AGRIENT:
Enhancing Youth Entrepreneurship Skills, Careers Guidance and Competences in Agriculture Thought a Game based Virtual Reality Platform physics education
Agreement Number: 2018-3-HR01-KA205-060151

Agrient- Enhancing Youth Entrepreneurship Skills, Careers Guidance and Competences in Agriculture Through a Game based Virtual Reality

ERASMUS + 2018-3-HR01-KA205-060151

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AGRIENT – Piloting events and evaluation of the intellectual outputs

Erasmus+

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Executive summary

This document has been prepared in order to present the results of the piloting activities regarding the intellectual outputs of the AGRIENT project. Pilot activities were organized by all partner countries in the last two months of the project. Veleučilište u Šibeniku was coordinating the activity of collecting the evaluation data from the piloting activities, whereas the contribution of the other partners is foreseen in terms of responsibilities for organizing the activities and collecting the participants` answers.

Piloting activities were designed and implemented in order a) to assure the suitability of the developed learning materials and scenarios as well as the 3D Virtual World platform, and b) to improve them according to learners' feedback and requirements of the specific conditions of the 3D Virtual World.

This document summarizes the feedback from the pilot application of the Agrient main output, i.e. the 3D Virtual World platform, regarding the ease of use, the pedagogical methodology, the graphics, the curriculum etc, with the aim of helping partners, institutional stakeholders and other relevant parties implementing Agrient based courses.

Chapter 1, Introduction, explains in more detail the subject of this document, how the training activities were developed, and presents methodologies and didactical structures.

Chapter 2, Report on Piloting activities presents the statistical analysis of the answers to questions addressed in questionnaires that were distributed to the participants to the survey conducted in the project. Within this survey Agrient project has received the feedback and has identified the gaps and needs that needed to be improved together with the overall satisfaction with the intellectual outputs.

1. Introduction

1.1. Training Objectives

The overall objective of the courses was to enhance the young people's interest in agriculture, improve their entrepreneurship spirit and capability, increase their employability and assist them to become successful entrepreneurs and start initiatives in agriculture.
The Agrient's courses content development was structured in 3 main phases:

development of the curriculum for Agrient courses;

development of the learning content and 3D activities;

development of the 3D Virtual Learning Environment and design of the 3D activities.

1.2. Agrient courses development

Two crucial targets needed to be addressed for Agrient courses development: the definition of the training structure and methodology and the development of training modules. The training activities should contribute to the professional training of the involved actors. The main characteristics of the Agrient training are:

- Simple in form;
- Fit to the specific conditions of the 3D virtual learning environment;
- Easy to start;
- Possible integration between modules;
- Focused materials, feedback and support;
- Customization of modules program and training design;
- Provide ongoing guidance and support;
- Provide step-by-step, research-proven materials;

It was essential to select the structure and methodology that would be the most effective for its training environment, considering the factors such as:

- **The overall learning objectives:** what is expected to be achieved through learning? In our case the learning materials support transfer of know-how and innovations through acquisition of new skills and competencies in agro-entrepreneurship. The training puts particular focus to empower the business knowledge and improve advanced entrepreneurship skills. For this aim, also existing pedagogical materials such as photos, related videos, expert teachers, and books are used.

- **Who needs the training:** which categories of trainees will increase training effectiveness and economy? In our case the training is needed by young individuals:
    - unemployed or employed/involved in agriculture sector and want to extend their knowledge, entrepreneurship skills and qualifications;
    - graduates of agriculture educational institutes of all levels;
    - young 'NEETS' that are not in employment, education or training and would like to study and trained in entrepreneurship in agriculture sector;
    - young people with fewer opportunities such as in isolated areas and small villages.

- **The expected learning outcomes:** what each person trained is expected to be able to do, and expected to know, at different stages and at the conclusion of training? Depending on the intensity level of the training and content of the modules, the trainees are expected to acquire specialized agriculture and entrepreneurship knowledge and skills that help them to improve their entrepreneurship spirit and capability, increase their employability and assist them to become successful entrepreneurs and start initiatives in agriculture.

- **The scope of the training methods** is highly dependent on the 3D Virtual World specific conditions. The 3D Virtual World includes, for each course, a series of 3D interactive scenarios that are designed and implemented as part of this output. Finally, the environment features training functionality based on auditoriums, classrooms and media rooms. Apart from 3D activities, assessment tests are part of the virtual learning environment.

1.3. Piloting process and questionnaires

Each partner prepared two documents. One described possible ways of the piloting process and gave basic information about AGRIENT and its courses. The second included technical information, about what piloting participants should setup to be able to get into the AGRIENT 3D Virtual World and implement the piloting process. The documents were delivered to key persons. There were short sessions with the key persons to answer any questions about the use of the platform. Then, the key persons (e.g. VET trainers/educators), distributed the documents to young people (e.g. their students) and made a demonstration to them. The young people afterwards used the platform and completed a questionnaire prepared for evaluation purposes, called the ”Learners” questionnaire. The results are presented in the next section.

