildings and physical environments
  - Technical equipment
  - Marketing expenses
- Effectiveness of training measures.
  Basically, it is the Return on Invest (ROI) that measures the effectiveness best, as organizations will not spend time and money on training that does not have an impact.
  Further to the established Kirkpatrick Model [9] with four levels of training evaluation:
  - Reaction (level 1): Learners appraise the training in regards to their engagement and job relevance,
  - Learning (level 2): Learners evaluate the training in regards to acquired knowledge, skills and attitude,
  - Behavior (level 3): Learners actually apply what they have learned during the training back in their jobs,
  - Results (level 4): Degree to which the intended/aimed outcomes are demonstrated as a training result

  The following guiding questions have to be answered to evaluate the effectiveness of training measures:
  - What is the long-term impact of the training measure to the individual learner or group of learners?
  - Did the training help to improve abilities and fill skill gaps?
  - Do the learners apply what they learned and did their work performance improve?

A Learning Needs Analysis (or sometimes called Training Needs Analysis,) evaluates kinds and volumes of training required by the business functions, taking strategic objectives and operational needs into account.

## 4 ENGINEERING TRAINING PROGRAM STRUCTURE

GETpro has a modular structure. According to the module specification [1] each module is defined by 'Learning Goals', 'Content' and 'Methodology'. The 'Key facts' section provides additional information, such as the language of instruction, expected entry requirements, for whom the module is designed for (the 'target group'), indicative numbers of the participants ('group size'), the duration and learning materials ('documentation').

This can be broadly mapped onto a standard module specification structure used at UK Higher Education (HE) institutions.

For example, at the University of Northampton (UoN) the module specification documentation involves the following key components

- Pre/co-requisites
- Module overview
- Indicative content
- Learning outcomes
- Learning, teaching activities/ time/ hours
- Assessment activities / hours
- Alignment of learning outcomes and assessment

In this context, it appears that the seed campus module structure would benefit from a clearer assessment strategy. In terms of education standards there are two main principles in assessing for learning quality [2]: formative, to provide feedback during learning; and summative, to grade learners so that an index of how successfully the learner has performed when the teaching and learning (T&L) activities have been completed is defined.

To provide the necessary rigor in the GETpro program (Figure 3 shows the structure of the program) relevant activities are considered be introduced as a post-event summative assessment, such as on-the-job assessment (check, that learners apply what they learned). In addition, formative assessment elements could be introduced as pre-event activities. This strategy would be designed to ensure the assimilation, at the appropriate level, of a body of knowledge necessary in the achievement of the outcomes for each GETpro module.

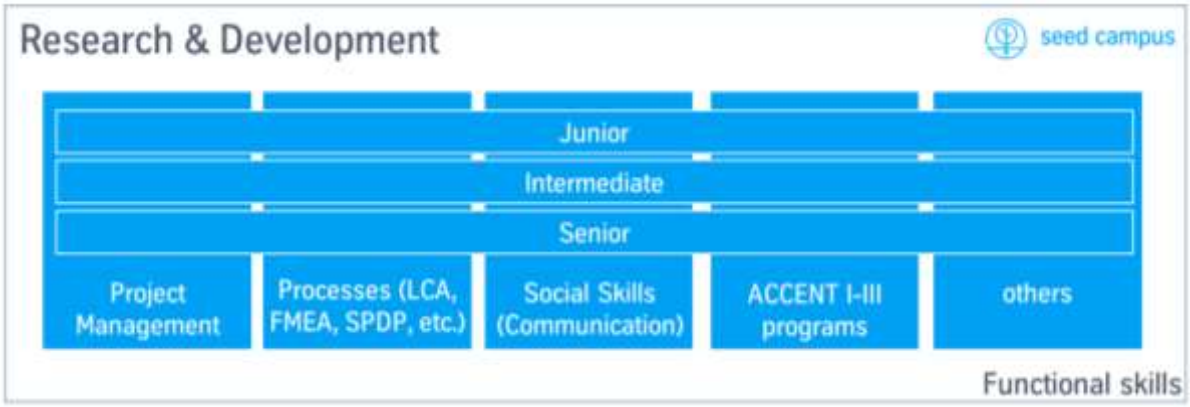


**Figure 3 GETpro structure (principle)**

## 5 TEACHING AND LEARNING METHODOLOGY

The GETpro program is delivered through a range of T&L methods. Those include mainly traditional face-to-face (on-campus / classroom) activities such as presentations, workshops, and

group work. Modern Educational Technology (EdTech) such as e-learning (via web conference) is also applied.

The advantage of ET is its ability to engage learners in their own time and activities that might be difficult to implement in the traditional classroom mode. The interactive use of ET can involve both synchronous activities (in the same timeframe) and asynchronous (communication takes place in one's own time). Those can involve, for example, interactive simulation tools, virtual classroom environments, discussion boards. The latest trends and developments include the use of tools powered by Artificial Intelligence (AI) [3] such as chatbots in learning and development for employees [4]. These appear to be opening new avenues for advanced ET techniques.

