BEST PRACTICE 01	TYCON in higher VET
Context of use	The TYCON was presented within the context of higher vocational education and training in the construction sector. Players played TYCON as a traing option in the more general context of going through an entire value chain of a small housing project. The overall context was operational and in particular entrepreneural training, where TYCON fitted perfectly in terms of digital simulation of a real life building site. TYCON was played in several groups of entirely 39 participants. The observations were almost identical, so that the results can be harmonized hereafter. The game was played indirectly and collectively; it was transmitted to a screen via beamer, because the participants did not have individual access. However, the participants had the possibility to operate the game via the lecturer's PC.
Target group	39 participants of level 4 and 5 EQF in full time higher VET
Observations and evaluation	As the target group was from higher VET, it was conceded by the instructor, that this game is also available for late stages of initial training, which was welcomed by this groups because they thought that entrepreneural competence should have been conveyed to them earlier in the vocational training than in the higher VET courses. Hence, the spectre of late initial VET into higher VET for playing TYCON was not criticised rather than appreciated. Each of the three groups played TYCON for about 60 minutes. Prior to the examination the link for playing TYCON in German language was sent to the group members: (https://emergo.ou.nl/emergo/skins/ounl2/run.zul;jsessionid=65016098B70BB5004D0278757DAE6E24?cacId=8656&tagId=1&runstatus=previewreadonly&rgaId=8749&rutId=&lang_lang=de&lang_count=DE&lang_var=&unique_par=75A6122B772695D0005ED760488351BE00845099258B1) This was important, because some of the participants had tried to start the game on site, but the attempt had ended after the introduction video. Subsequently, the game was played on the instructor's PC with two or three volunteers operating the game and the other participants being involved in the decisions ("What do you think?"). The experience has shown a good handling with some preferences for the controls being better visible and immediately for a better overview

	and not only after reading other tasks. A start from all levels would be highly appreciated. Mr. Buttinski´s role and function as well as the game explanations were easy to adapt. There was broad acceptance of him as a consultant, which means that the role was not interrogated. Nevertheless some astonishment prevailed. Reason for that was that it was rather unlikely that a start-up entrepreneur will be involved in such big tasks like renovating a church or a castle. Smaller projects were more realistic. The remark that TYCON is not primarily about the construction technique and the technical efforts, but more about the entrepreneurial ability to carry out such a project was noted, but still not considered a realistic scenario by the target groups. At level 1 almost all participants decided to build a playground (size is realistic for start-ups). An explanation why their decision was not successful and the other one was successful was highly appreciated but not given by TYCON. The only "clumsy" explanantion by Mr. Buttinski that the business idea was bad was little helpfull. Subsequently there raised a discussion about why an idea to carry on in TYCON in this or that way could be good or bad and for that some participants brought in their own experiences from the real life. Hence, TYCON gave the impulse for a discussion about entrepreneural decisions! Level 2 was initially considered realistic by all participants; advising interested customers reflects an entrepreneurial ability. However, the subsequent discussion in TYCON was perceived as somewhat unrealistic. In an entrepreneur´s life performance of a company is only in third or fourth place. Price and adherence to delivery dates are the first things to be considered. All in all, the participants would have liked to learn more about the constructional orientation of the contract, i.e. more details about why it actually works. Only then professional advice can be provided. Nevertheless the level was rated as instructive, although the composition of PowerPoint presentations does not correspond to the actual activities of (start-up) entrepreneurs. Level 3 was considered interesting by all participants because a real construction site scenario was described, each participant could put him/herself in the situation. Serious consequences for the operation, the building and the unhappy colleague were discussed. Then an attempt was made to solve the task of putting the discussion sequences into the right order. However, this was not successful, after the 5th or 6th attempt the participants broke off. Here they looked for help in the game, the simple explanation of the avatar that the order was wrong was unsatisfactory.

Recommendations	When all case leads are playable in all levels, the game should be played again. The major focus in higher VET is obviously on the technical side. The business aspects of the case leads must be worked out more clearly. Lecturers should integrate the game into teaching concepts with necessary preparation and follow-up time has to be taken into account. Learning with serious games is usually not part of higher VET and also not in vocational training. The use of TYCON might stand for a voluntary feature. Lecturers should be convinced of the usefulness of the game. They should find the counterpart of the real construction branch in it. Overall, TYCON needs to be explained by instructors in order to prepare the players for the overall learning objective (entrepreneurial thinking and acting). The technical aspects of construction should not be neglected in order to attract the participants who stem from the more technical site of construction. The connection between particular construction and technique related challenge and entrepreneurial reaction to the challenge better corresponds to reality.