Given the extension of the project, due to covid-19 situation, we implemented the evaluation of the AGRIENT output also by trainers/educators and policy makers. So, we prepared another two questionnaires, one for trainers/educators of VET/HEI and one for policy makers, and distributed to such persons to complete after they experienced playing with the 3D Virtual World platform. The results are also presented in the next section.

A young participant, before participating in the piloting activities, had to register and answer a few questions about demographic information and his/her motivation to participate in the piloting. The motivation of the participants for the piloting activities were various, from the desire to acquire knowledge and interact with informal education or apply the virtual world in the educational process, to the interest in starting one's own business, learning more about agritourism and learning applications in 3D Environments, exploring possibilities of supporting distance learning and gamification. VET/HEI and Policy makers participants did not have a separate registration questionnaire.

Registration form and all questionnaires were setup as Google forms.

2. Report on Piloting activities

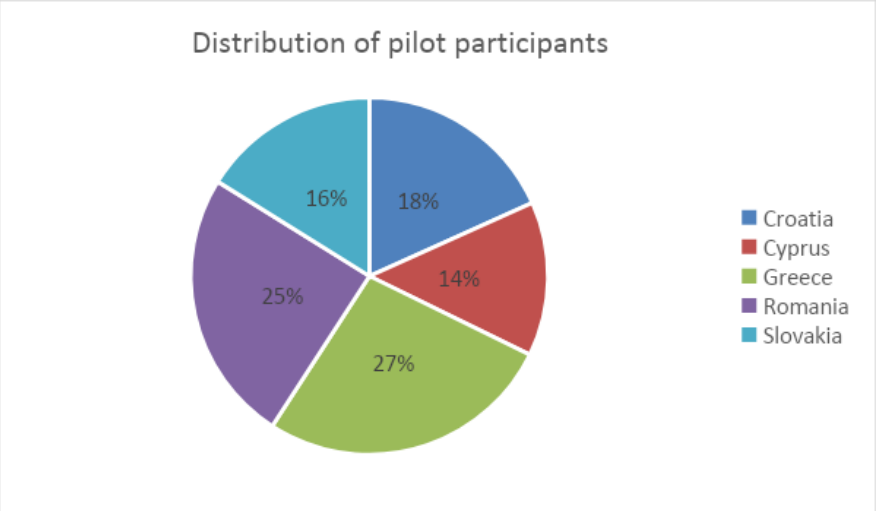
2.1. Learners' questionnaire

After registering and trying the 3D Virtual World AGRIENT platform, each young participant had to complete the main questionnaire. The objective of the main questionnaires were to identify how useful the 3D virtual world platform is for the corresponding target groups and what deficiencies can be identified, so that they are able to improve the educational platform. In the following, we present the results from the three questionnaires.

Probably due to a misunderstanding, some of the young participants although registered and participated in the piloting activities did not completed the main questionnaire (e.g. participants from Greece, Cyprus, Slovakia), but only the short registration one, whereas some others participated in the piloting without registering, but completed the main questionnaire (e.g. participants from Romania). In Table 1, we present the number of participants in the piloting activities.

Table 1

Country	Number of participants
Croația	17
Cyprus	13
Greece	25
România	23
Slovakia	15
Grand Total	**93**



So, 26.9% of answers were from Greece, 24.7% from Romania, 18.3% were from Croatia, 16.1% from Slovakia and 14% from Cyprus (see graph above). The total number of participants who tried out the 3D Virtual World AGRIENT platform and completed the questionnaire was 93, which is much greater than 70 that was designed in the project proposal, although 71 of them completed the evaluation questionnaire.

The distribution of learners-participants among countries that completed the evaluation questionnaire is presented in Table 2.

