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Designing an interactive course based on gamification by educators and VET providers

Projektowanie interaktywnego kursu opartego na grywalizacji przez edukatorów i dostawców VET

Słowa kluczowe: VET, interaktywny kurs, grywalizacja, rozwój kompetencji, szkolenie, materiały szkoleniowe.

Streszczenie: Artykuł stanowi podsumowanie prac przeprowadzonych przez międzynarodowy zespół ekspertów w ramach pierwszego rezultatu pracy intelektualnej projektu *i-CONTENT: Zestaw narzędzi dla trenerów VET do projektowania i rozwoju interaktywnych gier edukacyjnych,* finansowanego z programu Erasmus+. Celem projektu było wsparcie trenerów i organizatorów kształcenia i szkolenia zawodowego prowadzących nieformalne kursy wstępne i ustawiczne VET, którzy chcą przekształcić typowy kurs w interaktywną naukę online opartą na grywalizacji (uczenie się asynchroniczne i synchroniczne), umożliwiając im tym samym zaspokojenie bieżących potrzeb rynku i ukierunkowanie na rynek globalny. Partnerzy z pięciu krajów (Polska, Włochy, Grecja, Cypr, Wielka Brytania), przeprowadzili badania dwóch grup docelowych – trenerów VET i uczniów, w celu określenia, jakie narzędzia online wykorzystywane są przez trenerów do tworzenia kursów online, co skłania uczniów do zapisania się na kurs online oraz jakie główne elementy są ich zdaniem niezbędne do utrzymania zaangażowania i co wpływa na atrakcyjność kursu. Na podstawie wyników badań autorzy opracowali *Przewodnik po projektowaniu interaktywnego kursu internetowego* zawierający informacje na temat projektowania atrakcyjnych i skutecznych treści kursu przed przejściem do fazy rozwojowej, sposób ustalenia celów i opracowania struktury, a także określenie efektów kształcenia.

Keywords: VET, interactive course, gamification, competence development, training, training materials.

Abstract: The article is a summary of the work carried out by an international team of experts as part of the first intellectual output of the i-CONTENT project: A Toolkit for Educators and VET providers for the design and development of online interactive gamified content, funded by the Erasmus+ Programme, which aims to serve Trainers and VET providers (mainly SMEs) delivering non-formal initial and continuous VET courses who wish to transform the typical classroom led course delivery into an online interactive gamified learning experience (asynchronous and synchronous learning) allowing them to meet current market needs and enabling them to target the global market. Partners from five countries (Poland, Italy, Greece, Cyprus, United Kingdom) conducted research on two target groups – VET trainers and students, in order to determine what online tools are used by trainers to create online courses, which prompts students to

enroll in an online course, and what key elements they believe are necessary to keep the course engaged and what makes the course attractive. Based on the results of the research, the authors have developed "A guide for the design phase of the interactive phase of an online course" containing information on designing attractive and effective course content before moving to the development phase, how to set goals, structure, and define learning outcomes.

Introduction

The global COVID-19 pandemic has dramatically changed the approach to teaching by maximizing the use of digital technologies in education (Haleem, et al., 2022). The growing popularity of digital forms of education began to be used on a large scale, e.g. in the enterprise sector, but they did not meet with much favor in the education sector (Facer, Selwyn, 2021). This was particularly visible among organizations and people who conducted vocational training, as they assumed that online training was less effective than traditional training due to the need to implement expensive infrastructure, time-consuming digitization of content, and the development of additional skills that they do not have (Li, 2022). However, the latest research shows that adult students are more likely to choose digital training than traditional training (OECD, 2020), as long as it is attractive and includes an element of gamification (Landers, et al., 2019). Such training shows the same or even greater educational potential than their traditional counterparts, and they are more willing to engage training participants (Bouchrika, 2023). Therefore, VET course providers face the challenge of designing and creating e-training content that will increase the attractiveness of training content by transforming traditional courses into digital, game-enhanced courses (Cedefop, 2022), and thus respond to the current market demand (Mihelac, 2021).

