

4 Fit Future

Higher Education Institution Guidelines



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1. Introduction

Companies are under constant pressure to innovate for remaining competitive on the market. The complex environment makes a pure reliance on trend analysis no longer enough to understand future development in their industry. Particularly, the high-tech sector is vulnerable to combinations of long-term technological, societal and cultural change, comprising several dimensions of uncertainty related to technological change, especially the difficulty of identifying use cases for new technology and dependence on complementary inventions. Yet, HE offerings focus predominantly on educating (future) strategists in developing short and middle term (2-7 years) strategies.

Far-future strategic decisions, however, need to be built on a sound long-term technology future scenario (LTFS) development methodology that is different in so far as it needs to consider not just trend forecasts, but also tacit visionary knowledge. Developing multiple LTFSs for a future more than 10-20 years ahead supports companies in anticipating and making sense of possible shifts in their industry due to emergent technologies, wildcards like the recent COVID19 pandemic, and sociocultural change, and in validating business innovation ideas. High-tech sector companies would greatly benefit from an HE curriculum which provides a valid framework and a reliable methodology to develop LTFS enabling conscious choices in long-term strategy making.

FIT4Future stands for “Far-Future Strategy Development for STEM Higher Education Teachers”, provides an answer to these challenges, by offering a space for Higher Education Engineering teachers, who want to upskill for introducing so-called Long-Term Future Scenarios (and its topics) into their regular teaching portfolios and activities. Long-Term Future Scenarios build the bridge between the results of future research and traditional strategy development and offer a concrete, company-specific outlook for the next 10-20 years. The methodology is different in so far as it not only considers trend forecasts, but also tacit visionary knowledge.

FIT4Future aims at an innovative curriculum at European HEIs in STEM by adding the lacking long-term perspective to strategic management teaching and fostering future employability of students with developed skills in high-tech companies. Students are targeted as the final beneficiaries. Students in STEM-related fields are currently being trained in traditional strategy making, but relying on pure trend analysis alone is not enough, and companies, especially from the high-tech sector, need professionals, who can develop Long-Term Future Scenarios. FIT4Future allows HEIs to provide their students (either in bachelor, master or specialization courses) with training in a new field and methodology important for developing sustainable long-term strategies, which enables the students to make sense of long-term trends, which they can use to engage in a meaningful way for and with their company.

2. Why a FIT4FUTURE HEI Guidelines?

The pioneer and future-oriented science, technology, engineering, and mathematics (STEM) curriculum and updated strategy-making related study courses reflecting the needs of the high-tech industry, and the related strong collaboration network, make higher education institutions more attractive to students and STEM higher education (HE) teachers. FIT4Future aims that the STEM HE teachers will have updated skills and knowledge, increasing scientific research and publications. HEs can apply the long-term technology future scenario (LTFS) method to develop (or adapt) curricula to long-term trends ensuring these are future-

oriented. To enable this in an efficient way, FIT4Future will be developed based on a large-scale mapping of the current curricula, the needs of HE STEM teachers, and available educational contents.

The present FIT4FUTURE HEI guidelines aim to introduce the HEIs (and more concretely the members of the management and governing bodies, as well HR departments) to the FIT4FUTURE concept and learning approach, and explain the benefits of embedding LTSF in teaching. To enhance the ease of the take-up examples on HE institutions that have already fostered and promoted LTSF in their teaching, or that have used the FIT4FUTURE concept and results in particular are included.

It addresses explicitly how HR departments can integrate the concept and results into the professional development of the HE STEM teachers, and indications with regards to recognition of skills for exchange programs, as well as the alignment and steps towards recognition in NQFs and EQF.

3. FIT4FUTURE in a nutshell

The FIT4FUTURE project is founded in the identified learning needs of the target group. Its contents are available, together with other materials such as videos, audios or links to further reading, in the specially designed online learning space, where teachers (and other interested parties) can access the training course and the LTFS methods and materials developed to innovate in their teaching approaches. The usefulness and appropriateness of these materials has been tested by numerous teachers participating in the FIT4FUTURE pilot, and some of the LTFS methods have also been tested in activities with students.

