KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education

Call for Proposals 2019 - EAC/A03/2018

Teacher training with specialization on life and information technology skills/21stTS

21st century skills teaching state-of-the-art report

University of Ioannina, Greece

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LIST OF ABBREVIATIONS

UOI: University of Ioannina, Greece
NGS: Novel Group Sarl (Novel Group), Luxembourg
KU: Klaipėda University, Lithuania
SIU: Symbiosis International (Deemed University), India
BV: Banasthall Vidyapith, India
SWU: Southwest University, China
SZPT: Shenzhen Polytechnic, China
RUPP: Royal University of Phnom Penh, Cambodia
UBB: University of Battambang, Cambodia

EU: European Union
OECD: Organization for Economic Co-operation and Development
PBL: project based learning

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EXECUTIVE SUMMARY

This document is the third Intellectual Output of the WP1 of the project 21stTS: Teacher training with specialization on life and information technology skills. The main objective of 21stTS project is to develop a new education programme in higher education institutions' curricula for teachers and educators. More specifically, the project aims to improve the quality of higher education and life-long learning, enhance the relevance of education for the labour market and society, improve the level of competences and skills in the HEIs, enhance the innovation capacities as well as the internationalization of HEIs, promote voluntary convergence with EU developments of curriculum development in the field of education studies in and finally, promote people-to-people contacts, intercultural awareness and understanding.

Intellectual Output 3: The 21st century skills teaching state-of-the-art report is a document which is based on intellectual outputs 1 and 2 of the project, that is Report on 21st century skills Educational Programme Content and Report on capacity-building for 21st century university teachers and best practices. Research results from both reports will provide a basis to develop a roadmap of the development of the educational programme and the capacity-building training for the academic staff. In this sense, it will contribute to the 21st century skills educational programme content which will target teachers and educators who will need to adapt their methodology and content and integrate 21st century skills in their teaching. Furthermore, the roadmap provides analytical steps on how to develop courses that have integrated the Technological Pedagogical Content Knowledge (TPCK), respect the needs and differences of each Partner Country as well as clear guidelines on how to integrate development of the skills within existing and subject-based curricula. Following the collection of information, Each HEI organized a focus group of 12-15 experts who supported the process and gave recommendations on the courses content.

In the sections that follow, UOI, leader partner of the development of the third output of the 21stTS project, presents a summing up of the key-findings of the previous intellectual outputs, provides a consolidated analysis of the findings of the two reports and finally includes a series of best practices on how to teach 21st century skill and how to assess them. In this sense, the report offers specific recommendations to be integrated in the development of the Curricula and the Capacity Building Training Content. In the next work packages, an e-toolbox will be developed which will include best practices and assessment tools.

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1 INTRODUCTION

1.1 PROJECT OBJECTIVE

The rapid emergence of digital technology, robotics, nanotechnology, artificial intelligence on the one hand, and the striving of education to prepare learners with cross-disciplinary knowledge, life skills and abilities for living in and protecting the globalized world of the 21st century on the other, have raised concerns about the identity of future citizens. STEAM Education has become a powerful tool towards this direction as it supports the development of skills of Science, Technology, Engineering, Arts and Mathematics, all of which invest on the development of the future citizens. (Plakitsi et al, 2018; European Commission [EC], 2012; Next Generation Science Standards, 2013; Organisation for Economic Co-operation and Development [OECD], 2015). At the same time, the Lifelong Learning Policy Agenda in the European Union (http://ec.europa.eu/education/policy/adult-learning_en) has stressed the importance on lifelong learning connected with formal, non- formal and informal education at all levels of school education, university studies as well as adult learning. Lifelong learning has become a vital component of educational curricula that aim to personal development, social inclusion, employability of future citizens in a competitive globe and active citizenship towards a sustainable future. In this accelerating pace of change in economy and technology that has had an impact on education in the 21st century educational curricula, there is a strong need to develop student-centred learning environments that cover successfully the needs of a growing diverse population of learners with a variety of multi-cultural, multilinguistic and multi-ability needs. Furthermore, there is a need to respond to the gap in skills set in the labour market and society, shortage of qualified teachers and poor level of student learning.

Within this frame, the project aims at transferring knowledge, best practices and experience on innovative and ICT-based teaching methodology on 21st skills acquisition from HEIs in Programme Countries to the HEIs of Partner Countries that will be benefitted directly from this project. Old and new teachers will become agents for embedding 21st century knowledge and skills in all subjects in accordance with national and state standards. Additionally, academics, tutors and lecturers will have the opportunity to receive a high-quality capacity building programme which aims to align technologies with content and pedagogy whereas it includes training on assessment tools for skills evaluation of the students. Thus, target groups of the project, such as students, educators and teachers, (primary, secondary, vocational, adult, special needs), language teacher trainers, academic staff, careers officers etc. will have direct benefit from the implementation of the project at all levels.

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1.2 THE 21TS CENTURY SKILLS

According to the project, the 21st century curriculum should cover four broad areas, namely:

1. Life and career skills such as flexibility and adaptability, self-initiative and self-direction, time management and goals, independence, team work, intercultural skills, and leadership skills.

2. Learning and innovative skills such as; creativity, critical thinking, innovative thinking, problem solving, communication and collaboration.

3. Integration of global awareness, financial, economic, business and entrepreneurial literacy, and civic, health and environmental literacy within the academic content of core subjects.

4. Information and media technology skills with a focus on accessing information efficiently and effectively, evaluating it critically and competently, and using the information accessed accurately and creatively to solve problems.

These skills offer a collective vision for learning in the 21st century framework, which is connected to the needs of learning communities considering life and career/professional development, learning and innovation in education, global awareness and different types of literacy that lead to responsible citizenship, information and media technology skills to achieve in dealing with problem solving situations in personal and professional life, education and citizenship. Partners of the project conducted an exhaustive needs analysis on the lack, the specific needs as well as the applied best practices on teaching 21st century skills. More specifically, partners from Cambodia, India and China conducted an exhaustive needs analysis on the lack of 21st century skills and qualifications of teachers and educators in elementary and secondary schools as well as on the needs of the Asian academic staff on 21st century skills so as to identify which needs on innovative teaching methodologies, student assessment and ICT-based skills are needed in the classroom. Partners from Lithuania, Luxembourg and Greece conducted research in order to detect the applied best practices on teaching 21st century skills. Analysis of the data will contribute to the 21st century skills educational programme content which will target teachers and educators who will need to adapt their methodology and content and integrate 21st century skills in their teaching.

Following the collection of information, the partners drafted their Country Reports, upon which this document is based. Hereinafter the present report presents a summary of the key-findings from the national desk research conducted by each partner, along with a compilation of the data collected and further analysis for each country. More information on specific issues related to national specific information can be obtained from the Country Reports in the Need Analysis Report.

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In the sections that follow, UOI, leader partner of the development of the State-of-the-art report of 21stTS project, provides a consolidated analysis of the findings connected with both the Report on 21st century skills Educational Programme Content and the Report on capacity-building for 21st century university teachers and best practices, the contribution of the feedback from focus group of 12-15 experts of the partner countries. Furthermore, UOI provides a definition of content themes focusing on teaching critical thinking, collaborative problem-solving and education-technology skills as well as optimizing assessment for 21stcentury Skills a roadmap for adaptation of the course as well as specific recommendations to be integrated in the development of the Curricula and the Capacity Building Training Content.

The needs analysis research for academics, teachers/educators and students was carried out between February 2020 and May 2020 by all partners, and the country reports were produced. This part took longer than expected due to the lockdown of all schools and institutions at different parts of the world after the coronavirus pandemic outbreak.

Before this period, the coordinator partner, UOI, designed the research framework and the template for the report, along with the three questionnaires mentioned above. After receiving feedback from all partners, the templates and questionnaires were finalized and the partners began to work on research, as indicated above. All partners undertook the responsibility of carrying out the research in their own country. Collaborating Universities used a convenience sampling method for both of the above population clusters and did not apply any exclusion criteria.

2 NEEDS ANALYSIS FINDINGS

2.1 THE 21TS CENTURY SKILLS IN THE CURRICULA

The desk research carried out in the five countries (eight Higher Education Institutions) of the partnership has provided very useful results for the development of the 21st century teaching skills through this project concerning academics, teachers/educators and students. More specifically, the Higher Education Institutions investigated in their countries (Lithuania, Greece, India, China and Cambodia) provide evidence about the development of the 21st century skills, the official documents that support them, the impact of these on the teacher training programmes as well as the inclusion of the skills in the university curricula.

The analysis of the **academic results** shows that the 21st century skills are defined, discussed, documented and integrated into the inclusive education process in European countries (Greece, Lithuania) and in China. In Cambodia, many educational documents mention 21st century skills and points to the importance of educating them at various

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levels of education, but usually these skills are not defined in exactly the same way as in Europe. Whereas, in India, analysis of data has shown that these skills receive very little national attention. Almost in all countries, there are discussions about the introduction of regulations or guidelines on the teaching and evaluation of the 21st century skills but without specific guidelines for their implementation. It seems that the skills are taught across subjects and are included in the different areas of the curricula but not as a separate subject following specific methods. On the contrary, the 21st century skills are addressed, as a topic which can also be viewed in the framework of specific disciplines.