Desk research and questionnaire surveys conducted by experts from Poland, Great Britain, Cyprus, Greece, and Italy have proven that the greatest fear and barrier to transforming traditional courses into online courses are technical capabilities, lack of appropriate knowledge about technological solutions, and lack of competence to develop properly structured training step by step. This vulnerability was exploited by the i-CONTENT project consortium to provide VET providers with comprehensive tools to design an interactive training course. As a first step, a handbook was developed to define activities and content that support trainers, teachers, mentors, and VET providers in implementing the i-CONTENT training course and materials and help them familiarize themselves with the aspects of interactive training with elements of gamification, as well as the process of developing a competency map directly related to the profile of students, on the basis of which they can develop tailor-made educational materials. This article describes the method of developing the guide and elements of its structure.

Research methodology

The first stage of the research part was desk research, which aimed to adopt uniform didactic principles that should be taken into account when creating training in

order to fully use the potential of interactivity and gamification in education. The authors then developed two questionnaires: one aimed at learners and the other aimed at trainers involved in creating online content.

The purpose of the first questionnaire was, firstly, to identify what prompts a learner to enroll in an online course, and secondly, to identify the main elements that they believe are necessary to maintain engagement with an online course. It consisted of the following questions:

1. How important are the following in an online course?: (*1 being not important to 5 being very important*)
   a) Structure and logical order of topics
   b) Variety of learning methods (videos, mind maps, step-by-step instructions)
   c) Have online support / a tutor to ask questions
   d) Having the option to choose Modules/topics of interest without the need to do the whole course
   e) The videos, slides and content to look professional
   f) Be able to compete with other learners (view their scores) in a gamified setting
2. If you wish to learn a topic online, please indicate your learning preferences: (*1 being the least and 4 being the best method*)
   a) Watch a short Video
   b) Read text
   c) Get the information in pictures
   d) Have real time (synchronous) teaching
3. If you are watching a video to learn a topic, what is the maximum number of minutes the video should be for you to stay focused?
   a) 1 min
   b) 2 min
   c) 3 min
   d) 4 min
   e) 5 min or more
4. Which elements you feel are important as to complete an online course?
   a) Get the feeling that I make a progress
   b) Evaluate my knowledge often as I progress in the course
   c) Have support from a Tutor
   d) Have the option to attend online synchronous (real time) lectures
   e) Be able to interact with other students
5. Which gamified elements would make you more committed in a course?
   a) Leaderboards - View how the other learners are performing and compete with them
   b) Points – Evaluate my progress through a points system
   c) Badges – Earn a badge every time a complete a task
   d) Timers – Perform tasks within time constraints

6. Please write down the top 4 things from your experience in taking online courses that have helped you complete the course
7. Please write down 4 things from your experience in taking online courses that discouraged you in finishing the course

The second questionnaire, on the other hand, was aimed at obtaining information from VET trainers, firstly, whether they have developed an online course so far, and secondly, how important, in their opinion, are the individual elements of the online course. It consisted of the following questions:

1. Have you ever developed an online course?
   a) Yes (*continue with question 2*)
   b) No (*continue with question 6*)
2. Which software have you used for the development of content?
   a) PowerPoint
   b) Word
   c) Udutu
   d) Adobe Captivate
   e) iSpring
   f) Articulate
   g) H5P
   h) Other (please state)
3. Which LMSs (Learning Management Systems) have you used to host your content?
   a) Moodle
   b) iSpring LMS
   c) Blackboard
   d) Canvas
   e) Kajabi
   f) Other (please state)
4. Select or state any gamification techniques that you have used in your courses:
   a) Points
   b) Timers
   c) Leaderboards
   d) Badges
   e) Other (please state)
5. State the top 5 things, starting from the most important to the least important, for the development of a successful online course
6. How important are the following aspects in an online course? (*1 being not important to 5 being very important*)
   a) Structure and logical order of topics
   b) Variety of learning methods (videos, mind maps, step-by-step instructions)

c) Have online support / a tutor to ask questions
d) Having the option to choose Modules/topics of interest without the need to do the whole course
e) The videos, slides and content to look professional
f) Be able to compete with other learners (view their scores) in a gamified setting

