



HIIT Recommendations

Guidelines for HE institutions

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1 Introduction

HIIT is a project co-funded by the European Commission's Erasmus+ programme, aimed at fostering new innovative approaches in STEM (science, technology, engineering, mathematics) in Europe.

The Recommendation Guide for HE Institutions introduces the HIIT concept, raises awareness and knowledge on how to integrate instructional technology into higher education of European HEIs, and explains how the HIIT e-learning space and content can be used to reach this objective.

As such the present guide, supports them in using the HIIT approach and materials to integrate instructional design and technology in higher education. It encourages HEIs to explore how to take a more strategic approach to embedding innovative approaches towards Innovative teaching into their courses, and how to support their teachers to take this up in their work with their students, in particular in face-to-face, online or hybrid learning environments.

This guide first gives insights into the materials developed and the HIIT e-learning platform and then gives some ideas and recommendations on how to take it up across your institution.

2 The HIIT Project

2.1 Context

According to a recent OECD report, the COVID pandemic has had “a severe impact on higher education as universities closed their premises” and although quick to replace face-to-face lectures with online learning, “to remain relevant, universities will need to reinvent their learning environments so that digitalisation expands and complements student-teacher and other relationships”. The extensive use of digital devices and applications enables this to happen. Therefore, educators must develop their digital skills and adapt to more innovative teaching approaches. This is supported by the voice of the students.

While it is important to support HE teachers in developing digital competencies; this is not sufficient; they must change their perspective and way of teaching to ensure that no student is left behind. Instructional Technology provides an answer to the challenges. It goes beyond digital tools and ensures a more applied systems approach that accommodates successful learning technologies.

In HIIT, Instructional Technology refers to the creation of engaging, effective learning experiences using available technological tools for pedagogical purposes and motivation. It concerns the design, development, use, management, and evaluation of the process of learning mediated by technology applications.

STEM education has a strong practice and lab-based component in the pedagogical approach which adds on more challenges compared to the transfer to online teaching of more theoretical subjects or courses. We will do this by creating an ontology (to help map tools to requirements), a repository (comprising digital tools, good practice examples and cases) and a curriculum specifically targeted at the needs of HEI STEM teachers.





2.2 Objective

The main aim of HIIT is to equip HE STEM teachers with the self-efficacy, competencies and skills needed to understand the principles and constructs of Instructional Technology and rapidly leverage these to mitigate the impact of closure and safeguard the inclusive nature of learning opportunities.

The HIIT framework enables HE STEM teachers to understand how to take maximum advantage of learning technologies and digital tools in subject-specific teaching and learning systematically. It will build digital education readiness and help them to implement instructional technology principles horizontally across their teaching and pick the right technology or tool for the right context so that they can meet their learning goals.

3 Who is this guide for?

These recommendations are targeted at managers, HR managers and educational experts of HEIs who provide education in the field of STEM and although aimed at those active in Higher Education, the HIIT approach and results can be equally relevant and useful for those who are assuming these roles for VET bodies that offer STEM-related courses.

We believe that HIIT can be of relevance to any education or training professional in the area of STEM who is interested in instructional design and instructional technologies in STEM-related areas in many contexts e.g., face-to-face, online as well as hybrid learning contexts.

Therefore, although HIIT is specifically developed for the aforementioned HEIs its versatility allows a much wider range of educational levels to use it.

In the end, the students are the final beneficiaries. With HIIT HEIs are better prepared to adopt engaging, effective learning experiences using technology that ensures the realisation of the pedagogical objectives, student motivation and skills attainment.

4 What does HIIT offer?

Before examining the strategic implementation of HIIT in STEM education at the institutional level, it is crucial to comprehend the various components and available options. The materials and components are tailored explicitly for educators specialising in HE STEM subjects. At a higher level of management and strategy, it is crucial to understand what benefits individuals will gain from a particular initiative. This understanding will enable you to effectively support their work and tackle the issues faced by the organisation and STEM areas.

4.1 Upskilling

With our curriculum and learning materials, HE STEM teachers can be upskilled and will know how to use effective instructional design and technology (and with the appropriate pedagogical approaches and digital tools).

The goals of the HIIT Curriculum are:

- To provide teachers with an understanding of what is instructional technology
- To provide teachers with knowledge on how to use technological tools in the learning process





- To provide teachers with the knowledge on how to design, develop, manage, and evaluate the teaching process of learning mediated by technological tools
- To allow participants to engage in effective learning experiences using available technological tools for pedagogical purposes and motivation.
- To introduce to the participants new, innovative technological tools to motivate their students in their learning process
- To provide teachers with the ability to decide how to use instructional technology for students who have learning barriers

The learning materials consist of 3 modules and 15 units, which provide learners with specific knowledge on instructional design and how to implement it. Below is a summary of what teachers can expect in each of the units.

Module	Unit
Instructional Technology	Unit 1: Instructional Technology Unit 2: The attributes and characteristics of Instructional Technology Unit 3: The values and benefits to Instructional Technology Unit 4: The challenges of Teacher Level Instructional Technology Unit 5: The challenges of School Level Instructional Technology
Instructional Design	Unit 6: Instructional Design Unit 7: The importance of Instructional Design Unit 8: The Design Principles Unit 9: Flexible Instructional Design Models Unit 10: Linear Instructional Design Models
Instructional Technology for Learners with Learning Barriers	Unit 11: Steps to adapt your teaching methods and course content for instructional technology and/or Instructional Design Unit 12: What to bear in mind when using technology and digital tools in a setting with students with learning barriers Unit 13: Different learning barriers and implications on the approach/tools of your course Unit 14: How to select the right technology/tool for the different types of students, course content and/or type of teaching (fully online/blended/f2f) Unit 15: Tips and tricks on how to prepare





Each unit has short quizzes for self-evaluation. Taking quizzes is a voluntary action for completing the units.