Recommendations for the teaching of the 21st century skills come from the Ministry of Education or the National Curricula as references but without specific guidelines at the implementation level. Changes in the curricula of European countries, including the necessary skills for learners of all ages, are driven by EU documents and educational documents of Royal Government of Cambodia. These documents are guidelines for advanced, time-responsive education. Both in schools and in universities, especially in the teachers training ones. Meanwhile, in India, where there are no general guidelines for country education, the impact of official documents/guidelines/regulation on teacher training programmes cannot be discussed. The official documents in China that include the 21st skills development as well as guidelines for implementation are the National Curricula. More specifically, the research of Lithuanian, Greek, Cambodian, and Indian academic staff showed that the universities' curriculum in these countries more or less covers all the 21st century teaching skills. In China the 21st skills are mostly taught across subjects and are included in the different areas of the curricula but not as a separate subject. We can also observe little attention for the development of economic skills in China. Meanwhile, an Indian study has revealed that there is no focus on 21st century skills development in this country. As far as the assessment methods are concerned, European countries' (Greece, Lithuania) and Cambodia provide an assessment framework, with a divergence in the assessment methods. In China and India, that there are no specific guidelines or regulations about the teaching or assessing the 21st century skills of students and they don't use any specific methods. Following the results, we can see that European countries' (Greece, Lithuania) and Cambodian universities teachers provide plenty of students' skills development and assessment methods. Their frequency of application is various, but it is sufficient and appropriate, as it requires for 21st century skills development. Chinese research data shows, that there are no specific guidelines or regulations about the teaching or assessing the 21st century skills of students and they don't use any specific methods. The quantity of Indian students' skills development and assessment methods indicates a lack of appropriate methods and it could be changed to prepare students for a life in 21st century.

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The analysis of the **teachers' results** showed that Team Work was the overall most covered skill in the educational curricula of China, India and Cambodia, followed by Communication and Problem Solving. Less taught skills are Business Literacy, Entrepreneurial Literacy and Economic Literacy. It is important to notice that some skills that are prominence in one country may have not a decent coverage in overall examination. For example, Critical Thinking seems to be a skill well covered in Cambodian Education Curricula whereas in Chinese Education Curricula it seems to be a skill less covered, resulting to a weaker representation of Critical Thinking in the skills covered by Education Curricula Overall. Examining the skills covered by education curricula for each country individually we can see that the skills covered by Cambodian Education Curricula are firstly Team Work, which is the skill most covered in Cambodian Education Curricula. Moreover, Adaptability, Problem Solving and Critical Thinking are skills well covered and included in education Curricula. On the other hand, Business Literacy and Entrepreneurial Literacy are skills less covered by the Cambodian Curricula. The skills covered by Indian Education Curricula are Creativity, which is most found in education curricula, Economic Literacy and Business Literacy. One should mention that Technology Skills are skills well covered by the education curricula in India, in comparison with the rest countries that such skill is not so well covered. Chinese teachers seem to find more Flexibility, Team Work and Adaptability in their education curricula, whereas Business Literacy and Financial Literacy are the skills less found. Summarizing the above results one can see that the skills most covered by education curricula in all three countries differ, whereas the skills less covered are more or less the same: Financial Literacy, Business Literacy, Entrepreneurial Literacy and Economic Literacy. As a result, we can claim that Education Curricula aiming to cover such skills are in need for the three Asian countries.

From the **analysis from the students' perspective about** the skills covered by the education curricula, we can see that Team Work is the skill that students come across more in their everyday school life. Moreover, Communication, Time management, Problem Solving and Collaboration are skills selected by a vast majority of students as to be found in their everyday school life. On the other hand, Entrepreneurial Literacy, Business Literacy and Economic Literacy are skills that students came across less in their everyday school life. More specifically, in Cambodia, Team Work seems to be the skill more integrated in education curricula, followed by Critical Thinking and Collaboration. Skills that students came across less are Entrepreneurial Literacy and Financial Literacy. Indian students seem to give prominence to Time Management as the skill that they came across in their everyday school life, followed by Team Work and Communication. On the other hand, Entrepreneurial Literacy, Business Literacy and Economic Literacy are skills less found in everyday school life. Lastly, Chinese students find more Adaptability, Team Work and Communication in their everyday school life, whereas Business Literacy, Financial Literacy and Entrepreneurial Literacy are skills less

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found. Summarizing, the skills that students came across more in their everyday school life may differ among the three Asian countries, whereas the skills that students came across less are more or less the same: Business Literacy, Financial Literacy, Entrepreneurial Literacy, Economic Literacy.

2.2 Frequency of Assigned Tasks Cultivating 21st Century Skills

The results presented in this section refer to the frequency that the educators assign tasks that cultivate 21st Century skills. The tasks most assigned appear to be those cultivating *Critical Thinking*, which are being assigned between *1-3 times per month* and *1-3 times per week*. On the other hand, less assigned tasks appear to be those cultivating the *Use of Technology as a Tool for Learning* with the frequency of such assigned tasks to be found between *A few times a semester* and *1-3 times per week*. Concerning the frequency of tasks that teachers assign to students, we can see that *Critical Thinking* is overall a skill that seems to be well cultivated in the education curricula of the Asian countries. Other skills that seem to be well cultivated are *Collaboration, Communication, Innovation and Self Direction*. Less cultivated skill appears to be *Using Technology as a tool for learning and Making Local/Global Connections*.

As for the results concerning the skills well or poorly covered by all three Asian countries, we have seen that for the three countries combined the skills less covered are *Using Technology as a tool for learning and Making Local/Global Connections*, but that is not always the case.

Cambodian educators assign more tasks to cultivate the skill of *Collaboration* followed by the skill of *Critical Thinking*. Such tasks are assigned between *1-3 times per month* and *1-3 times per week*, whereas the *Use of Technology as a Tool For Learning* seems to be the less cultivated skill in Cambodian education which seems to be cultivated *Almost never* or *A few times a semester*. Moreover, *Making Global/Local Connections* for the cultivation of which tasks are assigned little more than a *few times a semester*. Indian educators seem to assign more tasks to cultivate *Critical Thinking* and *Innovation* while the *Use of Technology as a tool for learning* is the least cultivated skill. One should notice however that Indian educators seem to assign tasks cultivating 21st century skills between *1-3 times per month* and *1-3 times per week*. Chinese educators, seem to assign more tasks for the cultivation of *Critical Thinking,* followed by *Collaboration* and *Communication*. Least tasks seem to be assigned for cultivation of *Making Local/Global Connections*. Such tasks seem to be assigned little more times than *a few times a semester*.

Summarizing, the least cultivated skill (skill that least tasks are assigned to students in order to be cultivated) is *Using Technology as a tool for Learning, which is a priority for the educational programme that is going to be developed in the next work*

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packages. The country that mostly lacks cultivating this skill, in the sense of assigning least tasks to students is *Cambodia*. *Making Global/Local Connections* skill seems to be also poorly cultivated in China and Cambodia mostly. One should notice that Indian teachers seem to assign tasks to cultivate almost equally all eight 21st Century skills.

2.3 Teacher's Perceptions on Teaching, Learning and Assessing 21st Century Skills

According to the educators' answers, the skill that, that has been most taught, learned and assessed appears to be *Communication*. Moreover, *Critical Thinking, Collaboration, Innovation, Self-Direction and Making Local Connections* are skills that according to educators' belief are well taught, learned and assessed. On the contrary skills less assessed are *Making Global Connections* and *Using Technology as a Tool for Learning*. Teachers find the *Use of Technology as a Tool for Learning* to be taught, learned and assessed at a *minor to moderate extent* whereas *Making Local/Global Connections* seem to be taught, learned and assessed to a moderate extent, but clearly less than the rest of 21st Century Skills. These results partially confirm the results gained by analyzing the frequency of task assignment cultivating each skill. In both cases the *Use of Technology as a tool for Learning* seems to be the least taught, Learned and assessed 21st Century Skill, which confirms the relatively few tasks cultivating this skill that have been assigned. Furthermore, *Making Global/Local Connections* are skills that teachers find as being moderately taught, learned and assessed while at the same time tasks cultivating these skills have been assessed between *once in a semester* and *once in a month*.

Regarding educators' perceptions on teaching learning and assessing 21st Century Skills for each country we can see that in Cambodia, educators find the *Use of Technology as a Tool for learning* being taught, learned and assessed in a minor extent, while *Making Global/Local Connections* and *Innovation* seem to be taught, learned and assessed to a moderate extent. On the other hand, the skill with the maximum mean score of the index is *Critical Thinking*. In India, educators believe that almost all of the 21st Century Skills examined are at least moderately (and many of them to a great extent) taught, learned and assessed. The least taught, learned and assessed skill seems to be *Making Global Connections* while the most seems to be *Communication*. Chinese educators' perception is that the least taught, learned and assessed skills are *Using Technology as a tool for Learning* and *Making Global/Local Connections*, while the best examined skill is *Communication*.