7. From your experience as a trainer, which methods learners prefer in order to learn a topic? (*1 being the least and 4 being the best method*)
   a) Watch a short Video
   b) Read text
   c) Get the information in pictures
   d) Have real time (synchronous) teaching
8. From your experience as a trainer, which elements you feel are important in order for the student to successfully complete an online course?
   a) Get the feeling that he/she makes a progress
   b) Evaluate his/her knowledge often as he/she progresses in the course
   c) Provide support from a Tutor
   d) Provide the option to attend online synchronous (real time) lectures
   e) Be able to interact with other students
9. Which gamified elements you believe would make a student more committed in a course?
   a) Leaderboards - View how the other learners are performing and compete with them
   b) Points – Evaluate my progress through a points system
   c) Badges (Earn a badge every time a complete a task)
   d) Timers – Perform tasks within time constraints

The above questionnaires were distributed among the target groups. The first questionnaire was completed by 10 learners in each partner country (50 in total), and the second questionnaire by 10 trainers in each partner country (50 in total). Based on the research results, the authors have developed a guide that supports the creation of an interactive course using elements of gamification.

Main findings from desk research works

Thanks to desk research, the authors have identified a list of didactic principles that should be considered when creating an interactive training course. While the range of pedagogical tools currently available is very attractive, there still seems to be a large gap between the teaching methods considered to be the most effective and those actually used in adult education (e.g. lectures, computer simulations, and business games, project work and in groups, visits to companies or work placements). Hence the need to define the most optimal rules that will fully use the potential of interactivity and gamification in education. The identified didactic principles are presented in the table below (Table 1).

Table 1. Didactic Principles

Didactic principle	Description
The training should be learner-centred	Teaching incorporating interactive and gamification elements requires a pedagogical approach centred on the target group. Trainers should use a bottom-up strategy that takes life experiences of the target group into account. Adult education should allow the use of models that entourage target groups to continue learning throughout their experience. This approach should be focused on the interests and competencies of target groups.
The didactic approach should be based on autonomous, active or experiential learning	Interactivity and gamification should be based on experiential learning. Competencies and skills can be acquired or built only through hands-on, real life learning experiences. In opposition to the traditional approach, the target group should have an active role and grow autonomous gradually. In this perspective it's essential to prepare them to be able to think for themselves, considering the possibility to learn through 'errors' (the perspective of the 'good error'), encouraging the use of feelings, attitudes, and values, also when dealing with conflict situations. In this context, the possibility of 'learning by doing' becomes very important. The trainers and VET providers (both as regards face-to-face or remote courses) should encourage the target group to learn autonomously, also through self-reflection and with the use of self-evaluation tools.
The target group motivation is a key factor for the success of the learning process	The motivation of target groups is considered one of the main problems the VET education faces. Trainers should use different approaches to motivate learners and they should facilitate experiential learning and use ICT solutions as much as possible. Furthermore, when training pe ople at work it is important to ensure that teaching content is relevant to career development and personal growth aspirations of the staff. Training that draws on real-life scenarios and case studiem to which learners can relate is naturally far more interesting and motivating at the same time.
Digital Technologies and ICT tools should be considered as fundamental resources for VET learning	The added value of technology for VET education and cultural awareness raising resides in access to: a) resources, b) information retrieval tools, c) sharing knowledge, d) communication tools, e) mobile fruition, f) flexibility in the training path.

Source: own study.

Structure and content of materials developed on the basis of questionnaire research

Training modules developed by the authors were built in accordance with the ECVET (European credit system for vocational education and training) principles as a set of learning outcomes – in terms of knowledge and competencies/attitudes – that a trainee should achieve when participating in the i-CONTENT training course. As most EU countries have synchronised their national framework with the EU directives, the partners have defined that the training material developed should allow students to reach Levels 3 and 4 of the EQF (European Qualifications Framework) standards as described in the table below (Table 2).

