Project No.: 2017-1-DE02-KA202-004274

NATIONAL REPORT Country Cyprus

Intellectual Output 1:
Benchmarck Survey On Integrating Digital, Coding And Robotics Skills In Vet Schools: From Theory To Practice

February 2017

Partner Organisations Emphasys (P3), CCS (P6)

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Content

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1. Introduction

ROBOVET4ALL aims to promote the acquisition and achievement of skills and competences, such as basic, soft, digital and language skills through effective and innovative teaching and assessment. To promote social inclusion through innovative integrated approaches -inclusion, diversity, equality, gender-balance and non-discrimination in VET also combating discrimination, segregation, racism, bullying and violence. To enhance the access, participation and learning performance of disadvantaged learners, reducing disparities in learning outcomes.To further strengthen key competences in VET, including common methodologies for introducing those competences in curricula, as well as for acquiring, delivering and assessing the learning outcomes of those curricula.Introducing systematic approaches to, and opportunities for, the continuous professional development of VET teachers by developing effective open and innovative education through the use of ICT. Developing VET business partnerships aimed at promoting work-based learning in all its forms, by involving social partners, companies and VET providers. To strengthen the profile(s) of the teaching professions, including teachers, school leaders and teacher educators, through supporting teachers in adopting collaborative and innovative practices and in dealing with diversity in the classroom through the development of a targeted. To promote open and innovative methods and pedagogies, participatory governance where appropriate, develop learning materials and tools as well as actions that support the effective use of ICTs in VET. To promote recognition as well as transparency and comparability of learning outcomes ant to promote innovative solutions for the recognition and supporting the validation. To promote recognition as well as transparency and comparability of learning outcomes ant to promote innovative solutions for the recognition and supporting the validation.

Importance of the project in Cyprus - Connection between national situation and EU-level regarding to the topic of the project (mobility of workers, need for european standards):

The Digital Economy and Society Index 2016 (DESI) has ranked Cyprus at one of the lowest positions according to the DESI (European Commission, Digital Single Market, 2016) average set by the European Union. Most Cypriots are regular Internet users but a significant percentage (26%) has never used the web. This means that “one-fourth of the population cannot partake on the possibilities offered by the Internet”. Therefore, Cyprus needs to address this critical issue, since inadequate digital skills “limit the gains for citizens for engaging in a wide range of online activities”. It is alarming the fact that only 43% of Cypriots possess basic digital skills and the lowest percentage of ICT specialists (2.4%) in the workforce. The lack of ICT specialists placed formal education in the spotlight for offering effective solutions to the challenges faced by each Member State.

Purpose of IO1: The purpose of IO1 is the developemnt and utilization of a survey in order to analyze and document the current scene of digital, coding and robotics skills in vet schools and also the demand for enhancing and improving on set skills.

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2. VET-Education of ICT and Robotics in Cyprus

2.1 Political and educational framework

Since 2005 the Republic of Cyprus has initiated an ambitious Educational Reform Programme with a view to turning the vision of a better and more modern educational system that will meet the needs and challenges of the 21st century and turn them into reality. ICT has been promoted greatly in public schools through the use of European funding.

The Ministry of Education and Culture has been implementing in the last 5 years an ICT integration plan (Ministry of Education and Culture Cyprus). The aim of this program is to effectively use Information and Communication Technologies (ICTs) in the educational process and to enhance the digital literacy of students and teachers. The core objectives of this program include:

- Providing schools with advanced ICT infra-structure and equipment
- Improving the teaching and learning aids, while exploiting the affordances of ICT, in accordance with the current curricula reform and pedagogical methods. For this purpose the MoEC has initiated two strategic projects: a) the e-Content and educational software acquisition and b) the creation of the Schoolnet DIA.S. (educational portal and LMS).
- Training teachers in order for them to acquire the skills for using ICT tools in the educational process and to keep up with the current tech-nological developments (see section 5).

As part of the Education Reform Programme the National Curriculum of all subjects as well as the timetable of all sectors of education (primary, secondary and VET) have been revised and new aspects have been introduced to meet the needs of the society. This in effect influenced the Curriculum of ICT.

In Cyprus, ICT course is introduced at the first class of Gymnasium, where the basic concepts of ICT is introduced, to help students (assuming that there are students with no or little knowledge on ICT) get familiarised them self with the concept.