Summarizing the above results, one can come to the conclusion that the least taught, learned and assessed skills are *Using Technology as a Tool for learning* followed by *Making Global/Local Connection Skills*. The country that mostly lacks cultivating the *Use of Technology as a tool for learning* is *Cambodia, in the sense that that skill is more poorly* taught, *learned and assessed* according to teachers' perceptions. *Making*

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Global/Local Connections skill seems to be also poorly cultivated in China and Cambodia mostly. One should notice that Indian teachers seem to believe that all eight 21st Century Skills are moderately to greatly taught, learned and assessed.

2.4 STUDENTS 21ST CENTURY SKILLS

The students' questionnaire included the same questions as the teachers' one, as far as measuring the frequency of tasks assigned to class for cultivating 21st century skills. For example, for measuring the frequency of assigned tasks for cultivating *Global Connection Skills*, both students and educators were asked to specify the frequency that the task *"Study Information about other Countries or Cultures"* was assigned.

The results of this section refer to the frequency that the tasks cultivating 21st Century Skills are assigned to students. The tasks more assigned, according to students' belief are those cultivating *Critical Thinking*, which are being assigned between *1-3 times per month* and *1-3 times per week*. Less assigned tasks seem to me those cultivating *Communication* and *Making Local Connections* Skills. *Critical Thinking and Self-Direction* seem to be the most cultivated skills, according to students' beliefs in the sense that more tasks cultivating those skills are assigned to them. On the other hand, the least cultivated skills seem to be *Making Local Connections and Communication*.

Regarding the 21st Century Skills for each country separately we can see that in Cambodia, the most tasks assigned to students aim to cultivate the skill of *Critical Thinking* followed by the skill of *Collaboration*. Less tasks seem to be assigned to cultivate *Making of Local Connections Skills*. Indian Students find that *Critical Thinking, Self-Direction, Innovation, Global Awareness* and *Making Global and Local Connection* are all skills for the cultivation of which tasks are assigned by a mean frequency of *1-3 times per month*. Assignment of tasks is less frequent for the cultivation of *Collaboration* and *Communication*. For Chinese Students, the most frequent tasks seem to be assigned in order to cultivate *Critical Thinking* and *Self Direction*. Such tasks are assigned mostly *1-3 times per month*. Less tasks are assigned to cultivate the *Making of Local Connections*.

By examining the differences between the frequency of tasks assigned from teachers and those came across by students in everyday school life, for each of the three countries, we can see that both Cambodian Teachers and Students seem to choose *Making Local Connections* as the least cultivated skill in their country as less tasks cultivating the specific skill are signed to students. Moreover, teachers and students agree that *Critical Thinking and Collaboration* seem to be well taught skills. One should notice that according to Cambodian students *Communication* is a skill that Cambodian education curricula lacks cultivating. Indian Education Curricula seem to cultivate almost equally all 21st Century Skills since corresponding tasks, are assigned to students, according to educators' opinion more than *1-3 times per month*. That seem to be

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exactly the case with students also, apart from the skills of *Communication* and *Collaboration* for the cultivation of which Indian students have come across more seldom in their everyday school life. Both Chinese educators and students, agree that *Making Local Connections* is a skill poorly taught, in the sense that fewer tasks for it to be cultivated have been assigned. *Critical Thinking* and *Self Direction* are skills well taught according to both Chinese educators and students.

The analysis of the findings has led to the conclusion that irrespectively of the degree to which 21st century skills are included in the University and Students' Education curricula, there is still a lot of steps to be made until they are considered a priority across all education levels, leading not only to upskilled professionals, but also to responsible citizens.

3. CONTRIBUTION OF THE EXPERTS FOCUS GROUPS

This section presents the basic points of the contribution of the experts focus group that each Higher Education Institute organized to assist the process of development and give recommendations on the courses content. Further information about the experts focus groups of each university is provided in the **Appendixes 1-8**.

Following the proposal, the project is planned to focus on 4 categories of skills. These 4 categories are describing the 21st century skills in line with the European Union, Unesco and OECD categories. For example, Learning and innovative skills are often called as thinking skills in the 21st century competence models. These include creative and critical thinking skills as well and use of metacognition or learning to learn skills. The experts focus groups of **UoI** (**Appendix 1**) offered an overview about skills and competences in the 21st century education through concrete examples. Furthermore, connections were made with arts and mathematics as well as with STEAM education.

There has been a long discussion all over the world about the competences needed in rapidly changing societies and these competences have been called as 21st century skills/competences or generic/transversal competences. These 21st century skills/competences describe the broad range of competencies necessary to participate fully in modern societies and to support the employability of citizens. However, there are several definitions and connotation related to these competences. For example, UNESCO emphasizes in their definition learning and education for sustainable development.

In the UNESCO Universal Learning description, they analyse what type of learning is important for all children and youth for the 21st century and for a good life. OECD (DeSeCo) analyses abilities, which meet complex demands, by mobilizing psychosocial resources in different contexts. EU (Lifelong learning, 8 key competences) analyses

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competences (knowledge, skills, and attitudes) needed for personal fulfilment, active citizenship, social inclusion and employment (Voogt and Roblin, 2012). For example, according to DeSeCo (OECD, 2005), individuals in the 21st century need to be able to use a wide range of tools—including socio-cultural (language) and digital (technological) ones—to interact effectively with the environment, to engage and interact in a heterogeneous group, to perform inquiry-oriented work and problem solving, to take responsibility for managing their own lives, and to act autonomously. In this environment, both critical, including computational, and creative thinking are needed to learn these competencies.

Creative thinking and problem solving is very important to be added to the courses' content. Characteristic of problem solving, like building a robot or designing a code is a process which consists of different steps (e.g., formulation of the problem – ideation – evaluation of the ideas – choosing the solution – testing and evaluating). In this process critical, creative and computational thinking are needed. While taking into account several views related to the problem or design or while evaluating the ideas, critical thinking is absolutely necessary in problem-solving. In general, critical thinking is the analysis of facts to form a judgement. However, there are various types and situations for critical thinking and several different definitions, which generally include the rational, sceptical, unbiased analysis, or evaluation of factual evidence. In this study, creativity is being understood as a context-related process to generate or recognize ideas, alternatives, or possibilities to solving problems individually or collaboratively with others, and can be considered as original, valuable, and useful by a reference group.

Creative thinking is needed while generating and playing with unusual and radical ideas related to the problem or design. Creative thinking can be stimulated both by an unstructured process such as brainstorming, and by a structured process such as lateral thinking (Fisher, 2006). Computational thinking is needed in problem-solving in the context of designing a code or robot. It is needed in designing computations that get computers to do jobs and explaining and interpreting the world as a complex of information processes. The characteristics of computational thinking are decomposition, pattern recognition or data representation, generalization or abstraction, and algorithms (Grover & Pea, 2013).

The skills to innovate or employ creative, critical and computational thinking, cannot be cultivated through educational practice focusing heavily on the memorization of knowledge without providing opportunities for students to transfer them into practice and use knowledge in various problem-solving situations. There are urgent calls for innovative educational approaches worldwide that can foster the learning of 21st century competences, especially competences needed for innovators including critical thinking, problem-solving, creativity, inventiveness, collaboration and teamwork, and

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communication skills through transdisciplinary, learner-centred, collaborative, and project-based learning (PBL).

Previous pedagogical approaches have been designed according to learning science research outcomes. One concrete ped approach, I have followed is project-based learning (PBL). Krajcik and Shin (2015), emphasized the following characteristics of these approaches and describe PBL as an example approach:

• PBL starts with a driving question, that is, a problem to be solved and focuses on the learning goals of the curriculum that students are required to master.

• Students are active in learning and explore the driving question by participating collaboratively in scientific and engineering practices, like designing, coding, inquiring and communicating, that are central to expert performance in science and engineering.

• Students create a set of tangible products, like a program code or a robot, that address the driving question. These are shared artefacts are kind of cognitive tools and publicly accessible external representations.

Many researchers have been investigating coding and the use of robots to support education and students learning. Studies have shown that robots can help students develop problem-solving abilities and learn computer programming, mathematics, and science. The educational approach based mainly on developing logic and creativity in new generations since the first stage of education is very promising (García-Valcárcel y Caballero-González, 2019). To these aims, the use of robotic systems is becoming fundamental if applied since the earlier stage of education. In primary, secondary and k12 schools, robot programming is fun and therefore represent an excellent tool for both introducing to ICT and helping the development of logical and linguistic abilities, and creativity of children. In Finland, for example there are couple of national level development projects where 21st century competences are emphasized (Lavonen, 2020). One is OpenDigi (2019[1]), which is a consortium of several universities directed by the University of Oulu. It aims to form regional development communities (researchers, teacher educators, teacher students, primary teachers) and create approaches for producing and sharing research-based digital learning materials (content, methods and technology solutions to support digital pedagogical and learning skills) for teachers' pre- and in-service education. Moreover, they design, implement and analyse regional development community models and support in many ways digital teaching and learning in Finnish teacher education.