ET involves also distance (or off-campus) learning (DL)/ teaching. The UoN has developed and has been offering lifelong learning (LLL) / adult learning (AL) DL program in E&ET for over 30 years. Historically, it was initiated following the introduction of the first edition of the European standard EN 81-1:1977 (introduced in the UK as BS 5655-1:1979) [5]. The UK Lift Industry needed a wide ranging re-education of its workforce in both the Design and Field service. The need to update the workforce was recognized by the then National Association of Lift Makers (NALM), now the Lift and Escalator Industry Association [6]. They also recognized that due to the wide geographic dispersion of potential students, (DL was possibly the best mechanism for delivery [7].

In this context GETpro would benefit from the DL mode being combined with the traditional face-to-face (conventional classroom) methods. Students could then engage in learning more effectively.

The multi-national nature of the seed campus program raises further issues. Difficulties in teaching international students in HE are well known and are often seen as 'cultural' in origin (such as reliance on rote learning and passivity) [2]. But bearing in mind the professional caliber and international experience of GETpro adult learners, this does not lead to adverse problems in engagement in effective learning. However, the fact that learners come from different cultural backgrounds sometimes leads to some difficulties that can be minimized through innovative T&L methods.

## 6 POTENTIAL AREAS OF IMPROVEMENT TO THE CURRICULUM

The key success factors of any learning curriculum are business relevance and efficiency and effectiveness.

Therefore, and to ensure a successful learning curriculum, it is essential to double-check the relevance of the offered content with respective stakeholders and customers on a regular basis.

On the other hand, the guiding question should be: What can be done to make Learning more effective and (cost) efficient. In that regard, Education Technology (EdTech) is key to success:

- Mobile devices and mobile applications support and help prepare the learner for the next career step
- Bringing EdTech into the classroom is an effective method to engage with the learner in all learning styles.
- EdTech gives learners the opportunity to enhance the interaction and collaboration with their network.
- EdTech gives teachers the opportunity to develop a digital literacy across all ages and experience levels (of a multi-national, global lift manufacturer).
- Integrating EdTech in learning & development helps learners to stay engaged. However, in Distance Learning, the instructors miss the opportunity to observe whether learners are recording the content by taking notes. In classroom training this indicates activity and attention.

As EdTech in OLEs does not provide this essential feedback, digital learning content is usually designed in short chunks to ensure not to collide with the attention span of an individual.

- Combining new EdTech like Virtual Reality with traditional Instructor-led-training (ILT) is one example to introduce new technology into the learning experience
- With EdTech, the traditional *passive* learning model breaks up, as classroom or mobile technology changes the role of the teacher into the direction of an encourager, adviser or coach.

## 7 CONCLUSION

The seed campus curriculum portfolio comprises of a comprehensive set of courses. The structure of the portfolio involves diverse learning schemes and modules which is designed for the modules to complement each other

For example, considering the 'Accelerated Engineering' training scheme offered at two levels, with ACCENT2 designed for technical R&D staff with 1-5 year experience and ACCENT3 aiming at a more senior level (specialist/ managerial) staff.

The scheme facilitates contribution from other modules and thus accelerating the staff training process. The ACCENT2 requirements stating 'Basic understanding of elevation systems technology' sounds a bit vague and stating pre-requisites more clearly might be of benefit.

Education Technology transforms the learning experience and generates a huge amount of new opportunities:

With the consideration of a learner-centric approach (e.g. Open Learning Environments) and different learning styles [8], newest technology and the fact that knowledge and learning sources are available 24/7 can revolutionize learning and development in Higher Education.

Especially the customization of the learning experience according to individual learning preferences will increase the efficiency of learning.

It is recommended to put some emphasis into the analysis of the learning population to be able to offer learnings that are the best possible fit to learners needs.

These aspects should be taken into consideration for the next generation of the seed campus curriculum.

The success of these new ways of teaching of the next generation of the seed campus curriculum should be investigated and measured, for instance with a study that compares the old learning experience with the new learner-centric approach.

Different cohorts with different learning styles and cultural background should be an ideal user group for an online questionnaire assessment.

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## BIOGRAPHICAL DETAILS

Thomas Ehrl has worked for thyssenkrupp Elevator AG, Germany since April 2008, and has been Head of seed campus Global of thyssenkrupp Elevator AG, Essen; Head of Research & Innovation Center of thyssenkrupp Elevator Innovation GmbH, Rottweil; Engineering Training Manager at Corporate Level of thyssenkrupp Elevator AG and Manager R&D Project Standards at Corporate Level of thyssenkrupp Elevator AG. He is a Mechanical Design Engineer (receiving his degree in 1994), a part-time PhD student with the School of Science and Technology of The University of Northampton, and his professional career started in 1994. He is married with one son of 16 years old. His interests include travelling, mud races, running, soccer, music, vintage English motor cycles and networking.

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Jonathan Adams graduated from the University of Bradford in 1990 with a B.Eng. degree in Electrical and Electronic Engineering. He holds a Certificate in Education from the University of Leicester, and an M.A. in Continuing Education from the University of Warwick. He also holds a PhD in Engineering Education. His industrial background is in the lift-making industry where he spent nearly 10 years. He has been employed at The University of Northampton for over 20 years specialising in distance education for the lift industry. He is currently Head of Department of Engineering & Technology. His research interests include teaching and learning strategies used in continuing and engineering education, and in the use of electronic methods for delivery, assessment and support. He is a Teaching Fellow of The University of Northampton.

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