BEST PRACTICE 02	Piloting at an apprenticeship fair
Context of use	The TYCO(O)NSTRUCTOR game was supposed to get used by young adults intending to start their own business in the construction sector. Thus the conduct was a first small-scale piloting with students of high-schools during an apprenticeship fair. Plan was to invite about 10-15 learners to try out the TYCON game during the fair at the stand on a mobile laptop or on their own mobile devices (mobile phones, tablets). Following this test, the participants recorded their experiences and their assessments of this learning method by means of a standardized questionnaire. This questionnaire was based on the template already developed in the TYCON project. Before having started the game, all participants received a short introduction by a moderator in order to clarify intention and context of the game with all participants. The evaluation of this questionnaire particularly focused on the question whether the learners could imagine using this method of informal learning as a basis for the acquisition of entrepreneurial skills. Furthermore, the survey focused on which entrepreneurial competences could be acquired with the game from the participants' point of view, whether the message of the game was presented in a comprehensive way and what potential for improvement the users have identified.
Target group	This fair approaches older students from high-schools (aged up to 18 years old) who intend to inform themselves about career possibilities

	in various professions such as the construction sector. Older learners are in particular very appropriate for a mid-scale pilot, as they often have a very high understanding of digital learning forms, like to try out new procedures and they are very open to express their opinions in the planned surveys. These factors made them very important and meaningful participants in a pilot study.
Observations and evaluation	The participants were observed during the test procedure by project staff. Their reactions were incorporated into a report for the project. It was expected that the facial expressions and gestures of the participants could provide additional information about which phases of the game were particularly appealing or which phases require further explanation.
Recommendations	

BEST PRACTICE 03	TYCON at university level
Context of use	The TYCON prototype was used as an ad-hoc addition to a construction degree module for Academic and Professional development. This module focuses on developing students' professional skills as aiming to enhance employability. The module has been designed as a set of individual games that target particular soft skills of students. In most situations these games are group activities. There is no obvious link between weekly activities so introducing TYCON was not standing out of the context. Students were doing the activity individually in the computer lab where each student had his/her own station. There was a short introduction by a tutor as to what was expected from students and then they were asked to complete a questionnaire.
Target group	The target group consisted of 2nd year construction discipline university degree students (architectural technology, quantity surveying, building surveying, construction and project management). The age group was between 20 and 22 years old and predominantly male. The group that game was used was cc 30 students.
Observations and evaluation	Students were given a questionnaire with the range of questions related to the relevance of the content as well as the experience of the game. A majority of students agreed that the content of the game is relevant to their profession. The experience of the game received mixed reaction. In an overall summary there was an observation of slight interest and motivation to engage at the game. Having said that the experience of TYCON was very limited as the content has not been

	developed fully for university students to see the overall intention of the game. The target group may not be the best for this kind of experience as the degree students at second year do not see themselves as self employed and running the construction business, at least not until they had several years of experience in construction industry.
Recommendations	In order to exploit maximum relevance of TYCON for the undergraduate students a more holistic approach need to be taken before the game is used. Firstly it maybe better if the game is incorporated within the personal tutoring scheme – individual discipline tutorials that cover a wide range of student issues and are targeting a smaller group of students. The game should be a part of the overall topic of employability and self employment as one of the career options. Students need to be prepared in advance – setting the scene / setting the frame of mind. Through this experience, at present very few students even think about self employment and therefore any issues dealt within the game are not even thought about.

BEST PRACTICE 04	TYCON was applied on a medium grade training cycle of vocational training for technicians in interior works, decoration and rehabilitation. It stood for a pedagogical tool to convey learning outcomes of a professional module focused on entrepreneurship to engage an entrepreneurial initiative.
Context of use	TYCON was used with a group of students and trainers in the mid-term in a medium grade training cycle of vocational training of technicians in interior works, decoration and rehabilitation. This medium grade vocational training covers two years with 2,000 hours including 200 hours of training in the workplace. Students particularly gain competences to become professional experts in planning and carrying out interior works as well as mastering main decoration techniques and comprehensive learning about renovations in homes and buildings. Students seek to become professionals who work in the construction sector, i.e. small, medium and large construction companies as well as in public administrations. They work either as employees or as a self-employed people. Tasks are: developing interior works and decoration for construction, rehabilitation, maintenance and reform in buildings and civil works.