Another project is Creative expertise – building bridges in teachers' basic education and continuing education (ULA) is a teacher education project, which is coordinated by the University of Jyväskylä. Grounded in systemic thinking and research-based knowledge, the project will develop operating models for teacher education within the 2018–2020. Phenomenon-based and life-long learning of teachers, teacher educators and teacher students will be supported through collaboration between universities and schools,

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while utilising hybrid learning environments (combining digital and physical environments) and expertise from various disciplines. The focus is on cross-cutting themes in learning and teaching, such as multi-literacy and language awareness, the equal school, a research-minded approach to working, student motivation, and cross-curricular cooperation. (ULA, 2019[2])

Using arts in various ways such as music (singing, playing instruments, listening to music), dancing, painting, making theatre and small films, etc. fosters creativity, critical thinking, and enhances almost all of the 21st century skills. The 21st century skills are linked with emotional competence, which through a combination of abilities to deal with intrapersonal and interpersonal emotional episodes: self-awareness, self-management, responsible decision management, social-awareness and relationship skills (Raptis, 2020). In many studies artists score higher on tests of creativity than non-artists. The cause is that arts open new ways to perceive the reality and foster executive functioning and self-regulation. This art of thinking leaves no room for something to be understand as obvious. When we realize that there are many ways to "see" the world, we are always critical and we don't accept every opinion as unique or obvious. For example, arts offer opportunities for social bonding and cultural coherence. For the teachers is important that arts offer opportunities for educational motivation and re-engagement of the disaffected students. The studies have demonstrated that engagement with arts can be related to positive attitudes towards school. Participation in arts activities may increase the development of empathy and emotional sensitivity in teachers and students. In this way it is easier to collaborate in a team and to try to find a collaborative solution in a problem.

SIU experts focus group (**Appendix 2**) put emphasis on the Modules development of Thinking Skills (CTS) and Collaborative Problem-Solving Skills (CPSS) and accordingly organized a series of events, such as a roundtable discussion for development of the Modules, individual consultations with the experts, a workshop as well as provision of resources.

The aim of the roundtable was to deliberate/discuss/debate/explore the following relating to CTS & CPSS in STEM & non-STEM (Arts and humanities):

- References / Reading Materials
- Tools / Aids for training
- Method / Pedagogy of training
- Assessment tools / rubrics for acquiring content and for acquiring teaching skills
- Measurement of progress
- Content on the themes and training materials
- Educational technology and learning tasks

The draft outline of the curriculum was shared as a term of reference to deliberate on the module. 10 experts deliberated during the round table. In addition to the round

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table discussion and individual consultations, a workshop was organised for all the partner organisations/institutions for training to be received from experts and to receive inputs from partner institutions to be incorporated in the module that was developed. After receiving their inputs through meetings, the module was aligned to the requirements sent out by Banasthali Vidyapeeth (**BV**) and also other quality measures were adopted. the module was revised for logical flow and bifurcation of 260 hours into contact sessions, practical classes and self-study hours. Furthermore, they provided methods and tools to develop critical thinking skills and collaborative problem-solving skills, feedback on Inquiry, Critical Thinking, Concept, elements of Inquiry and process of Inquiry, Concepts and Examples of Critical Thinking, Strategies to develop Critical Thinking as well as connections of the skills with Indian Philosophy of the construction of a system of knowledge.

BV University organised a Focus Group Discussion on the 'Development of Study Material for 21st Century Teaching Skills' (**Appendix 3**). The main agenda of the discussion was to decide the standards and guidelines to guide the development of the study material. The Focus Group organised through Google Meet online video conferencing software. Along with the team BV, another 12 experts from the renowned education institute of India participated in the Focus Group Discussion. Major recommendations for the study material development as well as a series of guidelines were proposed. The course will be designed for the 21st Century Skills which are needed for all be the teachers or the students. The target groups for this proposed course are pre-service and in-service teachers. In the today's fast paced world, it is the need of the hour that the teachers should be well versed with the 21st Century Skills. These skills are creativity, collaboration, communication and critical thinking (4Cs). Where critical thinking is an essential skill so that the teachers and students can work independently and may be able to take decisions. The information literacy, technology literacy, leadership, social skills, initiations are also important skills in 21st Century. Therefore, this course is very much important for pre-service and in-service teachers because if they know these skills, they may be able to foster these skills to their students and in turn it would be spread in the society through these students.

The experts of **KU** (**Appendix 4**), who agreed to share the good experience, were the teachers working in the Department of Pedagogy. All subjects of these teachers are designed and taught in such programs as Childhood Pedagogy, Primary Education Pedagogy. The experts shared their subject's programmes. More specifically the programmes concern basic of career and education management, entrepreneurship education, development of teachers' research competences, development of critical and reflexive thinking, creativity, psychology and pedagogy and citizenship education. Subject curricula include purpose, summary, topics, teaching methods, and assessment methods. Many of the skills to be developed in the project (Life and career skills, Learning and innovative skills, Integration, Information and media technology skills) are

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more or less included in the topics, teaching, assessment methods, etc. in these subject programs.

The Chinese Universities, **SZPT (Appendix 5)** and **SWU (Appendix 6)** experts focus group provided input on the basic content of the course and how to make it important or interesting for learners. The modules are presented with internal logic and time continuity in the project proposal. Module 1 is about the development of critical thinking and collaborative problem-solving skills in the 21st century. Module 2 and Module 3 are solutions to specific skills and strategy issues, and Module 4 is about course evaluation. In practice, these modules need to be integrated into the subject background and into the students' professional studies. This is necessary for both pre-service and on-the-job education. It is very important to focus on making students acquire these skills in practice. Critical thinking, for instance has to be practiced has to be practiced not only in education but also when it comes to culture, even politics. When we are faced with a problem, when we want to solve it together, we have to use critical thinking, that is, everyone in the team will understand the problem from their own perspective, and the whole team is trying to use different angles and methods. Thus, different fields of experience are used in order to find a solution and in this situation critical thinking is instrumental.

Furthermore, they put emphasis on the necessity for guidance in the classroom, the significant role of Education Technology skills (based on the Technological Pedagogical Content Knowledge), especially in the pandemic era we are going through, when all courses have been changed from face-to-face mode to online mode. Obviously, this will be a trend, they noticed but commented on the application of technology in education so as to make face-to-face class more efficient, make the school class more interactive, and make the content more vivid and attractive. This must be the purpose of using teaching technology in the classroom. The development of TPACK by teachers is critical to effective teaching with technology. This is the main reason that we need to learn with technology. Concerning the authentic learning tasks, they are connected with the practical implementation of the skills in the classroom, as for example by using case studies in teaching for the development of 21st century skills and through active participation. Furthermore, action-oriented activities such as roleplays are very important.

Finally, about Optimizing Assessment for 21st century skills the experts focus groups stressed out that action teaching needs real outputs. In fact, from the real output, students' learning effect can be evaluated. The higher the effectiveness of the output, the more challenging and complex the process is. This means that students have more participation and motivation in this process. Additionally, for the courses, the real output must be the joint output of the team, but this joint output should not be used as the main evaluation standard of the individuals in the team. The main evaluation

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criteria for individuals should be based on the degree and quality of work that the individuals have made for the team.

The **RUPP** University contribution of the experts focus group (**Appendix 7**) emphasized issues of policy enforcement on embedded 21st Century Skill to curriculum, sharing the needs of 21st Century Skills in education as well as at workplace, facilitate stakeholders to join course content development, linkage between project team to Ministry of Education, Youth and Sports, in Cambodia, meetings between project team, Quality Assurance Office, Procurement team, ICT Support team and other stockholders, sharing vision on how ICT can help making lifelong learning a reality, policy enforcement on using ICT for 21st Century Skill learning and teaching, allocation or endorsement the space for installment ICT equipment for 21st Century Skills classroom, participation in development course syllabus, input to course content development and to the use of a digital online education platform for learning and teaching and best practices on using ICT for learning & teaching in Cambodia.

In **UBB** University the experts focus group (**Appendix 8**) discussed and made recommendations about relevant policies and regulations on embedded 21st Century Skill to curriculum of all programs, the need analysis of 21st Century Skills for undergraduate students, participation of relevant stakeholders in course content development, curriculum development and accreditation, meetings between project team, Internal Quality Assurance Office, Procurement team, ICT Support team and other stockholders, experience on how to embedded 21st Skills for undergraduate programs, development of the course syllabus and suggestions of best practices on using ICT for learning and teaching in Cambodia.

4. DEFINITION OF THE CONTENT THEMES OF THE EDUCATIONAL PROGRAMME

The Educational program of 6-month duration includes modules for students and teachers/educators and a capacity building course material for academics and academic staff. The modules of the Educational Programme that will be developed in the next work package of the project share common areas as they address to educators and students. The content of the modules includes basic knowledge on the 21st century skills, accordance with educational trends of the 21st century as well as response to the specifics and needs of the learners of the partner countries.

The course will cover the following areas:

Module 1: Teaching critical thinking and collaborative problem-solving skills.

Module 2: Education Technology skills (based on the Technological Pedagogical Content Knowledge).

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Module 3: Authentic learning tasks: practical implementation of the skills in the classroom.

Module 4: Optimizing Assessment for 21st century skills.

While defining the content themes of the modules, one must take into account the general course objectives, the intellectual context of the level of the students, the motivation that will drive discussion and inquiry in the class, the nature of the kind of work that is expected from the students, the role of the teacher/educator, the level of interaction between students as well as with the teacher, the connection of the modules with the school curriculum, the sociocultural background of the students and other key forces that can affect or even expand the learning community.