Table 2

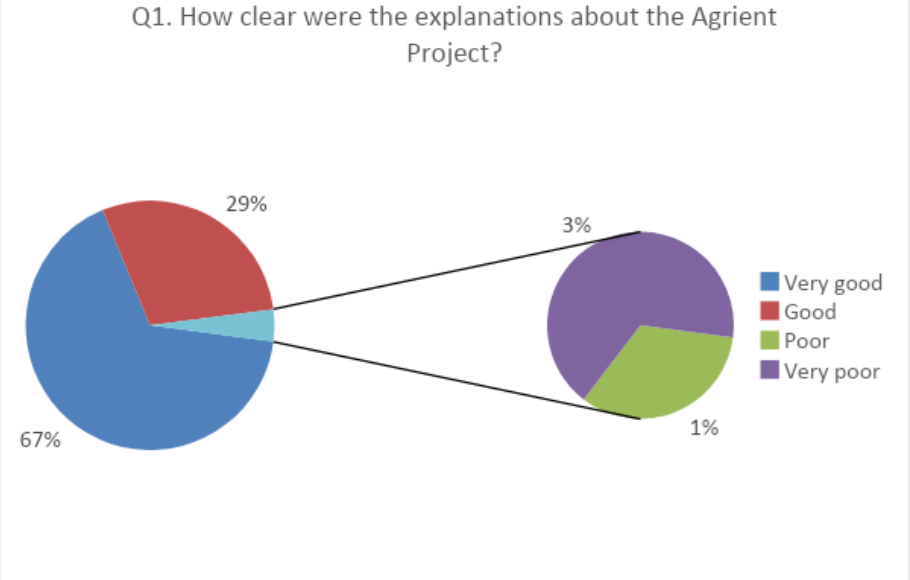
Country	**Number of evaluations**
Croatia	17
Cyprus	7
Greece	21
Romania	23
Slovakia*	3
Grand Total	**71**

So, 32.4% of answers were from Romania, 29.6% from Greece, 23.9% were from Croatia, 9.9% from Cyprus and 4.2% from Slovakia .

The questionnaire included 13 questions, 10 of them of discrete answers and 3 open questions. In the following, we present an analysis of the answers.

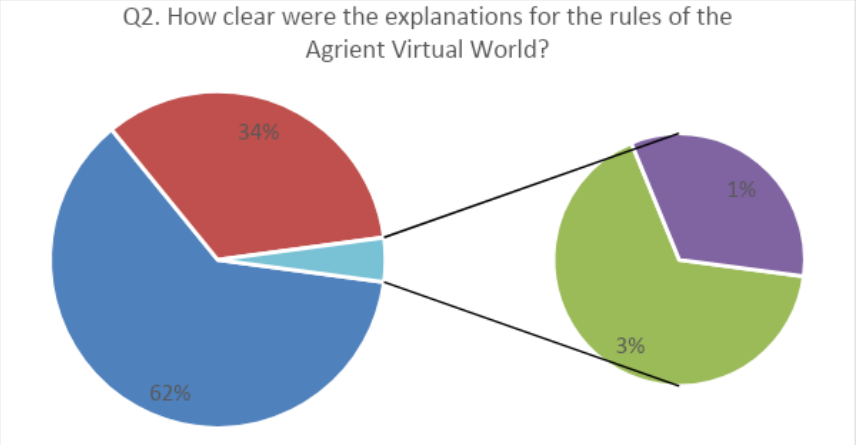
Q1. How clear were the explanations about the Agrient Project?

The results are shown in the following pie graph. It is important that the majority of participants-users very clearly (67%) or clearly (29%) understood what is the objective and the structure of the Agrient project and how the process of piloting would be implemented.



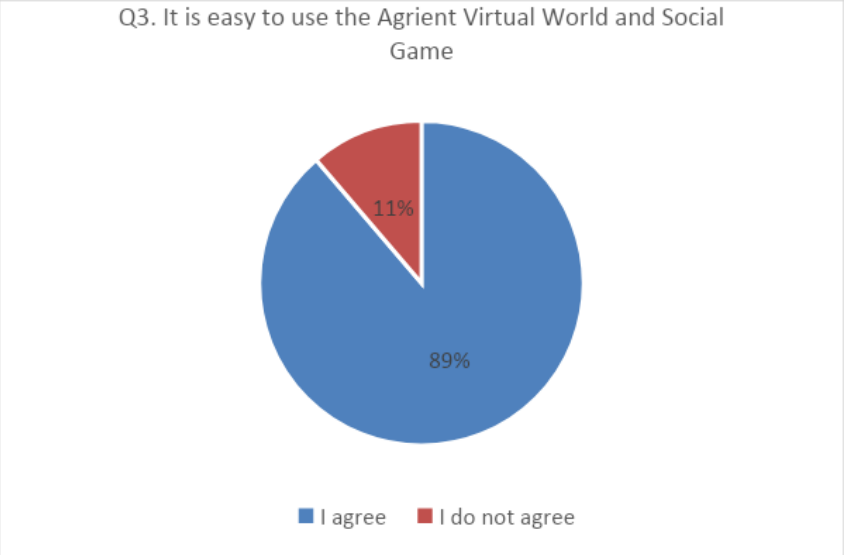
Q2. How clear were the explanations for the rules of the Agrient Virtual World?

It is very important that the explanations of the 3D Virtual World are comprehensive to potential future users. From the survey, it is clear that the explanations for the usage were mostly very good (62%) or good (34%), as displayed in the graph below. It was agreed that each partner will also provide written explanations with the recorded audio and visual instructions as well in order to minimize the possible misunderstandings.