	During the advanced phase of training the students undergo a work based learning experience or traineeship in a company which is considered as a practical workplace training. This is meant to learn about starting and managing companies as well as to succeed in professional contexts Students accessed TYCON using personal computers while following the course online. Each student played the game individually. The students also provided feedback on views of the prototype of TYCON via online forms.
Target group	This educational training deals with competences necessary to carry out basic management for establishing and running small companies. Additionally it deals with required skills to yield entrepreneurial initiatives in any given professional activity with a sense of social responsibility. This training content has a design to demonstrate entrepreneurship-related skills both to employees assuming responsibilities in medium to big sized companies and to self-employed workers in start-ups. This training aims to achieve the following objectives: - by means of procedures related to entrepreneurial culture, business and professional initiative, to carry out basic management of small companies or to undertake jobs - by developing teamwork and valuing the organisation, participating with tolerance and respect and taking collective or individual decisions to act responsibly and autonomously - by adopting and valuing creative solutions to problems and contingencies that arise in the development of work processes to responsibly resolve the incidents of their activity - by recognising rights and duties as active agents in society, taking into account social norms and legal frameworks It is the first formal approach for students to study entrepreneurship, having mostly developed knowledge, skills and competences through experience and non-formal education. TYCON was used as an interface in which students could “safely” put into practice the knowledge skills and competences they already have gained concerning entrepreneurship. Through TYCON students were encouraged to reflect on their sets of skills and how to improve them

	through vocational training and mandatory work based learning. TYCON allows to reflect on how opening up to a European market can improve opportunities of building and consolidating professional careers.
Observations and evaluation	Both, the practical and theoretical activities will be reinforced by embedding TYCON scenarios and resources in course structures. The use of real life examples is essential as it presents students with realistic challenges that encourage critical thinking and improve the degree of autonomy. To embed TYCON as a pedagogical tool in learn settings, students´ specific knowledge acquisition level is to be taken into account throughout the process. Indeed profiles of students in a particular vocational training cycle is scientific and technological. For the most part, they lack in-depth knowledge of the business world. TYCON's approach is ideal as it allows for a first hand contact with a professional environment. There are two main characteristics essential to achieve a precise embedding into module dynamics: - from students perspectives: when tackling theoretical aspects, there is a need for resonance between concepts studied in a classroom and TYCON (i.e.: same definition of "initiative", same steps for the definition of business plans…) - from teachers perspectives: possibility to navigate TYCON and use it as a "tool box" isolating different elements of the game where necessary in order to allow for a diversified use of TYCON and not only a "linear" one (possibility to implement exercises, resources and assessments from different case scenarios separately) Particulary the TYCON scenario "Start up" was used to illustrate the following themes of the module: 1. Entrepreneurship: Key factors of entrepreneurship: initiative, creativity and training The action of entrepreneurs as businessmen/women in small and medium sized companies related to interior works, decoration and rehabilitation The entrepreneur: requirements for exercising business activities Business plan: the business idea in the field of construction

	2. The company and its environment: Basic functions of companies Analysis of environments generated by construction-related to SMEs Analysis of specific environments of construction-related to SMEs Relationships of construction SMEs with the environment and with society in general 3. Creation and start up of companies: Types of companies Choice of legal form Economic viability and financial viability of a SME related to interior works, decoration and rehabilitation Business plan: choice of legal forms, study of economic and financial viability, administrative procedures and management of grants and subsidies As far as an assessment of a specific module are concerned, practical "group work activities" are recommended to be carried out by groups of up to 3 students. Students are asked to undertake a cooperative project which will consist on creation of a comprehensive business plan within a field related to construction. Theoretical components in the assessment of modules consist of examinations on theoretical contents delivered at the beginning of each theme.
Recommendations	The TYCON methodology is both practical and theoretical applying a participative scheme. Students work in groups to elaborate business plans. There is need for the players to apply theoretical knowledge gained in class and practical skills acquired by means of examples, group dynamics and gamification activities to accomplish and fine tune their business plans. TYCON provides a first hand approach to professional environments. It incorporates possibilities to commit mistakes and improve. Introducing TYCON, this idea has been presented to players who reflect in groups of 3 upon the added value of serious games and how to compare this to real life experiences. TYCON´s division in units ensures an execution of activities related to each one of the elements constituting a structure of a business plan. Each unit concludes with drafting of significant sections of business plans as follows:

	UNIT 0 EXECUTIVE SUMMARY UNIT 1 INTRODUCTION UNIT 2 MARKET ANALYSIS UNIT 3 TECHNICAL-PRODUCTION PLAN UNIT 4 HUMAN RESOURCES PLAN UNIT 5 INVESTMENT PLAN AND LOCATION UNIT 6 ECONOMIC AND FINANCIAL PLAN UNIT 7 LEGAL FORM The practical activities include: - cooperative problem solving exercises which involve real case studies - re-enactments of professional situations: hiring interviews, pitching business ideas, conflict management - practical exercises involving market analysis techniques, production and financial planning, human resource management and legal issues Learning outcomes (LO) achieved with particular activities when the module ends: - students knows how to prepare and present a project in a systematic and orderly way - The student recognises the importance of drawing up a business plan before starting a business activity. More broadly the four main L.O. of the module will be: 1. Recognises the skills associated with entrepreneurship, analysing the requirements derived from jobs and business activities. 2. Defines the opportunity for the creation of a small business, assessing the impact on the environment in which it operates and incorporating ethical values. 3. Carries out activities for the constitution and start up of a company, selecting the legal form and identifying the associated legal obligations. 4. Performs administrative and financial management activities of an SME, identifying the main accounting and tax obligations and completing the documentation.

BEST PRACTICE 05	Piloting in a qualification course by an educational foundation
Context of use	TYCON was used within a training program offered on national level by

	an educational foundation. TYCON could mainly be addressed to professionals, migrants and unemployed people and offers also the possibility to acquire certifications (belonging to levels 3 and 4 of the European Qualifications Framework) and/or internationally (e.g. the European Certificate of Digital Literacy). Having tested the first scenario of TYCON (Scenario 1 – Taking initiative) there was an adoption of a classroom setting, giving the participants an introduction on the aims of the project and on the objectives, context and structure of the game (about 15 minutes). In the introduction it was avoided providing details about the different challenges that players would have to face, in order to see if players would have been able to understand them. Participants were also asked to play Scenario 1 individually, using a PC equipped with earphones (earphones are essential because of the many videos that players have to watch during the game). Participants took about 40-50 minutes to complete Scenario 1. After the game was played, players were asked to fill in an electronic questionnaire, where it was asked to evaluate the game experience (about 5 minutes). In the end, there was a closing discussion, asking players, whether they had some more qualitative feedbacks or questions (about 20 minutes). The entire process took about 1 hour and 30 minutes.
Target group	To perform the test 8 students were selected, all with a professional background as non-qualified bricklayers, who were following a professional training course to obtain the title of Construction worker (belonging to level 3 of the European Qualifications Framework). This course was composed by 264 class hours and 72 hours of on-the-job training. Students were almost at the end of that training path. Students were all males with an age ranging from about 18 to 40 years with a mix of cultural origins.

Observations and evaluation	Feedbacks from students were collected either while playing the game (questions arisen by students and difficulties encountered in the game) and by finishing the game (written and oral feedbacks). All observations were written in a text file that had been organised in the following sections:
	• Questions raised by participants during the test
	  ○ General questions
	  ○ Questions regarding Scenario 1, Level 1
	  ○ Questions regarding Scenario 1, Level 2
	  ○ Questions regarding Scenario 1, Level 3
	• Thoughts at the end of the test
	  ○ Positive aspects of the game
	  ○ Negative aspects of the game
	  ○ Other comments
	An evaluation of the performance of students in the game was not conducted.
	While playing it became obvious that some participants were not accustomed to use a PC, so that the simple navigation between windows was a problem. Moreover nearly all participants had problems to understand what to do and how, especially at the

	beginning of the playing session. In the end, the challenges posed by the game were perceived as not so difficult to be accomplished but sometimes difficult to understand (sometimes it was necessary to explain some tasks to some students because they were blocked in the game). Regarding the playing behaviour of students it became clear that the majority of them was involved in the game and committed to achieve the best possible results. Some others, especially the more aged, seemed to be not so interested in TYCON and in its contents. At the end of the playing session, the majority of the participants was satisfied with the experience. They expressed interest in the contents of the game and were interested in knowing their performance. Some even posed questions about the future development of the game as a teaching instrument. Eventually there is the conclusion that this game has a potential to be integrated in related training paths, when some method attentions and target fittings enrich TYCON.
Recommendations	Prior to the test it was clear that the arguments contained in the game were not covered in the professional training course followed by the sample of 8 students. There was the resume that it was definitely too early to expose students to these arguments at this level of study and without any prior in class discussion. Scenario 1 is quite of intuition but repeating Scenarios 2 to 5 with these same students would have been nearly impossible. Moreover, the low computer literacy demonstrated by the more aged participants (one participant did not have a PC at home but, after all, we have also to consider that the PC is not their means of work), created a sort of barrier that made the approach to the training instrument difficult. Observations while testing, talking with teachers of these types of training courses and talking to a crucial branch stakeholder lead to the conclusion that TYCON is rather suitable for the use as training instrument with people with a higher educational level (levels 4 or 5 of the European Qualifications Framework) and following, for example, a professional training as Foreman or micro-entrepreneur in construction field. Another inference was that game to be more suitable for young users, who are able to easy handle devices such smart phones, tablets or PCs. Moreover, TYCON may be more suitable to be played after that the argument touched by the specific level or scenario, has already been introduced by the teacher, following the sequence: introduction to the argument – practical experience playing the game – reflection on game results. Regarding the approach that we used to introduce the game to students, we think that it was the right one because it allowed them to have some information about the game before to actually play it, avoiding to create even more uncertainty at the beginning of it.