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During the first three years of secondary education (Gymnasium), students are obliged to attend the ICT course, for two hours per week. In particular, during the first year, students learn the basic computer operations and the importance of computers in the work environment. Moreover, they learn the hardware of computers and they are introduced to files, folders and Microsoft Word, as the basic word processor/editor software. In addition, basic definitions about networks and internet are introduced in order to help the students realize how computers have changed our lives the past decades (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

In the second year, students learn about the binary system and the computer’s architecture, such as the central processing unit (CPU) and memory. Furthermore, the students learn about number processing and presentation software applications, like Microsoft Excel and Microsoft Power Point respectively. At this stage, students are introduced to the concept of algorithms (pseudocode/logic diagram). This is an important introduction to coding, and it is meant to incorporate the students to the world of programming (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

During the third year of secondary school, students are involved more into programming, while they make their first attempt to ‘convert’ the logic diagrams into simple programs, with the use of the Scratch programming language. This year it is considered as a stepping stone to a more advanced world of programming. Regarding to the software applications, students learn how to use database management systems such as Access (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

As part of the Educational Reform Programme the structure of the secondary education in relation to the Lyceum, is being introduced during the current year. For the first year of lyceum, the ICT course is mandatory and is taught twice a week for an hour (Ministry of Education and Culture, “Νέα Ωρολόγια Προγρμάμματα”). Students are more prepared to deal with programming and various concepts such as variables, constraints, data types; and functions are now familiar. Students use the Pascal programming language, which is highly preferred by many schools and institutions because it is known as an efficient language intended to encourage good programming practices and data structuring. In addition, they are taught about conditional expressions and logical operators which are incorporated in

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logic diagrams. Video, sound and image editing are some of the features which are introduced within this academic year (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

It is worth mentioning that according to the curriculum for the 2nd and 3rd year students, there are 8 mandatory courses. ICT course is not one of them. Hence, the students have to choose their preference courses which are taught more hours per week. ICT course is chosen by students who wish to study exact sciences (mathematics, physics, chemistry, biology, medicine, computing, etc.), engineering and economics/finance. The course is nationwide examined at the final year (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

Based on the old curriculum, students who have chosen the ICT course are taught programming using the Pascal programming language. Following the old curriculum for the ICT course the students learn about the concept of the system analysis cycle, in order to give a clear idea of the theoretical framework concerning software engineering. Moreover, students practice with more advanced algorithms and logic diagrams while conditional expressions, loops and matrices are involved. During the final year, they are able to define data types, incorporate several functions, and use mathematical and logical expressions in combination with logic gates diagrams, arrays (one/two dimensional) and include simple or complex conditional expressions in their code. Last but not least, the analytic syllabus includes design of simple user interface, debugging and evaluation of a program (Ministry of Education and Culture, “Αναλυτικό Πρόγραμμα: Πληροφορική”).

Most teachers prefer to introduce all the above concepts during the second year of lyceum in order to emphasize on more practical possibilities during the 3rd year in order to prepare the students for the final year examination and essentially to help them achieve a position at a University or College.

It is expected that the C++ language will be used as the new programming language environment according to the new reformed curriculum (Ministry of Education and Culture).

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2.2 Needs of the Labour Market in the Sector of ICT and Robotics

The survey conducted by the Cyprus Productivity Centre under the title: "*Evaluation Survey for the Gap of the Professional Information and Communication Technology Practitioners-2015*". The research analyzes the supply and demand in the ICT sector in Cyprus and the possible existence of digital skills gap of graduates of tertiary-level university ICT graduates and the needs of the labour market.

Based on the findings of the survey regarding the gap between the IT Professionals and the demands of the workforce raised the issue that IT graduates do not have all the necessary skill set required by companies. Employers state that graduates are only partially ready to enter the workforce since they are having difficulties in finding solutions for problems related to the company, or communicate efficiently. The latest trend followed by companies is the demand of specific professional certificates additional to the University degree (Grow Digital, Cyprus). Most companies value all additional certificates and take them in to consideration when a candidate is interviewed for a position.