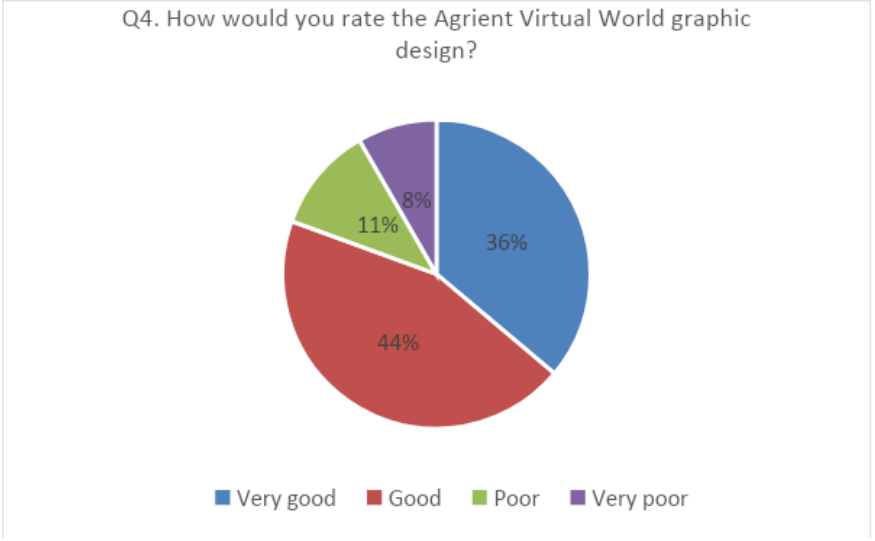
Q3. It is easy to use the Agrient Virtual World and Social Game

89% of the participants feel that it is easy to use the AGRIENT platform. Most of those that do not agree were from Romania pilot event.



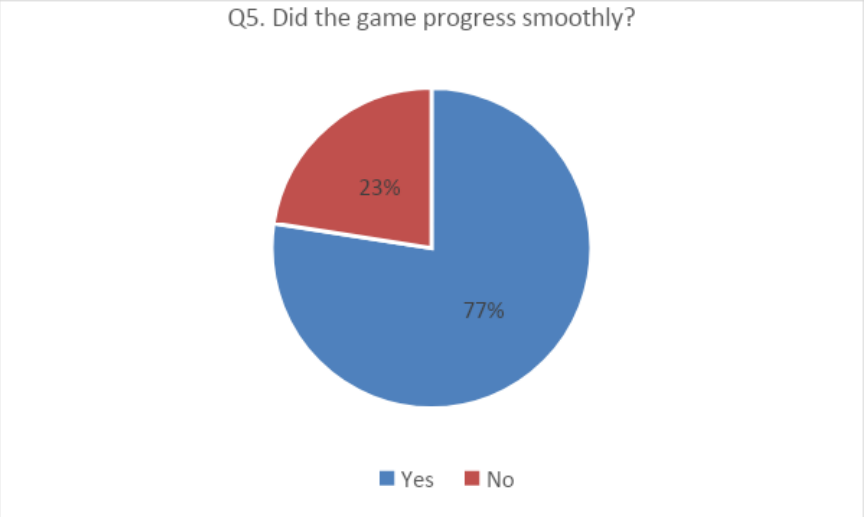
Q4. How would you rate the Agrient Virtual World graphic design?

45% of the participants declare that the graphic design of the game is good and 36% as very good. Here, 19% of the participants rate the graphic design as poor or very poor. This is due to the fact that the implementation tool (OpenSim) does not offer high quality graphics like those students see in computer games. However, for educational purposes very high quality graphics may be distracting for educational purposes.



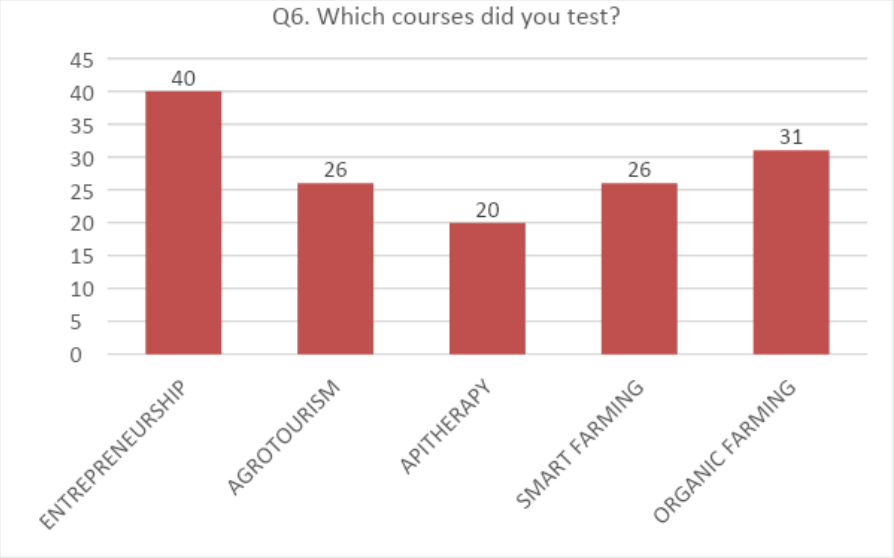
Q5. Did the game progress smoothly?