BEST PRACTICE 06	TYCON in distance teaching and training
Context of use	Lesson in which TYCON was integrated was conducted with the Google

	Meet online platform. TYCON was presented to the first class students, second class students, third class students and fourth class students.
Target group	Students are attending a professional training center characterized by 3 school years plus a fourth year of specialization. The age of players ranged from 14 to 18 yearsof age.
Observations and evaluation	TYCON was presented to each individual class by placing a screen as the main sharing screen so that all pupils could see the APP. Initially the application was shown to the group in order to explain it chapter by chapter and to be able to compare with students by providing them the opportunity to answer the questions while playing TYCON. Having only one hour of lessons at a time, division in groups was recommended so that also larger classes could interact with each other faster. Instead of having it carried out a result analysis immediately, there was the preferance for a debate among the students, so that a relationship could be created between them, a discussion in order to understand together which was the most suitable solution. Immediately giving the correct answers was not pusued, leaving the students "wrong" with the choice of the most suitable definition for them. TYCON was illustrated for almost an hour, the students were able to independently follow the presentation of the same through the help of their laptop or tablet / mobile phone. The opportunity to illustrate TYCON in class and create a debate in the classroom led to the creation of a very interesting lesson, giving everyone the opportunity to see the reactions live but above all the opportunity to create a classroom game that would have brought good results. Once TYCON was finished together and not having had the opportunity to see the results with the correct answer at each chapter end (change of state) students were asked to play the whole game as homework. Older students were more attentive to TYCON and more results were obtained. Above all of them used to work on construction sites and take autonomous choices or decisions.
Recommendations	TYCON seems to be a good application for construction VET, It gives the possibility to shape a new type of lesson, a lesson that connects different subjects and different topics giving the possibility to compare each other in being able to achieve the objectives set by a game. TYCON can be used giving students from the same city the opportunity to think of scenarios they know personally so they can entertain them with well-known scenarios given their young age. APP should be connected to videos that explain business choices and why something

	is correct or wrong to make certain choices, perhaps by putting prices on individual interventions improvements. TYCON cannot be saved. Being used as a didactic form with more than a few classes, it is not possible to finish it as a debate or as a dialogue, which was created at the end of each unit.

BEST PRACTICE 07	TYCON as a means in “blended learning” settings
Context of use	Online-training as an individual training during the pandemic period in VET schools; part of “blended learning”
Target group	Young students enrolled in VET school programmes to acquire EQF level 5 (similar to such as programmes for construction qualifications “construction technician”), participants were exclusively male
Observations and evaluation	The applied measurements were: online vocational training as a homework; majority of students replied through the evaluation questionnaire; obviously they have not been addressed by the game (only roughly 60 % provided feedback) Observation took place via online-questionnaires during school lessons, which were conducted by distance teaching. Although only 60 % of player provides with feedback, the ones who responded rated TYCON as a promising tool to be used. In terms of satisfaction, players like VET-trainers were delighted to test such a sector-specific and tailor-made application as supporting learning material. TYCON as a different learning tool, which motivates learners, because it is related to gamification, which is an attractive didactic tool and an excellent tool for blended learning.
Recommendations	Lessons, that can be learnt from applying TYCON: - there is a need to adjust introduction volumes to learners´ needs; i.e. maybe more elaborated introductions - TYCON topics could be combined with other similar games dealing with such topics for example: https://eblues.eu/blended-learning/ - be aware who is addressed, because people completely out of reach to become entrepreneur will quit shortly after starting to play - a pre-career paper test can clarify whether a foreseen group of players fit to TYCON - group work in mini games is a method of choice to peer review and reflect on decisions taken within playing - VET-lessons could be introduced with an inspiring speech - pitch of any local or regional contractor or entrepreneur (as construction company director and running business in the construction industry sector or sole entrepreneur – craft works), how he/she started and

	where he/she is now, how the business has grown and what is the reason for growth