It is obvious that the range of professional skills required by companies is not covered efficiently by Higher Academic Institutions, however the root of the problem can be found at the early school years of a student. It is highly considered here that the lack of ICT skills of the trainers do not allow them to efficiently inspire students to pursue a career in IT professions, therefore students who are more career oriented follow professions like doctors and lawyers, splaying this way the gap between IT professionals and the workforce.

The Action Plan was also based on the findings of the *Digital Economy and Social Index (DESI 2016)*. According to DESI Cyprus has an overall score 3 of 0.42 and ranks 23rd out of the 28 EU Member States. Fast broadband connections are available to 84% of households (against 71% in the EU) but internet take-up is relatively low. Only 69% of households subscribe to fixed broadband, potentially limiting Cyprus' ability to exploit the benefits of the digital economy. Cyprus lags behind on the demand side: 26% of the population has never used the Internet and only 43% possess at least basic levels of

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digital skills. Although Cypriots engage in a broad range of online activities, their use of online banking (29%) and online shopping (32%) are much lower than the EU average. Low levels of trust seem to be holding back the development of its digital economy. Cyprus' score was lower than the EU average and over the last year, the score grew at a slower pace than the EU. As such, Cyprus is part of the falling behind 4 cluster of countries.

Based on the above, the National Alliance proceeded to an initial mapping of all actions taken by the public and private sector (ministries, employers, universities, companies, ICT enterprises etc.), in order to design the National Action Plan of the Grand Coalition for Digital Jobs of Cyprus., according to three main pillars and priorities: (a) Education and Training, (b) Certification and (c) Awareness building

Five are the main objectives under the section Education and Training:

1. Strengthening ICT in education.
2. Identify the skills of professionals in the field of Information Technology and Communications in accordance with market requirements.
3. Creating more flexible digital skills education systems adapted to European standards.
4. Offer training programs to unemployed, professionals and vulnerable groups.
5. Improving educational programs and vocational training programs.

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3. Empirical Research

3.1 Sampling and Method

Two different version of questionnaires were desigbned. One version is aimed towards teachers and the other one towards students. The aim ofthe questionnaires is to establish the level of knowledge and skilsl that students and teachers have in relation to coding and robotics. In order to develop suitable learning material for both target groups we first need to identify the gaps and weakneesse of the exstisting curriculum. Having identified the issues we can then proceed with the developemnt of a syllubus which will enhance, improve and provide additional and essential skills for both students and teachers.

Participants

The results presented in this report are based on the feedback from 10 students and 10 teachers of various schools and disciplines.

3.2 Results

Presentation of results, possibly including graphs or figures

Level of Confidence/experience in specific subjects

Following is a chart presenting the the lovel of confidence of the teachers participating in the survey regarding a series of subject.