77% of the participants declare that the game progresses smoothly. Again, most of those that do not agree were from Romania pilot event.



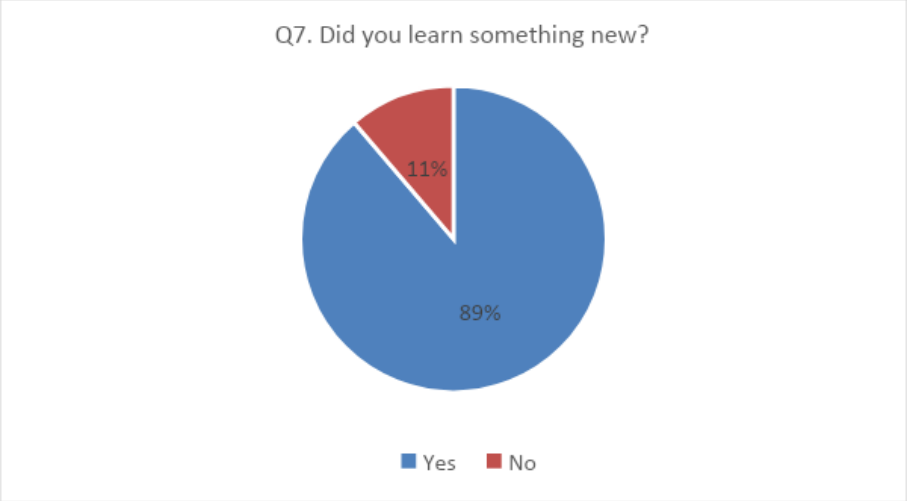
Q6. Which courses did you test?

All five courses were tested by the participants. The introductory course (Entrepreneurship) was tested more than the rest of the courses, as expected. Apitherapy was the least tested, while Agrotourism and Organic farming were tested by an equal number of participants. According to the results, each participant dealt with 2 courses on average.



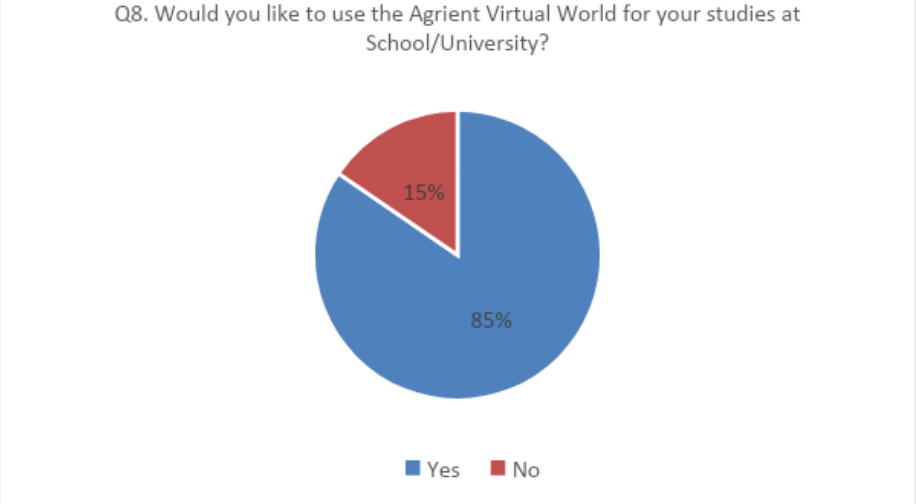
Q7. Did you learn something new?

Majority of the participants (89%) learned something new. Again, most of those that do not agree were from Romania pilot event.



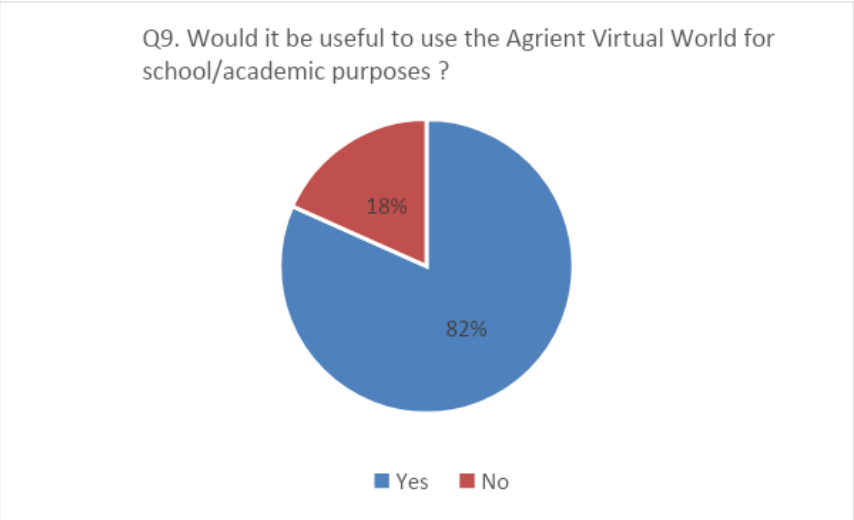
Q8. Would you like to use the Agrient Virtual World for your studies at School/University?