In this chapter we provide a quick insight into the main results from the project, for more detail and access to each of the described results, please visit: <https://benefit4future.eu/>

3.1. FIT4FUTURE Curriculum

The FIT4FUTURE Curriculum was developed based on the a large scale mapping exercise of current curricula, the needs of HE STEM teachers and available educational contents. Its objectives are to increase learners' knowledge on long-term future forecasting and to meet the training needs of HE STEM teachers for teaching long-term future forecasting.

The curriculum outlines the training modules that address the gaps and focus on providing HE teachers with the adequate knowledge to better teach long-term future forecasting in their curriculum. The curriculum is set up with different modules that are practical and easy for HE teachers to use.

The Curriculum formed the basis for the development for the FIT4FUTURE training programme. As such it provides the HEIs (and more concretely the members of the management and governing bodies, as well HR departments) with the context and background insights into the training programme. The Curriculum is accessible through the FIT4FUTURE website.

3.2. FIT4FUTURE Training

The FIT4FUTURE Training brings together a suite of learning materials, which together provide a full programme for the introduction of LTFS in the courses of an HEI. The materials have been developed to allow for customisation and adaptation to the different courses and curricula of each institution.

The training consists of the following components:



BASICS

LTFS METHODS

LTFS EXPERIENCES

LTFS DEVELOPMENT DATA SOURCES

ADDITIONAL RESOURCES

3.2.1. Basics

This module introduces the topic of long term future scenarios, and focusses on the understanding of scenarios in decision making at organisation level and the methods used for LTFS.

3.2.2. LTFS Methods

This module provides details about the methods used in LTFS developed, such as fuzzy cognitive maps, analysis of science of fiction novels and films, science fiction prototyping, flash fiction stories, trend extrapolation/trend impact analysis , Delphi study and cross impact analysis.

3.2.3. LTFS Experiences

This module is complementary to the module on LTFS methods, and provides real life examples from companies and research that incorporate LTFS methods.

3.2.4. Data and additional sources

These additional components of the training provide access to data and additional sources, which can be used in providing LTFS training and/or to drill deeper into the topic. These can be used to extract additional learning materials for both teachers and students.

The data sources provide access to 39 data sources which can be used in the development of LTFS. They represent data sources from different countries and different sectors.

The additional resources have been selected for their connection or relevance for teaching LTFS. The resources could be used to enhance the quality of instruction that target LTFS incorporation.

All of this content is adapted and selected to provide the best possible library of information on LTFS and to make it easy for teachers to use in the classroom.

3.2.5. FIT4FUTURE Teacher guidelines

Teacher Guidelines aim to motivate HE STEM teachers to use the FIT4FUTURE program and increase their knowledge and skills in the field of creativity LTFS teaching. This guide explains what FIT4FUTURE is and introduces them to the concept and topic of LTFS in STEM education, while at the same time emphasizing the benefits of the results for them. It aims to provide a step by step approach on how to use the FIT4FUTURE in the best way.

4. FIT4FUTURE in the EQF

The FIT4FUTURE training is framed within the European Qualifications Framework (EQF) consists of eight different levels, each of which represents a specific range of knowledge, skills, and competences associated with qualifications. These levels are designed to facilitate the comparison and recognition of qualifications across European countries.

FIT4FUTURE has been designed to be used by teachers and trainers who provide education and training on the following EQF levels:

- Level 5 - Higher Education Skills: qualifications obtained through higher education, such as undergraduate degrees. It represents a higher level of knowledge, skills, and competences.
- Level 6 - Bachelor's and Professional Degrees: associated with advanced knowledge and skills.
- Level 7 - Advanced Master's Degrees and other specialized qualifications in higher education. It reflects a high level of expertise in a specific field.

If we are looking at the continuous training for teachers, FIT4FUTURE aligns with EQF Level 4 - Advanced Vocational Skills: Qualifications at this level represent further development of vocational skills and knowledge, often achieved through vocational education and training (VET) programs at an intermediate level.

The FIT4FUTURE training programme is not a formal proposal, but a flexible training over time, which all those interested in learning more about LTFS and integrate it in their teaching activities can access online from wherever and whenever they want.

Both the different components as described before, and the structure of the e-learning environment have been specifically designed to fit the needs of the target group, making FIT4FUTURE an informal alternative for teacher training that is well suited to boost and improve their teaching activity, according to their own individual needs.

But the components and materials can also be used by an HEI's human resource or talent development department and set up their own training course adapted fully to the needs of their specific teachers.