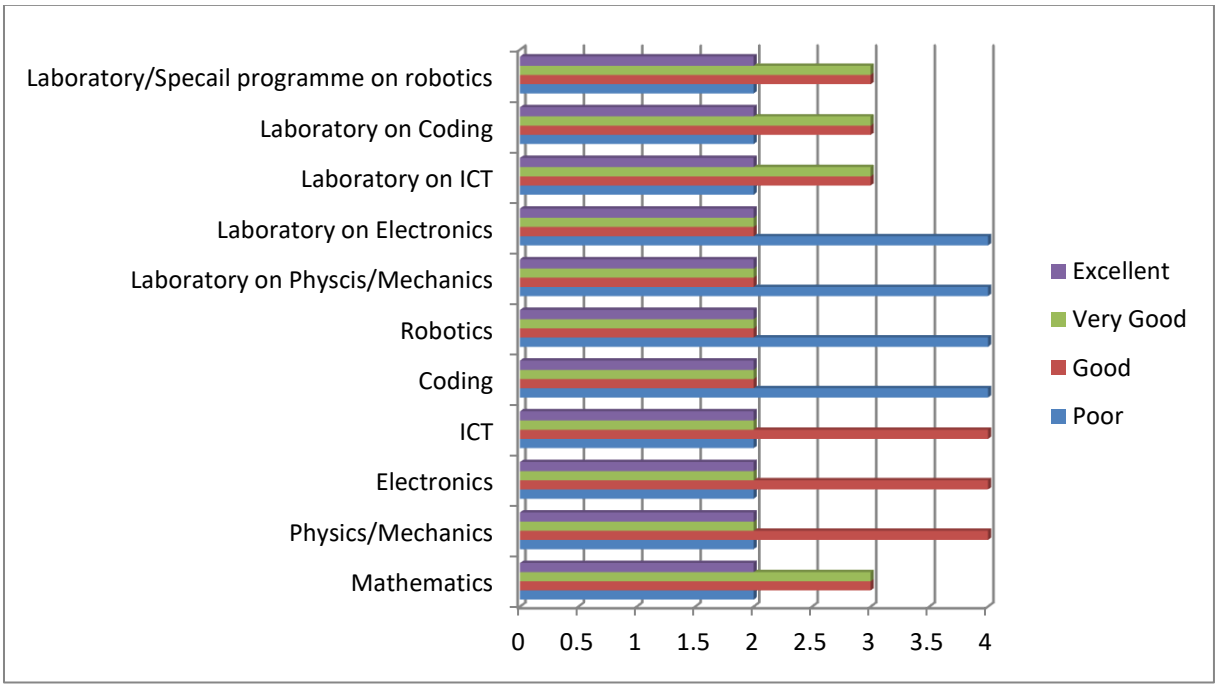

Chart 1: Level of Confidence/Experience of the teachers

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Following is a chart presenting the the lovel of confidence of the students participating in the survey regarding a series of subject.

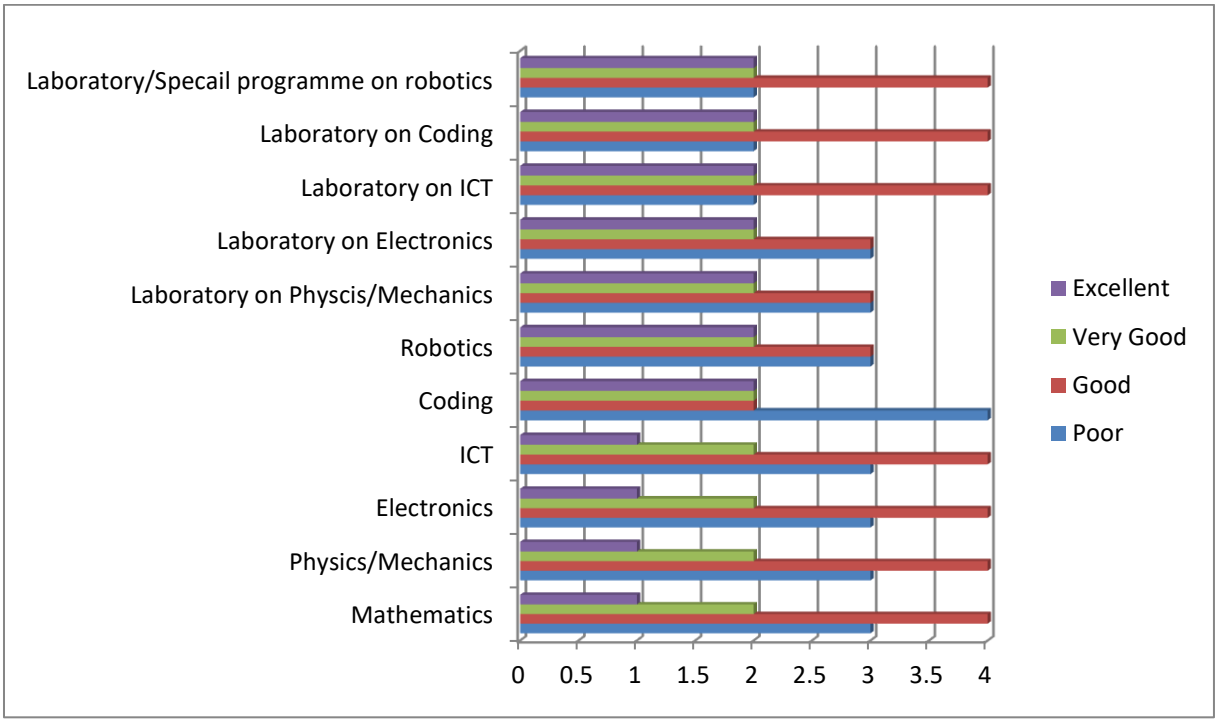

Chart 2: Level of Confidence/Experience of the students

School Facilities

Schools have the very basic facilties for general enginnering but lack specialised equipment such as Robotic Kits and Robotic programming software.