Also, the majority (85%) would like to use the Agrient Virtual World for their studies at their school/university, which is a very encouraging result.



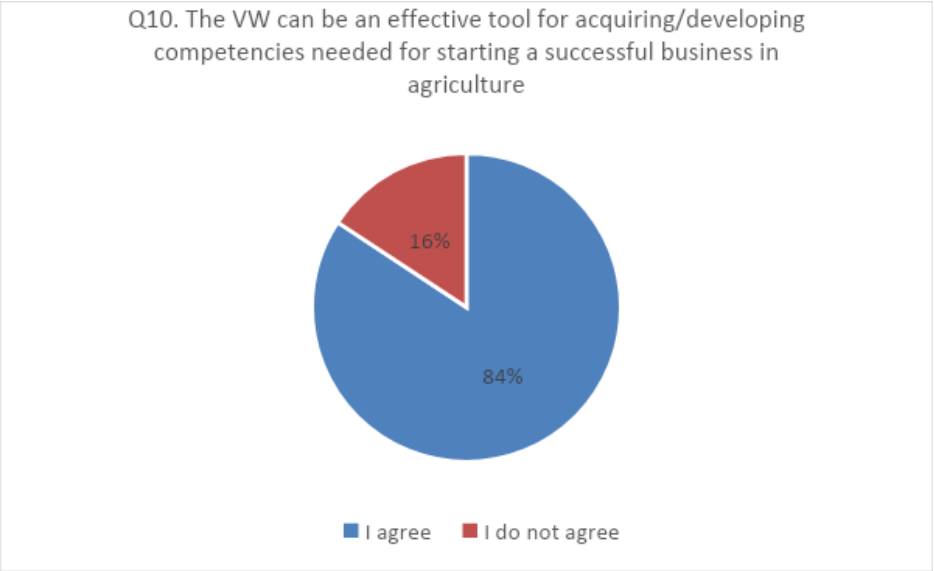
Q9. Would it be useful to use the Agrient Virtual World for school/academic purposes ?

Again, the majority of the users (82%) found it useful for academic purposes and agree that the content complies with the local strategies of development.



Q10. The VW can be an effective tool for acquiring/developing competencies needed for starting a successful business in agriculture

It is again very important that the majority (84%) agree that the VW can be an effective tool for acquiring/developing competencies needed for starting a successful business in agriculture.



Q11. What is the greatest strength of the VW?

Use of graphics for learning, real life simulations, interactivity, ease of use, free navigation (flying everywhere), learning by playing and entertaining flavour were the most important replies to this question.

Q12. What is the greatest weakness of the game?

Quality of graphics, server problems, missing capability of users to create something, little guidance at some places and much theory at some places were the most important replies to this question

Q13. Your support counts! What would you change/improve in the VW ?

Better graphics, more activities and quizzes at some places, more interactivity at some places, bigger letters at some messages and capability for voice based communication among users as well as introduction of voice-based presentations and music were the most important suggestions of the users.

2.2. VET/HEI representatives questionnaire

Tutors of VET Schools and HEIs were called to try the AGRIENT 3D VW educational platfrom and complete a questionnaire of 14 questions with concrete answers and 3 open questions. In Table 3, we present the number of participants in the piloting activities.

Table 3

Country	Number of evaluations
Croatia	4
Cyprus	3
Greece	7
Slovakia*	1

Grand Total	15

Q1, Q2, Q3, Q5.

They are the same questions as those for learners, but the results are better (as expected). The VET/HEI participants consider that the explanations about the project (Q1) are clear (20%) to very clear (80%) and the explanations about the rules of the 3D VW (Q2) are clear (33%) to very clear (67%). None considered them poor or very poor. The results are even better for the ease of use of the 3D VW (Q3): 93% agree that it is easy to use. Finally, 100% consider that the game progresses smoothly (Q5).

Q4. Are there any prerequisites (prior knowledge) needed to use the game?

67% of the participants agree that no prior knowledge is needed to use the game. The rest consider different kinds of required knowledge (software setup, familiarity with games, an introduction about pedagogics etc).

Q6. Is this a tool you see playing in the classroom of your VET/HE institution?