Testimonials are also provided as they reflect the thoughts of HE STEM teachers on subjects such as the importance of instructional technology, the benefits of good instructional technology), the challenges faced; the impact and the preferred methods.

The content is adaptable and suitable for training and preparing teachers in various educational approaches and for the specific needs of engineering teachers. It can be utilised at the institutional level to develop a targeted training course for teachers, either through a blended learning or fully online format.

4.2 Toolkit

The HIIT toolkit is a recompilation of different methods and techniques that can aid HE STEM teachers in introducing instructional design and technology into their classes. They have been classified to facilitate ease of navigation, e.g. size of the group, type of classes, type of activities and length of the activity. We have collected a total of 45 methods, techniques and tools, so it will be easy to find a tool or method that will be helpful for your teachers.

First, the technique is introduced, by explaining what it is about, where it comes from, and for which purpose it is used. Tips and tricks on how to use it and how to implement it online are provided, with testimonials from teachers who have used the technique in their teaching. A set of additional resources allows us to drill deeper into the specific technique and learn more.

From a more strategic perspective, the toolkit can be helpful as a complement to the upskilling activity. For instance, by working with a sample of your teachers on deciding which tools to use first and then exchange knowledge about their experience and how the tool or method affected the student's learning process. This way you can evaluate which tools or methods are the most appropriate ones for your institution before rolling them out throughout all the engineering courses.

4.3 HIIT e-learning space

All the content mentioned above can be found in the HIIT e-learning space which has been designed to facilitate access and provide an easy and friendly user experience. Our experience in the piloting with HE STEM teachers shows it is very intuitive.

5 Recommendations for taking up HIIT

5.1 HIIT for continuous training

Ongoing professional development of teachers and educators is crucial to ensure the adoption of innovative methodologies, such as those suggested by HIIT, in all educational establishments, particularly in technical disciplines like STEM, where knowledge is continuously advancing.

However, considering the heavy workload of instructors, a formal and conventional type of training course may not be the most suitable choice. The HIIT learning content and materials have been specifically intended to allow teachers to engage in self-learning. Additionally, they are adaptable for usage by HR or





career development departments to create a blended learning strategy. The optimal strategy for your institutions is the one that corresponds with your internal procedures and the preferences of your teachers.

In a self-directed learning environment, where the HIIT content is readily accessible, educators have the flexibility to tailor their learning trajectory according to their schedule, availability, and personal inclination. If you choose to pursue a completely online, self-directed learning method, we suggest arranging an initial or preparatory session to introduce HIIT and its elements.

For a blended learning method, the initial session should acquaint the participating teachers with the material and components.

We have full confidence that the design of the materials, the extensive range of tools and approaches, and the design of the e-learning environment will be highly flexible to the specific requirements of the teachers in your institution.

Having been persuaded to create a strategic action plan for implementing HIIT, we now provide recommendations and ideas based on the consortium's project experience, pilot testing, and feedback received.

5.2 Reflect

Before any implementation, it is crucial to contemplate the following two questions, as their responses will aid in directing your method and persuading your professors to partake.

- What is your rationale for believing that HIIT will be advantageous for teachers in your institution?
- What specific goals do you aim to accomplish by utilising your knowledge and skills in HIIT for both your teachers and students?

5.3 Find support

Developing a strategy for enhancing STEM education that is both unique and engaging should not be imposed, but rather collaboratively devised with the educators who will be responsible for implementing online creative teaching methods.

The collective dedication of the group surpasses the dedication of a single teacher. If you can involve a department within your organization or many teachers in online instruction on creativity, they will have the opportunity to share their advancements and experiences in the classroom, promoting the interchange of knowledge and mutual motivation.

Invite possibly interested teachers to join a roster of creative learners inside the organization and inquire if any of them would be open to delivering a brief session on the utilization of the tool or method to other interested instructors.





5.4 Motivation, motivation and ... motivation

Incentivize your teachers to actively participate in the development of the action plan: fostering a sense of ownership among your teachers regarding the action plan will enhance their dedication and enthusiasm to facilitate its execution. Ensure their engagement is genuine rather than superficial, attentively listen to their perspectives, and ensure that their ideas are incorporated and represented in the action plan. In the absence of their complete endorsement, there is a potential for failure.

To encourage people to carry out the action plan, it is important to publicly acknowledge their experience and participation, recognize their effort, and, if feasible, link rewards or recognition programs to their exertion. Foster an environment that encourages individuals to willingly share positive experiences while also expressing their concerns about any inefficiencies.

5.5 Evaluate

To assess the effectiveness of the HIIT programme and its execution, it is essential to closely monitor the outcomes of the training sessions for your teachers, as well as the impact it has on classroom dynamics and student performance.

Monitoring and assessment necessitate the inclusion of both quantitative and qualitative elements. Key Performance Indicators (KPIs) are utilized to conduct quantitative monitoring and evaluation. Selecting appropriate key performance indicators (KPIs) is the first stage in achieving quantifiable enhancements and, consequently, strategic triumph. The selection of suitable KPIs relies on a thorough comprehension of the crucial aspects of your school's strategic roadmap. Improvements are achieved by measuring and monitoring what is capable of being measured. Some examples of KPIs you might use include:

- Number of teachers that use HIIT tools or methods regularly,
- Number of HIIT tools or methods used regularly,
- Number of teachers that have experience with a certain type of HIIT tool or method,
- Number of teachers willing to train and share their knowledge with others,
- % of improvement in the teachers' skills,
- % of improvement in student motivation.

For teachers to learn how to navigate the e-learning space and take advantage of the learning content, refer them to the **HIIT - Recommendations for HE Teachers**.