Table 2. Levels 3 and 4 of the EQF standards

Level	Knowledge	Skills	Responsibility and autonomy
	In the context of the EQF, knowledge is described as theoretical and/or factual.	**In the context of the EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).**	**In the context of the EQF responsibility and autosomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility.**
3	Knowledge of facts, principles, processes and general concepts, in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	Assume responsibility for completion of tasks in a field of work or study; adapt own behaviour to circumstances in solving problems.
4	Factual and theoretical knowledge in broad contexts within a field of work or study.	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.	Exercise self-management within the guidelines for a given work or study context that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of given work or study activities.

Source: Description of the eight EQF levels, Europass, European Union.

Based on the above-mentioned European Qualifications Framework, the authors developed the content of the guide using the results of questionnaire surveys, thus maximizing the didactic effects of the materials. The guide has been divided into four parts, which in a holistic way provide comprehensive knowledge on how to properly design an interactive course based on gamification by educators and VET providers. The authors also defined in detail the learning objectives and learning outcomes for each part of the guide. The results of the work are presented in Table 3.

Table 3. The i-CONTENT guide structure, learning objectives and learning outcomes

<table>
<tr><th colspan="2">Part 1: Content organisation and structure</th></tr>
<tr><td colspan="2">Aim</td></tr>
<tr><td colspan="2">The aim of this part is to show that the design of the structure of the educational content is particularly important, especially as regards the remote education environment that calls for the optimisation of the learners' educational experience, due to the trainer's lower contribution or physical absence. This means that the educational material and its content must be designed and structured in a way enabling the performance of these activities and aiding the learning process in the best possible way.</td></tr>
<tr><td colspan="2">Learning Objectives</td></tr>
<tr><td colspan="2">The first part covers the following learning objectives:
1) the structure of the content
2) the use of the course map
3) the development of the module learning outcomes
4) the assessments of the skills gained
5) the activities to facilitate engagement, practice, and transfer of learning
6) the development of the instruction (including learning materials, resources, and key principles)</td></tr>
<tr><td colspan="2">Learning Outcomes</td></tr>
<tr><td>Knowledge
After the completion of this part the learner will be able to:</td><td>Skills
After the completion of this part the learner will be able to:</td></tr>
<tr><td>1) define the structure of the content
2) describe the use and benefits of the course map
3) identify the specific learning outcomes for each module
4) determine the assessments of the skills gained
5) list the activities to facilitate engagement, practice, and transfer of learning
6) determine the instruction (including learning materials, resources, and key principles)</td><td>1) apply the structure of the content
2) develop and implement the course map
3) outline and align learning outcomes for each module
4) select and apply the most suitable assessments of the skills gained
5) adjust and use the activities to facilitate engagement, practice, and transfer of learning
6) outline the instruction (including learning materials, resources, and key principles)</td></tr>
</table>

Part 2: Content Visuals and Animations

Aim

The aim of this part is to present different resources and activities which can be developed when the visuals are created. The target group should know the overall theme of your online training program. That includes the font type, the colour scheme, and the tone of the narrative. It's essential to set the standards from day one so that everyone's on the same page. This keeps the online training course design cohesive and well-organized.