Module 1 is addressed to pre-service or in-service teachers and concerns critical thinking and collaborative problem-solving skills for students at secondary or higher secondary education.

The content themes of the module include the concept of Inquiry and its element, definition of Critical Thinking, its characteristics and elements, description of the process of Critical Thinking, methods and tools to develop Critical Thinking Skills, the role of the teacher/educator in promoting critical thinking skills, suggested activities for Critical Thinking Skills, methods of assessment. Next, the content themes include definition of Critical Thinking, its characteristics and elements, methods and tools to develop Collaborative Problem-Solving Skills, the role of the teacher/educator in promoting Collaborative Problem-Solving Skills, suggested activities for Collaborative Problem-Solving Skills, methods of assessment.

Module 2 refers to Education Technology skills and promotes the use of technological tools and applications for teaching and learning. Pedagogical approaches and practical aspects of technology in teaching and learning are considered for the use of technology in education. The content themes of the module include an introduction, key issues, and debates concerning technology, basic concepts of computer-mediated communication, the potential use of computer-mediated communication tools, social networking, the use of computer games in education, key issues related to assessment of the use of Education Technology skills, teaching with technology, the role of the teacher/educator in promoting Education Technology skills.

Module 3 is connected with the creation of Authentic learning situations and focuses mainly on defining authentic learning, the support of Information Technology to authentic learning, importance and effectiveness of authentic learning, simulations and authentic learning, suggestions and cases of integration in classrooms for authentic learning, methods and tools to create authentic learning situations, the role of the teacher/educator in promoting authentic learning, suggested activities, methods of assessment.

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Module 4 concerns the assessment of the 21st century skills, thus, the content themes are related with the access of 21st century educational tools, such as digital media and technology, a review of technology information, literacy media, and ICT Literacy for 21st Century Skills learning and teaching, the effective use of technology in the classroom, the role of the teacher/educator in assessment, suggested activities, tools and methods of assessment, challenges on teaching and assessment and finally optimizing assessment connected with all the previous modules of the Educational Programme.

The *Capacity Building Course* aims to improve the competencies and skill levels of teachers in higher education institutions and to strengthen the innovation capacity of higher education institutions. The program will present student-centered learning, innovative teaching and assessment methods in higher education, and aspects of their practical application. The program includes theoretical and practical aspects of the study subject construction in order to achieve the goals of critical and reflective education of students and furthermore, reveals the importance of creativity in higher education, linking it to the environment and the teaching and learning process. The tasks will include theoretical knowledge and understanding practical application possibilities related to student-oriented education, development of creativity and critical and reflexive thinking as well as new teaching methods and innovative assessment tools for evaluation of students' 21st century skills.

5 CONCLUSIONS AND RECOMMENDATIONS

Aligned with the mandate of this project, a Strategic roadmap is required to offer analytical steps on how to develop courses that have integrated the Technological Pedagogical Content Knowledge (TPCK), as well as clear guidelines on how to integrate development of the skills within existing and subject-based curricula.

Recommendations

• A systematic structured comprehensive content to be rolled out as a module or course in curriculum, customised for graduate and postgraduate program, based on program focus and level

• A systematic capacity building in trainers to roll out such courses

• A systematic process of imparting and assessing progress of beneficiaries on incremental basis

• A policy to universalise these across all types of universities in India and to customise them based on programs and focus

• A policy and process to periodically evaluate and review for revision.

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Strategic Roadmap

Step 1: Organization of working groups. Establishment of ongoing collaboration of all partners as a working group so as to oversee all activities and ensure alignment with the proposal. Initiation of dialogue across partner countries' bureaus to identify collaboration pathways. Encouragement for collaboration with local government units, non-government organizations, industry, schools.

Step 2: Focus on methodological issues. Development of the outline of the methodology of the courses' content. As the focus of the educational programme syllabus will be the acquisition of 21st century skills for teaching, the skills have to be integrated in all aspects of the training: learning environment, teaching and learning methods, collaboration and networking as well as assessment.

Step 3: Preparation of the course content.

Design of the content of the modules in a weekly basis so as to cover the ECTs of each one and each Unit/Topic will include lectures, videos, resources for students (texts, articles, booklets, applets, links, videos, games etc.) and assignments.

Step 4: Development of the four modules of the educational programme. The modules are all linked as they are all for current or future teachers, so the educational aspect of the topics is important; all subjects must have more or less theoretical knowledge; all subjects must be designed to help students acquire practical abilities and skills; all subjects must include modern educational technologies; the topics in all modules must focus on 21st century skills development. Integration and correlation between all 4 modules is absolutely necessary.

Development of the capacity-building training for the academic staff.

Step 5: Development of new pedagogical approaches for integrating 21stcentury skills in teaching as well as tools for assessment of those skills in classroom.

Step 6: Process of accreditation of the educational programme and integration to the existing curricula

Step 7: Dissemination of the material and results of the educational programme through the website of the project as the main tool of dissemination. The Facebook page of the project as well as different methods such as press release, newspapers, contacting TV, articles, so as to reach the maximum of the audience are also useful means for dissemination.

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Best practices on how to teach and assess the 21st century skills

According to John Hole (2015), the 21st century teaching and learning best practices are largely the same in the course of time. Educational best practices in the 21st century skills share certain strategies and characteristics beyond time limits. Within this frame, he proposes 'ten experience-based Hallmarks of 21st Century Teaching and Learning'. These hallmarks are suggested as touchstones in the educators' teaching and learning approach. Project Based Learning, Ownership and Engagement, Collaborative Teaching and Cooperative Learning, Citizenship, Leadership and Personal Responsibility, Community Partnerships, Mastery of Curriculum and Higher Order Thinking Skills, The Teachable Moment, Reporting and Celebration, Fun.

Teaching the 21st century skills and achieving the best for learners includes the following teaching strategies/best practices:

- Understanding of the needs of the learning community as far as the 21st century skills are concerned and choosing the part and the relevant courses of the curriculum to start the development.
- Encouragement of dialogue regarding the significance of these skills for educating learners to become responsible citizens of the future.
- Creation of learning environments and teaching strategies that advance the 21st century skills.
- Engagement of learners in disciplined and at the same time innovative teaching strategies and activities so as to raise the interest of learners.
- Support of in-depth learning and inspire the learners' interest at the same time.
- Experience activities that model the selected for teaching 21st century skills in a series of meaningful activities within the learning community.
- Use of hands-on activities as well as minds-on activities reflective of the 21st century skills.
- Connection of learning activities with school cultures and expand to the wider community.
- Inclusion of all learners respecting diversity, different needs and abilities, towards eliminating any form of discrimination.
- Dissemination and exchange of experience and challenges of the teaching process within the educators' community.
- Dissemination of best practices of the 21st century skills learning activities and projects at a local and an international level.

There is a need to address to the complexity of the 21st century skills teaching and learning through the educational curricula and assessment is a crucial point, which requires explicit processes and tools. The 21st century skills of the project need to be integrated in all the modules of the educational programme and be assessed

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during the implementation in the school classrooms, labs or workshops. Using high quality assessments that measure learners' performance in the 21st century education will lead to the professional development teachers and educators, school leaders and policy makers. The 21st century skills support, enable and facilitate the fundamental skills of a curriculum, e.g., Reading, Writing, Maths, Science Education, Social studies etc. In this sense, 21st century skills assessment is part of a wider system that supports learning and is incorporated at all levels. The issues that are related to student achievement and should be taken into account during assessment are the curriculum content, the quality of instruction, the effectiveness of schools and the characteristics of learners. Furthermore, learning objectives of the Educational Programme, instructional strategies and assessment methods should be clearly aligned. Finally, assessment should include a variety of strategies such as rubrics, checklists, student contracts, self-reflection or assessment, peer review, observation, log files, anecdotal records, concept maps, questioning, portfolio review etc. Innovative teaching methodology and use of Technological Pedagogical Content Knowledge will also tackle the poor level of student learning and will address the need for 21st century students to not only be prepared for the technology of the changing world but also to acquire other skills needed in the workforce, such as problem solving and leadership skills.