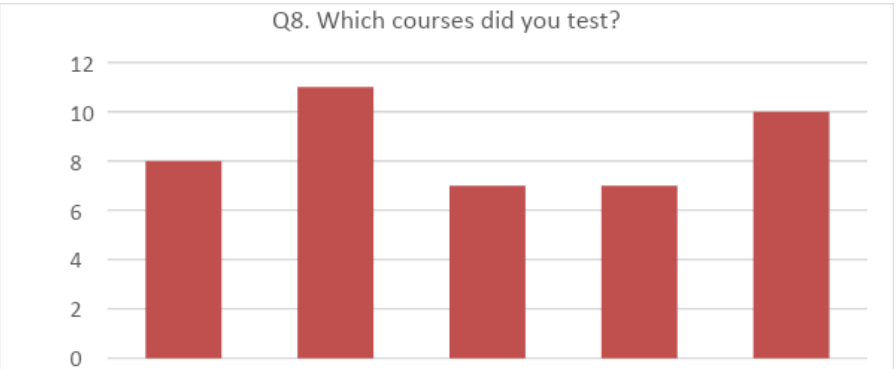
It is similar to the Q8 of learners' questionnaire. Here, 100% of the participants consider the tool suitable for use in the classroom.

Q7. Please describe the main playful and educational features of the game

This is an open question. The participants mentioned various features, like: 3D navigation, visualization, simulation, quizzes, learning levels, user interaction, feedback, repetition, asynchronous learning.

Q8. Which courses did you test?

The same as Q6 for learners. However, now Agrotourism and Organic Farming were the most tried courses (see below figure).



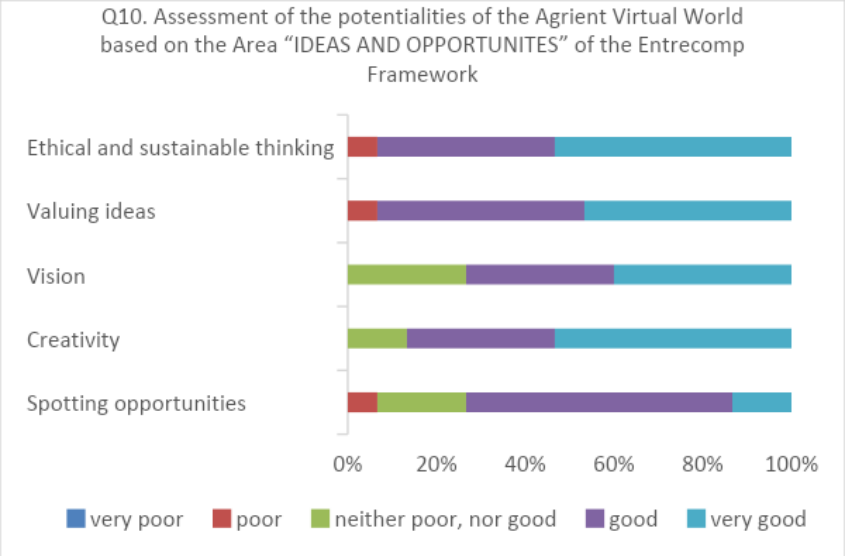
Q9. The courses cover EQF level from 3 to 6

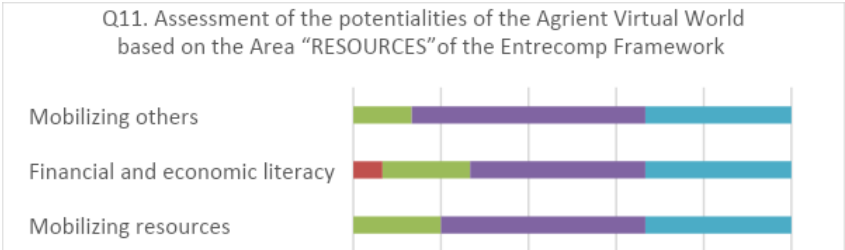
This is an important question that relates to the EQF levels covered by the educational output of our project. 87% of the evaluators replied 'Yes'. From those who voted 'No', someone suggested it be completed with skill-based activities and evaluation.

The next three questions concern evaluation of the 3D VW AGRIENT platform based on the competences of the three areas defined by the "**EntreComp**" (European Entrepreneurship Competence Framework), a reference framework that describse what it means to be entrepreneurial (https://ec.europa.eu/social/main.jsp?catId=1317&langId=en).