Robotics taught through the curriculum

Unfortunately the current curriculum does not provide specific robotic training opportunities. Anyone interested on the subject has to the spent their own time and resources in order to gain knowledge and skills on robotics.

Exisitng training opportunities

The questionnaire resutls have shown that teachers not invloved in the disciplines of Computer Science and Physics have not received any kind of trainign in coding and/or robotic skills.

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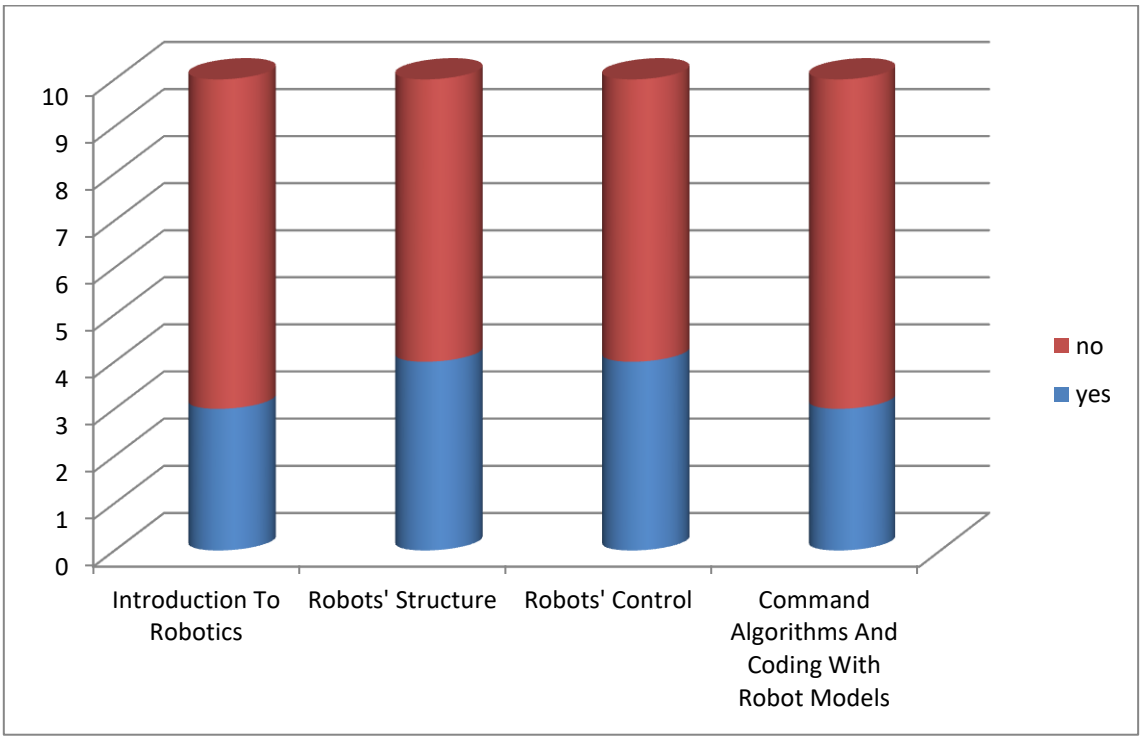