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Appendix 1

University of Ioannina (UoI)
Members of the focus expert groups for the course content of the 21st TeachSkills Project

№	Full Name	Position	University, Country	Email Address
1.	**Sylvie Barma**	**Full professor**	**FSÉ Department of Teaching and Learning Studies, University of Laval, Quebec**	Sylvie.Barma@fse.ulaval.ca
	Research and contribution: -Sociocultural reading of science and technology teachers' practices in the context of curriculum reforms -Integration of socially vivid or socially vivid environmental issues into teachers' practices -Integration of 21st century digital skills to develop collaborative complex problem solving and foster knowledge co-creation -STEM Education			
2.	**Jari Lavonen**	**Professor, Head of the Department and a Professor of Physics and Chemistry Education, Supervisor for doctoral programme, Doctoral Programme in School, Education, Society, and Culture**	**Department of Education University of Helsinki, Finland**	jari.lavonen@helsinki.fi
	Research and contribution: He has been researching science and science teacher education for the last 25 years, especially the topics: science curriculum, student interest and motivation in science and the use of ICT in Science education. He has been responsible for PISA 2006 Science in Finland and national level assessment in lower and upper secondary Physics and Chemistry.			
3.	**Thomas McCloughlin**	**Assistant Professor of Biology & Education, Director of the herbarium in DCU, curator of the Science Archive**	**Primary Department School of STEM Education, Innovation & Global Studies Dublin City University, Ireland**	tom.mccloughlin@dcu.ie
	Research and contribution:			

	- Learning in biology at all levels in school education involving research - History, Philosophy and Sociology of biology at all levels in school education and in the following themes: experimental biology in history: photosynthesis, transpiration, plant growth; herbarium studies. Nature of Biology. The philosophy of biology as it relates to biology education. - Systematics: Natural variations in species, biometrical. Plant distribution and herbarium studies. Dr. McCloughlin is engaged in research concerning Rogerstown Estuary in north county Dublin, specifically on the biodiversity and how it is affected by the water quality entering the estuary, especially phosphate pollution and its sequestration. He is also currently engaged as an investigator in the EMPIRE Project in the Water Institute where he is establishing the DCU Mesocosm, funded by the EPA.			
4.	**Marilyn Fleer**	**Professor, Chair in Early Childhood Education and Development at Monash University**	**Monash University, Australia**	marilyn.fleer@monash.edu
	Research and contribution: She researches in the areas of early childhood science, engineering and technologies with particular attention on digital visual methodology framed through cultural-historical theory. Her Laureate Fellowship on the theme 'Imagination in play and imagination in STEM' investigates how families and teachers create conditions for children's conceptual thinking in play-based settings.			
5.	**Vitaly Rubtsov**	**Rector, Professor and Full Member of the Russian Academy of Education, and Honorary Professor of the University of Wisconsin, Madison, USA**	**Moscow State University of Psychology and Education**	**rectorat@list.ru**
	Research and contribution: His works concerning the issues of joint activity, group teaching/learning and, recently, developmental education are widely known in Russia and abroad. His scientific activity is closely connected with the Psychological Institute of Russian Academy of Science, where he was a fellow since 1972 and became its head in 1992 (and still holds the position today). He has been heading the Laboratory of Psychological Foundations of New Educational Technologies since 1981. Research carried out by Professor Vitaly Rubtsov describe a typology of teaching models that takes into account age-specific abilities and features of development in different groups of children, making it possible to effectively solve various problems arising in education and in teaching children with developmental disorders in particular. Being a member of the Presidium of the Russian Academy of Education and the President of the Federation of Russian Educational Psychologists, Professor Vitaly Rubtsov participates in research, organizational and practical work.			
6.	**Konstantinos Ravanis**	**Professor, Head of Science Department**	**Department of Educational Science and Early Childhood Education, University of Patras, Greece**	ravanis@upatras.gr
	Research and contribution: -Teaching and learning processes in Science Education -Approaching physical objects and their properties -Early development of phenomena and concepts in Science Education in the thinking of pre-school children -Critical approach of issues concerning the integration of Information and Communication Technologies in education -Gender factor in Science Education			

	-Teacher Training			
7.	**Mihalis Skoumios**	**Assistant Professor**	**Dept. of Primary Education, Aegean University, Greece**	skoumios@rhodes.aegean.gr
	Research and contribution: His research interests focus on (a) exploring students' perceptions and barriers to ideas and concepts of natural sciences; (b) the teaching process of pupils' perceptions and barriers in natural sciences; (c) the study of cognitive conflict procedures; (d) the study of the effectiveness of experimental activities; (e) the learning of basic ideas and concepts using "practices" of natural sciences; (g) the analysis of educational material in natural sciences, (h) the development of "integrated" educational material in mathematical and physical sciences and (i) the development of professional development programs in natural sciences.			
8.	**Maria Kaldrymidou**	**Professor**	**Department of Early Childhood Education, University of Ioannina, Greece**	mkaldrim@uoi.gr
	Research and contribution: -Representations and perceptions of Mathematics and mathematical concepts -Curricula -School textbooks -Organization and management of mathematical knowledge in the classroom -Communication and interaction in the classroom -Epistemological characteristics of school mathematics S-tudents' metacognitive and epistemological perceptions of Mathematics and mathematical concepts (rational numbers, functions, geometric concepts)			
9.	**Xanthi Vamvakousi**	**Associate Professor**	**Department of Early Childhood Education, University of Ioannina, Greece**	xvamvak@uoi.gr
	Research and contribution: -Conceptual change in mathematics learning -Rational number learning and teaching -The development of number sense in early childhood			
10.	**Theoharis Raptis**	**Associate Professor**	**Department of Early Childhood Education, University of Ioannina, Greece**	chraptis@uoi.gr
	Research and contribution: -Music education in early childhood -Philosophy of music pedagogy -Systematic music pedagogy -Pedagogy of the musical instrument and vocals -Music education in Antiquity			
11.	**Marika Syrrou**	**Professor Clinical and Basic Functional Sciences**	**University of Ioannina, Greece Faculty of Medicine, School of Health Sciences, University of Ioannina**	msyrrou@uoi.gr
	Research and contribution: -Medical Genetics (cytogenetics and molecular genetics). - Chromosomal abnormalities and genetic syndromes diagnosis. -Genetic variants associated with disease or susceptibility -Interactions of individual genetic and epigenetic profiles and pathological phenotypes. - Genes expression and methylation profiles as response to stressful environmental triggers			

	-Stressful experiences and learning disabilities.			
12.	**Fani Seroglou**	**Associate Professor**	**School of Primary Education, Aristotle University of Thessaloniki, Greece**	seroglou@eled.auth.gr
	Research and contribution: -Contribution of natural science history and philosophy to the teaching of natural sciences -Citizen Education (he has published two books on this subject: Natural Sciences for Civic Education in 2006 and Opening Science to Society in 2017) -Designing online curriculum channels on YouTube, educational Internet wikis and digital narratives about the physical sciences (atlas movies channel, atlas mooc channel, atlaswiki)			

Suggested Resources and Links

- Reference Framework of Competences for Democratic Culture Volume 1 https://www.cvs-project.eu/wp-content/uploads/2019/10/Volume-1-RFCDC.pdf
- Reference Framework of Competences for Democratic Culture Volume 2 https://rm.coe.int/prems-008418-gbr-2508-reference-framework-of-competences-vol-2-8573-co/16807bc66d
- Reference Framework of Competences for Democratic Culture Volume 3 https://rm.coe.int/prems-008518-gbr-2508-reference-framework-of-competences-vol-3-8575-co/16807bc66e
- Book: Game-Based Learning Across the Lifespan. Cross-Generational and Age-Oriented Topics https://www.researchgate.net/publication/309429252_Game-Based_Learning_Across_the_Lifespan_Cross-Generational_and_Age-Oriented_Topics
- Lavonen (2020). Curriculum and Teacher Education Reforms in Finland That Support the Development of Competences for the Twenty-First Century https://www.researchgate.net/publication/340865666_Curriculum_and_Teacher_Education_Reforms_in_Finland_That_Support_the_Development_of_Competences_for_the_Twenty-First_Century
- Barma, S., & Daniel, S. (2017). Designing Enhanced Learning Environments in Physics: An Interdisciplinary Collaborative Approach Producing an Instrument for School Success. In *Game-Based Learning Across the Lifespan* (pp. 91-113). Springer, Cham.
- Barma, S., & Daniel, S. (2011, June). Mind your game, game your mind! Mobile gaming for co-constructing knowledge. In *EdMedia+ Innovate Learning* (pp. 324-334). Association for the Advancement of Computing in Education (AACE).
- Barma, S., Daniel, S., Bacon, N., Gingras, M. A., & Fortin, M. (2015). Observation and analysis of a classroom teaching and learning practice based on augmented reality and serious games on mobile platforms. *International Journal of Serious Games, 2*(2).
- Krathwohl, D. R. (2002). A Revision of Bloom's Taxonomy: An Overview, *Theory Into Practice, 41*:4, 212-218. https://www.depauw.edu/files/resources/krathwohl.pdf
- Robotics to develop computational thinking in early Childhood Education https://www.researchgate.net/publication/332122595_Robotics_to_develop_computational_thinking_in_early_Childhood_Education

Co-funded by the Erasmus+ Programme of the European Union

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21st Teach skills

Appendix 2

Report on the Consultation with 12-15 experts

for

Module 1 – Critical Thinking Skills and Collaborative Problem-Solving Skills

Module Developed by Symbiosis International (Deemed University)

Introduction & Background

Symbiosis Law School Pune, Symbiosis Teaching Learning Resource Centre and Symbiosis Centre for European Studies, under the aegis of Symbiosis International (Deemed University) as a part of the prestigious project 21 Teach Skills, was required to develop a module of 260 hours on Critical Thinking Skills and Collaborative Problem solving skills, which is meant for e-training the teachers (Pre-service and in-service) of the Secondary and Higher Secondary across Europe, India, China and Cambodia.

In lieu of the same, a roundtable discussion for development of Modules on Critical Thinking Skills (CTS) and Collaborative Problem-Solving Skills (CPSS) was organised on 13th July 2020, from 2.30 pm to 6 pm IST online over Google meet. The recording of the round table discussion is submitted on the common OneDrive link of the Project.