Q10/Q11/Q12. Assessment of the potentialities of the Agrient Virtual World based on the Areas IDEAS AND OPPORTUNITIES/RESOURCES/INTO ACTION of the EntreComp Framework

The results show that our product at large degree complies with the competencies of all three areas (see graphs below). In the horizontal axe the percentages refer to the number of participants



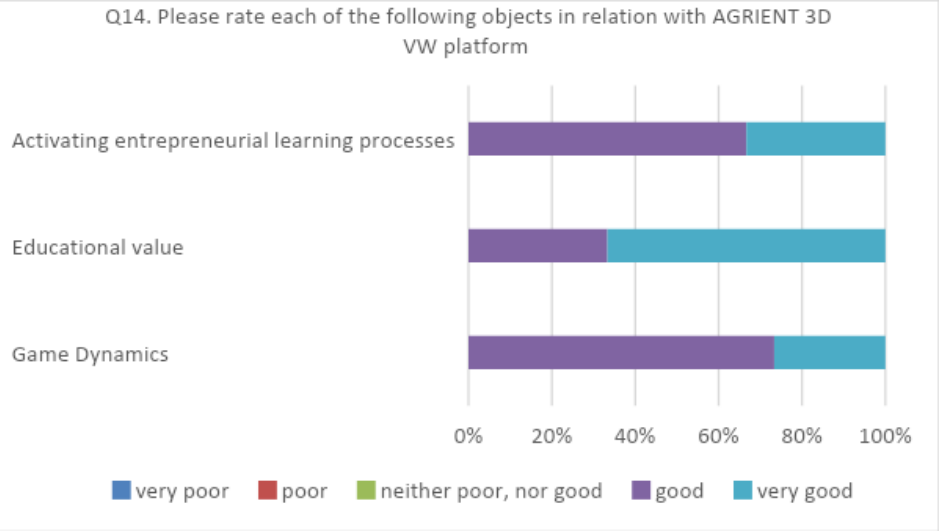


Q13. The VW can be an effective tool for acquiring/developing competencies needed for starting a successful business in agriculture

100% of the participants agreed that the 3D VW educational tool can be effective for developing competencies for entrepreneurship actions.

Q14. Please rate each of the following objects in relation with AGRIENT 3D VW platform

This question refers to the "game dynamics", "educational value" and "Activating entrepreneurial learning processes" features of the project product. The results show that it has those features at a large to very large degree (see graph below).



Q15, Q16, Q17.

These questions are the same as Q11, Q12 and Q13 for learners and the results are really very similar to those.

2.3. Policy makers questionnaire

Policy makers (e.g. ministry of education consultants, heads of university departments, officials of ministry of agriculture) were called to try the AGRIENT 3D VW educational platform and complete a questionnaire of four open questions. In Table 4, we present the number of participants in this questionnaire.

Table 4

Country	Number of evaluations
Croatia	3
Cyprus	4
Greece	4
Slovakia*	2
Grand Total	**13**

Q1. To what extent does the Agrient Virtual World platform and its content address the business capabilities of the target group (end-user needs)?

The answers stated that the platform addresses from an adequate to a large degree the needs of end users. There was no answer stating that it is not adequate.

Q2. How could you use the Agrient Virtual World platform in your environment and what do you think would be its main benefits and barriers to educational practice? (External stakeholder interests, benefits, utility, efficiency, relevance, cost / effectiveness ratio, sustainability)

The participants stated that the platform could be certainly used in the education of new farmers in agriculture at least as an introductory course in a distance learning mode. Also, it could be used as part of a classroom educational program. Furthermore, it could be used for seminars in the field.

The gamification flavor of the platform would be an attractive feature for young farmers to study about agriculture business topics.

A difficulty that may arise is the acceptance of new teaching/learning technology by the farmers, especially the older ones.

A quotation from an answer: "The Department of Agriculture is preparing an e-learning platform for farmers for their asynchronous education. The Agrient platform may be part of it or in parallel use."

Q3. What ideas, approaches, tools of the Agrient Virtual World, do you think are worth adapting to relevant (local) strategies and practices and why? (Impact on strategic planning)

We copy some of the answers.

"Deli's office, John with smart agriculture and Alan with UAVs and sustainable agriculture, are tools that if adapted to local strategies will deliver high quality results to users of the application but also in real application conditions."

"Agribusiness, agritourism, organic farming and smart farming practices as well as the issue of bee therapy presented through the 3D Agrient world are excellent examples especially for Cyprus."

"All the tools of the virtual environment are worthwhile and interesting and worth adapting to local strategies and practices."

"The whole idea of education through the virtual world and the game seems interesting."

Q4. What would you improve on Agrient Virtual World's online learning platform (technical issues, features, content) and how? (Weaknesses, barriers, inconsistencies, gaps, quality, clarity, approach, tools, etc.)

Some answers or parts of answers:

"I would place more emphasis on assessment and self-assessment exercises."

"I would suggest targeted response or browsing with emphasis on interaction and active user involvement in specific areas or tools of the program rather than serial or predefined tour."

"Better graphics quality and use of sound/voice"

"To provide the possibility of interruption and continuation, at any stage of monitoring."

"The movement with the tractor must have the option of pausing or changing the rhythm in order for the user to be able to read the text."