Chart 3: Teacher Chart

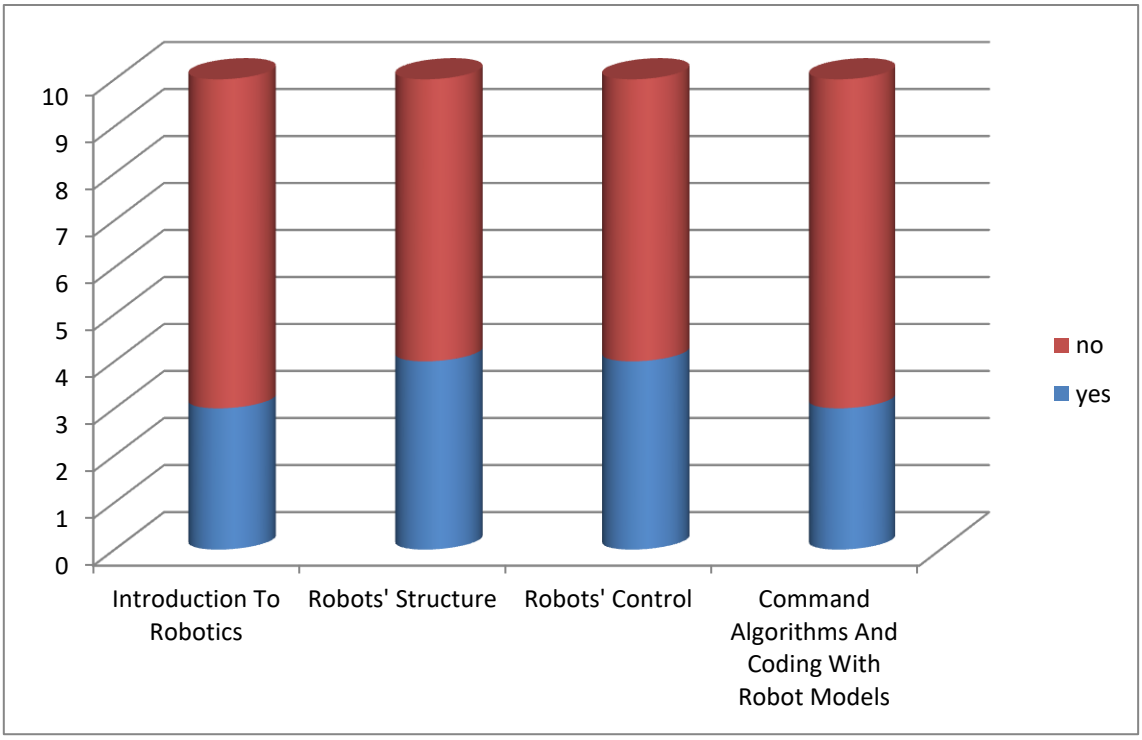

Chart 4: Student Chart

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DemandTrainnig of coding and Robotic Skiils

The last section of the questionnaire was asking for the survees to quantify how keen they are on learning the various topics of coding and robotics.