For the roundtable, a concept note and an outline was shared with the experts that were invited to the round table on 10th July 2019. The aim of the roundtable was to deliberate/discuss/debate/explore the following relating to CTS & CPSS in STEM & non-STEM (Arts and humanities):

1. References / Reading Materials
2. Tools / Aids for training
3. Method / Pedagogy of training
4. Assessment tools / rubrics for acquiring content and for acquiring teaching skills
5. Measurement of progress
6. Content on the themes and training materials
7. Educational technology and learning tasks

The draft outline of the curriculum was shared as a term of reference to deliberate on the module. 10 experts deliberated during the round table.

In addition to the discussions in the round table, there were individual consultations by Dr. Shashikala Gurpur with other experts such as Dr. K P Mohanan, Dr. Madan, Dr. Pankaj Mittal, Dr. V. N. Jha, Ms. Priya Kher and Pushpaja Nambiar.

In addition to the round table discussion and individual consultations, a workshop was organised on 17th October 2021 for all the partner organisations/institutions for training to be received from experts and to receive inputs from partner institutions to be incorporated in the module that was developed.

After receiving their inputs through meetings the module was aligned to the requirements sent out by Banasthali Vidyapeeth (BV) and also other quality measures were adopted. Further the module was revised for logical flow and bifurcation of 260 hours into contact sessions, practical classes and self study hours.

Table of Chronology and Highlights of some important contributions from the experts

Date	Particulars	Name of Expert/s	Important Contributions
1st July to 13th July 2020	Spotting the resource persons from across the world and incorporation of DQ in the module	Dr. Shashikala Gurpur	• Spotting and listing suitable resources from within India and initial discussions with the resource persons from across the world on the concept of critical thinking and cognitive thinking skills • Incorporation of concept of DQ and distribution of tasks among the team members of SLS Pune and STLRC for roundtable discussion on DQ
10th July 2020	Concept note preparation and outline of the module shared with experts	Dr. Shashikala Gurpur	• To inspire Innovation, Entrepreneurship, Working On Actual problems (including fine arts, design, technology, sustainability and development), • Spotting advanced performers, gifted and leaders • Interdisciplinary collaboration - including skills to solve problem of community • Collaboration including taking initiative and leadership, compassion
13th July 2020	Roundtable discussion for development of Modules on Critical Thinking Skills (CTS) and Collaborative Problem-Solving Skills (CPSS)	1. Dr. K. P Mohanan 2. Dr. Sophia Gaikwad 3. Mr. Madan Mohan 4. Mrs. Pushpaja Nambiar 5. Ms. Kamini Saxena 6. Dr. Urvashi Rathod 7. Dr. Jatinderkumar Saini 8. Mrs. Shabari Shetty 9. Mrs. Debjani Rane 10. Priya Kher	• Gist of DQ (Digital Intelligence Quotient) Global Standards Report 2019 - Common Framework for Digital Literacy, Skills and Readiness • Brainstorming Session on Module (including suggestions to modules – Weightage, interlinking)
14th July 2020	Email with various aspects included in the draft curriculum received through	Dr. M. Madan Mohan, Pushpaja Nambiar, Devika Kulkarni, Nikita	• Digital Intelligence Quotient • Critical Thinking Concept, Characteristics and Elements • Collaborative Problem- Solving Skills

	individual consultation with Symbiosis International School Team	Johnson and Gitanjali Pillai (Team of experts from Symbiosis International School)	– Concept, Characteristics and Elements • Method and tools to develop critical thinking skills and collaborative problem solving skills
15th July, 16th July and 14th October 2020	Emails with content on Inquiry, Critical Thinking concept and process received from Dr. K P Mohanan	Dr. K P Mohanan (Founder ThinQ)	• Concept, elements of Inquiry and process of Inquiry • Concepts and Examples of Critical Thinking • Strategies to develop Critical Thinking
17th October 2020	Workshop on Module 1 – Critical Thinking Skills and Collaborative Problem Solving Skills for Partners	Dr. Mohanan with his ThinQ team members Ms. Aditi Ahuja and Ms. Reshmi Jejurikar	Critical Thinking Skills – Inculcating in Teachers (STEM & STEAM Subjects) • Process of Inquiry with Activities • Content: Perspectives on Critical Thinking • Skills and Sample Learning Tasks
		Dr. Urvashi Rathod	• Critical Thinking Concept and Process • Research and Critical Thinking • Mind Maps • Socratic Method
		Dr. Sophia Gaikwad	• Collaborative Problem- Solving Skills – Concept, Characteristics and Elements • Method and tools to develop collaborative problem solving skills • Activities for Problem- Solving Skills
		Dr. M. Madan Mohan, Ms. Pushpaja Nambiar, Devika Kulkarni, Nikita Johnson and Gitanjali Pillai (Team of experts from Symbiosis International School)	• How Teachers can Design Activities • How teachers can design Assessments for Students to enable them to use such activities for students to exercise Critical Thinking Skills • Collaborative Problem-Solving Skills: How Teachers can design Activities and How Teachers can design Assessments • STEM and STEAM examples
17th April 2021	Online Google Meeting with Dr. V N Jha to note his points of views and adding Indian Philosophical points in the Module. The draft syllabus was shared with Dr. V N Jha on 24th March 2021 by email.	Dr. V N Jha	• Indian (Vatsyayana's) Model of Enquiry in to truth (addresses following 4 aspects to arrive at the truth) • Indian Philosophy – Process of Knowing, Direct Process: Perception, Indirect Process: Inference, Language (Interpretation of Language: Purva Mimansa) • Indian Philosophy - Construction of a system of knowledge
1st July 2020 till present	Continuous and regular Reviews and Revisions	Dr. Shashikala Gurpur	• streamlining of key concepts and double revisions and reviews, proportion allotment and weightage, review and revision of modules, alignment with outcome based model and quality criteria, linking with gap and

			need analysis, periodic strategic re-alignment with other partner's work and overall objective of the project

Brief Introduction of Experts

1. **Dr. K. P Mohanan**
   - co-founder of ThinQ
   - PhD in Linguistics from Massachusetts Institute of Technology
   - Taught at the University of Texas at Austin; MIT; Stanford University; and at the National University of Singapore (NUS)
   - has made significant contributions to linguistic theory
   - co-designed with Tara Mohanan an Inquiry-Oriented undergraduate program in Linguistics at NUS
   - has worked extensively with the nature of academic knowledge and inquiry, against the backdrop of human beliefs
   - He joined the IISER-Pune Faculty in 2011, where he continued his work till he retired at the end of 2016.
2. **Dr. Sophia Gaikwad**
   - Head at Symbiosis Teaching Learning Resource Centre, Symbiosis International University
   - Been in the field of Education for the past ten years
   - Worked as an Assistant professor for students pursuing their Bachelors and Masters in Education and Educational Administration.
   - PhD is in the field of Educational Psychology, and her research work is on the theory of Multiple Intelligences.
   - Master's in English Literature as well as Masters in Education.
   - She has authored two books on 'Teaching Methodology'
   - Research papers to her credit which have been published in SCOPUS indexed journals.
   - Firm believer in the power of values, and the role of a teacher in transmitting them.
3. **Dr. M. Madan Mohan**
   - Vice Principal, Symbiosis International School, Viman Nagar
   - Trains, Guides and motivates his team of teachers in new teaching pedagogies and methods including informational skills
   - Member, School Advisory Board, Symbiosis
   - Member, Faculty Academic Integrity Panel, Faculty of Law, SIU
4. **Mrs. Pushpaja Nambiar**
   - ToK (Theory of Knowledge) Coordinator, Symbiosis International School
   - An educator for the past 20 years both national and international
   - IB Examiner for ToK
   - Skilled in Nonprofit Organizations, Secondary Education, Educational Consulting, Lesson Planning, and Educational Technology.
   - Masters and Bachelor of Education focused in Education, Biology, English
5. **Mrs. Kamini Saxena,**
   - Management Facilitator, Kaveri Group of Institutes (2015 – present)
   - More than 15 years – Principal, Kalmadi Shamrao High School
   - M.Sc. Chemistry
   - Believes in change from knowledge-based to skill-based