Learning Objectives

The second part covers the following learning objectives:

1) the steps to develop the visuals of the course
2) the choice for the course logo
3) the choice for the course colour scheme
4) the choice for the course character/avatar
5) the creation of the course navigation elements
6) the creation of layouts (including e.g. transition, animation effects, fonts)

Learning Outcomes

Knowledge *After the completion of this part the learner will be able to:*	**Skills** *After the completion of this part the learner will be able to:*
1) list the steps to develop the visuals of the course 2) characterise the importance of the right choice for the course logo 3) characterise the importance of the right choice for the course colour scheme 4) explain the impact of having the course character/avatar 5) identify the types of the course navigation elements 6) define the design principles of creating layouts	1) develop the visuals of the course 2) design/establish the right course logo 3) apply the right course colour scheme 4) select the most suitable course character/avatar 5) select the most suitable course navigation elements 6) apply the design principles of creating layouts

Part 3: Choosing and Using the Right Ecosystem of Tools and Content

Aim

The aim of this part is to decide how to combine different available tools to produce a learner-centered approach, which, as data suggest, is the most effective approach for an online course. In order to accomplish this, it provides a current snapshot of the different tools for online training, and some rules of thumb and points to consider in order to combine them into successful online training. To streamline the process and the workflow of the course itself it is needed to consider at least these elements included in part 3.

Learning Objectives	
The third part covers the following learning objectives: 1) the concept of the ecosystem of tools and content 2) the elements of the ecosystem of tools and content 3) the choice for the ecosystem of tools and content	
Learning Outcomes	
Knowledge *After the completion of this part the learner will be able to:*	**Skills** *After the completion of this part the learner will be able to:*
1) define the concept of the ecosystem of tools and content 2) describe the elements of the ecosystem of tools and content 3) characterise the importance of the right choice for the ecosystem of tools and content	1) apply the concept of the ecosystem of tools and content 2) employ the proper elements of the ecosystem of tools and content 3) choose and apply the right tools and content
Part 4: Making Content Engaging and Interactive	
Aim	
The aims of this part are the following: to build activities that encourage them to co-create and peer review; to create exercises that help students reflect on their own perspectives and learn from one another; to combine sharing and commenting with gamification — this makes any course more interactive; to interact with students as they work (comment on a document as it is drafted online, drop into a chat room or simply acknowledge students in live sessions); to hold online office hours and encourage students to come and bring their questions; to create micro-lectures combined with silent activities and group work; to record lessons. Most online courses use video format because it is engaging and enables the students to hear and see the trainer and the trainer can illustrate his/her points visually.	
Learning Objectives	
The fourth part covers the following learning objectives: 1) the European Framework for the Digital Competence of Educators 2) the difference between the gamification of learning and game-based learning 3) the influence of the game on learning	
Learning Outcomes	
Knowledge *After the completion of this part the learner will be able to:*	Skills *After the completion of this part the learner will be able to:*
1) describe the European Framework for the Digital Competence of Educators 2) describe the difference between the gamification of learning and game-based learning 3) explain how the game influences learning	1) interpret the European Framework for the Digital Competence of Educators 2) distinguish between the gamification of learning and game-based learning 3) examine and use proper games to improve learning

Source: own study.

Conclusions

Designing an attractive interactive course based on gamification requires educators and VET trainers to comprehensively learn about the mechanisms of online education and the expectations of the target group to whom the course is to be addressed. Thanks to desk research and questionnaire research, the authors defined in detail the steps and actions necessary to meet the task of developing an engaging course user. Creating such a course should start with structuring the training content (in modules and training units), defining learning outcomes for this content, developing a methodology and form of assessment, individual tasks, and preparing instructions. The next step is to design the graphic identification of the course, which consists of logo design, color palette selection, possible selection of the character/avatar accompanying the learner, design of navigation elements, graphic layout, transition effects and animation, and development of a prototype. Then it is needed to select and apply the appropriate set of tools and content, and thus specify in detail what type of the course is designed, adopt a user-centric approach (choose communication channels, content, learning process), and choose the tools that can be used (LMS systems, communication tools, streaming, repositories, community management, systems supporting the development of interactive content). Thanks to this, the course creator will be able to increase the attractiveness and interactivity of the content, and thus positively affect the effectiveness of the learning process. Following the above guidelines will help in the process of designing an interactive course from scratch, but also in translating a traditional course into an online course, and will also improve the digital competences of adult educators and VET trainers, which are included in the list of key competences recommended by the Council of the European Union.

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