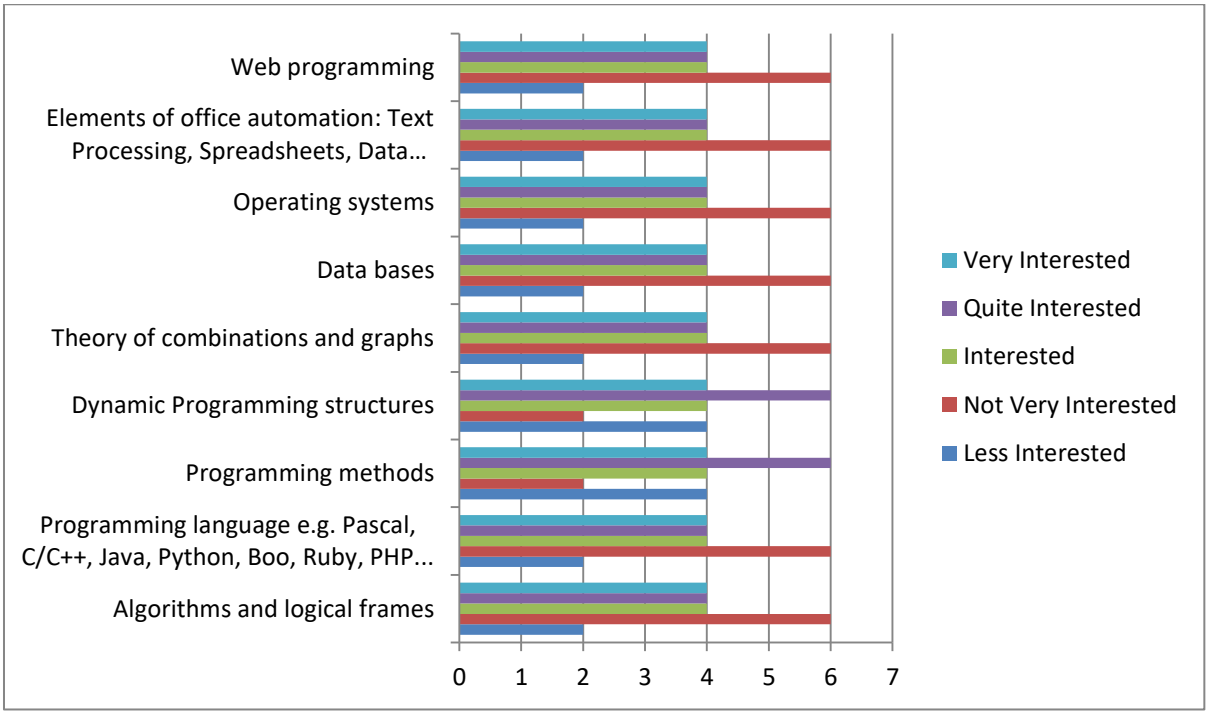

Chart 5: Teacher and Student Chart regarding the deamnd for coding skill acquisition

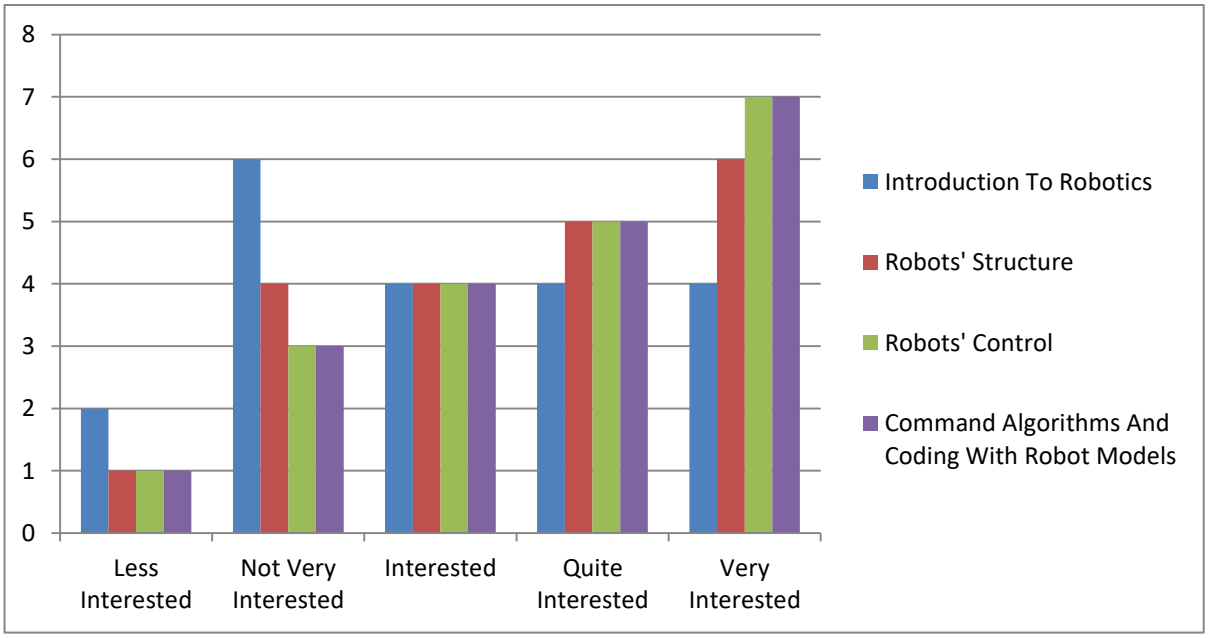

Chart 6: Teacher and Student Chart regarding the deamnd for robotic skill acquisition

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4. Conclusion

It is clear that even though that the labour of Cyprus demands and requires people to have a certain level of ICT skills, a large percentage of the population fails to acquire them.

The school cirriculum does not provide any opportuniteis for acquisition of knowledge and skill regardign robotics. Intrested parties have to spent their own time and resources outside the school.

We were happy to note that the resutls have shown that a large amount of the people particiapting in our survey, have shown a large interest in programming and robotics. This is a very important finding for the project, as this will allows us to create a steady target group willing ot particiapte in the future project phases.

We have observed that even though there is a high demand for digital skill acquisition both form the labour market as well as form the surveyed population, there exeists a gap from an educational standpoint which does not promote this kind of training.

Similarly, even though programming and robotics are an excellent path way for the promotion of STEM skills, interested groups should proceed on their own and search for other venues than the offered curriculum, in order to fullfill their educational needs.

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