5. Recommendations for taking-up FIT4FUTURE

Continuous training of teachers and educators is an essential component to ensure the uptake of innovative approaches, such as proposed by FIT4FUTURE, in any educational institution, especially in technical courses, such as engineering, where knowledge is constantly evolving.

Nevertheless, bearing mind the workload of teachers, a formal, more traditional type of training course, might not be the best option. This is why the FIT4FUTURE learning content and materials have been designed in such a way that teachers can use them for self-learning, but at the same time are flexible enough to be used by the HR or career development area to design a blended learning approach. The best approach is the one that aligns with the HEI's internal processes and the preferences of their teachers.

In a self-learning setting teachers can design their own learning pathway adapted to their time, availability and preference. In the case of opting for a fully online, self-learning approach, we recommend to organise an introductory or preparation session to present FIT4FUTURE, and its components. In case of a blended learning approach, the first session is the one then to be used to introduce the content and components to the participating teachers.

Here are some recommendations and ideas, based upon the consortium's experience in the project, in the piloting and based upon the feedback obtained.

5.1. Reflect

Before any implementation it is important to reflect on the following 2 questions, as their answers will help to focus the strategy and convince the teacher body to participate.

- Why is FIT4FUTURE be beneficial for teachers in the institution?
- What objectives are to be achieved by applying FIT4FUTURE knowledge and skills for both teachers and students?

The answers to these questions are the baseline for the implementation of FIT4FUTURE.

5.2. Find support

The best way forward to introducing new topics and methodologies is not to impose, but involve from the start those that will be the ones actually in charge of making online creativity teaching a reality, i.e. the teachers.

Make sure their involvement is real and not "just for show", listen to what they have to say and ensure that their ideas are taken up and reflected in the action plan. Without their full support, there is a risk all will fall down as a house of cards.

The commitment of the group is stronger than the commitment of an individual teacher. That is, if one can engage a department or several teachers, these will support each other and share their progress and experiences in the classroom with each other, thus fostering knowledge exchange.

5.3. Evaluate

To evaluate the success of the FIT4FUTURE training and implementation it is necessary to monitor the results from the training activity on the teachers as well as on the classroom and on the students.

The strategy's monitoring and evaluation require both a quantitative and a qualitative component. KPIs are used to perform quantitative monitoring and evaluation. Choosing the right key performance indicators (KPIs) to focus on is the first step toward measurable improvement and thus strategy success, and choosing the right KPIs is dependent on a good understanding of what is important for your institution's strategic roadmap. What can and is measured gets better.

6. Concluding remarks

From a managerial point of view, there are three dimensions that need to be taken into account when considering the uptake of FIT4FUTURE in a HEI.

The first dimension is the one related to the impact and activities for teachers, where for instance one can organise workshops on LTFS for teachers to make them acquainted with the topic, or to integrate it into the HEI's regular teacher career development and training offer.

To motivate teachers to take up FIT4FUTURE and participate in training activities, either as self-learning or through the courses or sessions organised in the HEI. Teachers that participated in the piloting (in the case of the partner HEIs) can function as ambassadors on the learning and topic and motivate other teachers. In the case of HEIs not involved in the project the best option is to identify teachers most enthusiastic to the programme. Make sure to allow sufficient space and time for knowledge and experience sharing. A Community of Practice can be a good way to achieve this.

Teachers when using LTFS with their students can use the AI tool developed within the framework of the project to generate scenarios.

One could even consider using the LTFS methods with the teachers to gain insights into how they see their field of education in the future.

The second dimension is the impact on students. Even though it is an HEI or teacher who decides to integrate FIT4FUTURE in the teaching or learning activities of the interest of students needs also to be sparked. Generating awareness among students about the relevance of the LTFS skills for the future careers is thus important. Explain them that with LTFS they can help visualise and shape the future. Also reflections of already active professionals, in particular ex-alumni, on the usefulness of LTFS in their daily work can be not only important to generate interest but can also make classes more engaging, e.g. through experiential masterclasses.

The third dimension is related to the management aspects of the introduction of FIT4FUTURE, the activities can be embedded in a wider strategy of the HEI for social impact and social innovation. The methods can be used not only for the HEI's own strategic road mapping, but also to involve the wider ecosystem or local community in which the HEI is based and jointly with the local stakeholders think about the long term future for the community and how the HEIs fits in the vision and can support it.