- Practical and activity based learning
- Value based education

6. **Dr. Urvashi Rathod**
   - Director, Symbiosis Centre for Research and Innovation, SIU
   - Professor, Symbiosis Centre for Information Technology
   - Ph.D. from Birla Institute of Technology and Science
   - Broad spectrum of experience ranging from a developer to an entrepreneur (for about 7 years) to a researcher and a teacher.
   - Teaching master level courses since last fourteen years including at the premier institutions.
   - Specialized in the discipline of software engineering and project management, keen and disciplined researcher.
7. **Dr. Jatinderkumar Saini**
   - Director, Symbiosis Institute for Computer Studies and Research, SIU
   - PhD (Computer Sci.) from IIT Mumbai, MCA [Univ. 1st rank & Gold Medals in all 3 years], BSc (Computer Sci.) [Silver Medal]
   - nearly 150 research publications including those published by Elsevier, Taylor & Francis, ACM, Springer, IEEE and InderScience
   - Prior to joining SICSR, Dr. Saini experience includes:
     - Worked as a State Government University endorsed Professor and Director.
     - Head of Department, University Coordinator, Director of AB Innovation Sankul and Zonal Exam Coordinator for entire South Gujarat under the State government's Gujarat Technological University, Ahmedabad.
     - Worked on the ambitious e-governance project of Govt. of Gujarat as well as the privilege of working at one of the only four licensed certifying authorities under Ministry of Information Technology, Govt. of India.
8. **Ms. Priya Kher**
   - learning and performance consultant who is the Director at Collective QuestTM
   - has been a trainer, facilitator and instructional designer since 1996
   - Collective QuestTM is a learning and development company that partners with organisations to deliver customized
   - Master's in Counselling Psychology from the Adler School of Professional Psychology, Chicago, USA
   - Associate Certified Coach from Erikson College International
   - She has an advanced certification in MBTI® assessment, and has an international certification to administer and interpret psychological instruments like the MBTI®, FIRO-B, and 16PF from CPP, USA.
   - Her team consists of dedicated facilitators who have rich experience in the fields of psychology, psychometric assessment, executive coaching, sociology, journalism, and technology.
9. **Ms. Shabari Shetty**
   - Visiting Faculty, Symbiosis Law School, Pune
   - BA, MA, Economics, B.Ed
10. **Ms. Debjani Rane**
    - Visiting Faculty, Symbiosis Law School, Pune
    - Cambridge, UK certified
    - Ph. D English (Advanced) from SIU
11. **Dr. Pankaj Mittal**

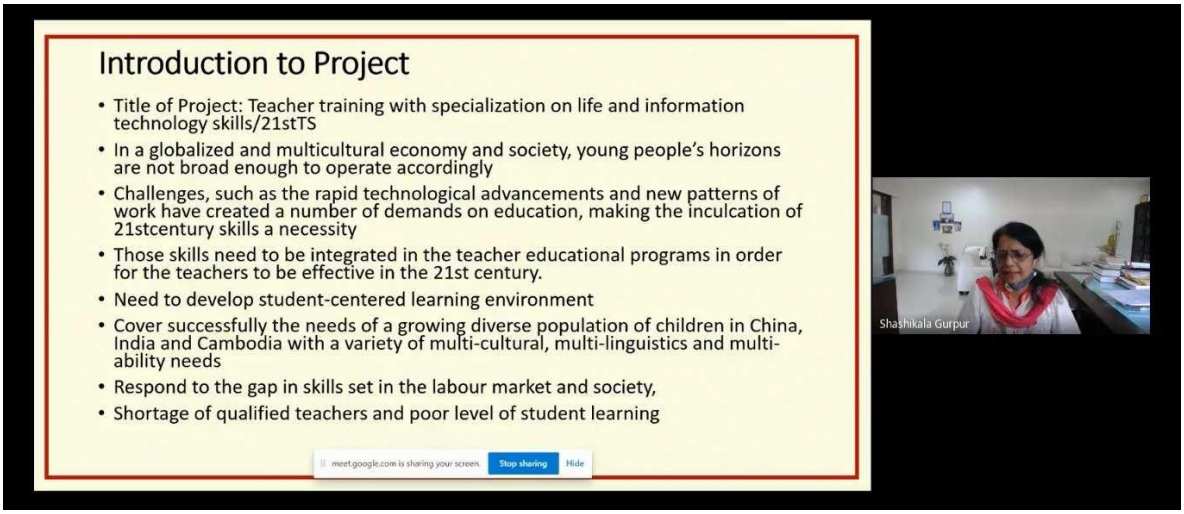
- Secretary General of the Association of Indian Universities (AIU)
- Fulbright Scholar and has been a topper in MSc and PhD in Agricultural Statistics from IARI, New Delhi
- Experience of over three decades in Higher Education in Policy Planning and Management of Higher Education
- Vice Chancellor of Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur, the first rural women university of North India, in 2008

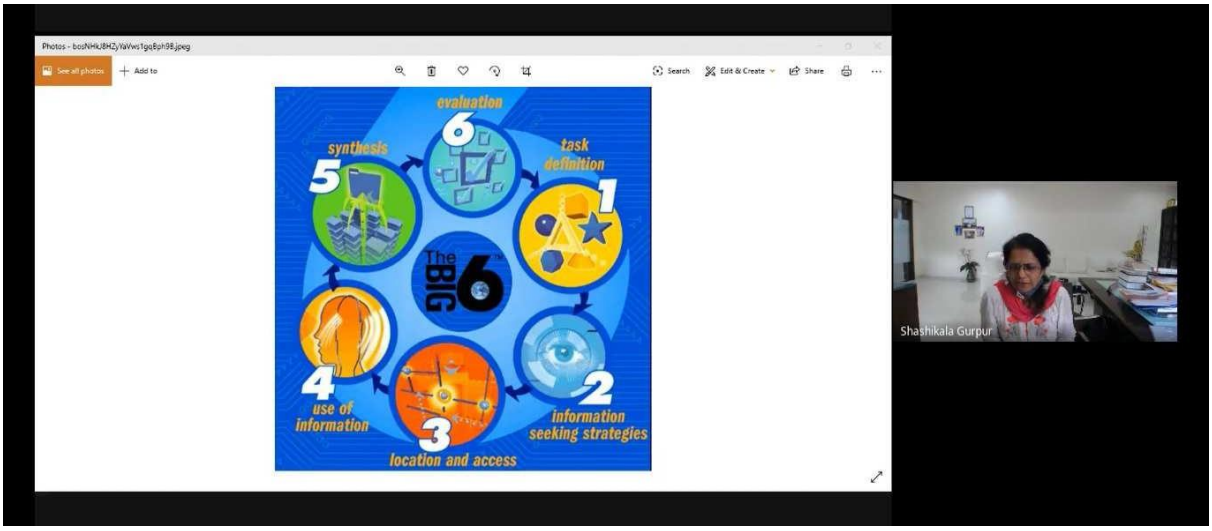
12. **Dr. V N Jha**
    - Pune University, Director of the Centre of Advanced Study in Sanskrit (1979-2006)
    - Founder Chairperson, Special Centre for Sanskrit Studies, Jawaharlal Nehru University, New Delhi (2002-03).
    - Authored and edited over 50 books (*Language, Philosophy, Logic and Epistemology*; *Language, Grammar and Linguistics in Indian Traditions*; etc.)
    - Published over 150 research articles in Indian and international journals
    - Honoured by a number of academic institutions with honours such as- Mahamahopadhyaya; Vachaspati; Pandita-sarvabhauma; D.Litt.
    - Visiting professor in Humboldt University, Germany; Nagoya University, Japan; University of Lausanne, Switzerland; and Mahatma Gandhi Institute, Mauritius; (during 1981 and 2005).

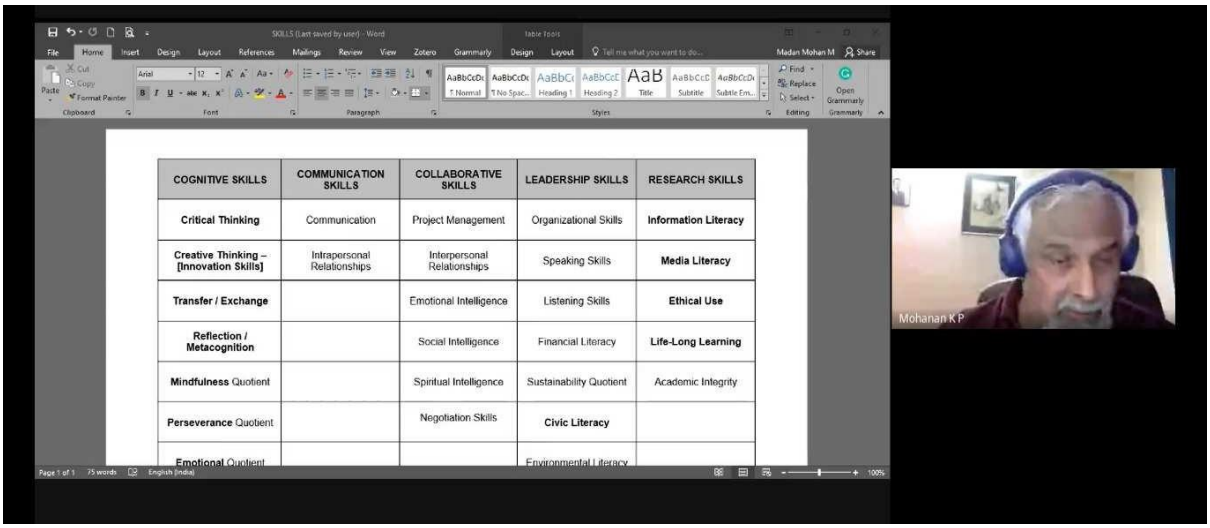
Outcome of the consultations

A robust curriculum on Critical Thinking Skills and Collaborative Problem-Solving Skills of 10 ECTS, 260 hours, with learning objectives aligned to Blooms Taxonomy, and details of 15 Units was prepared for the discussion with partners.

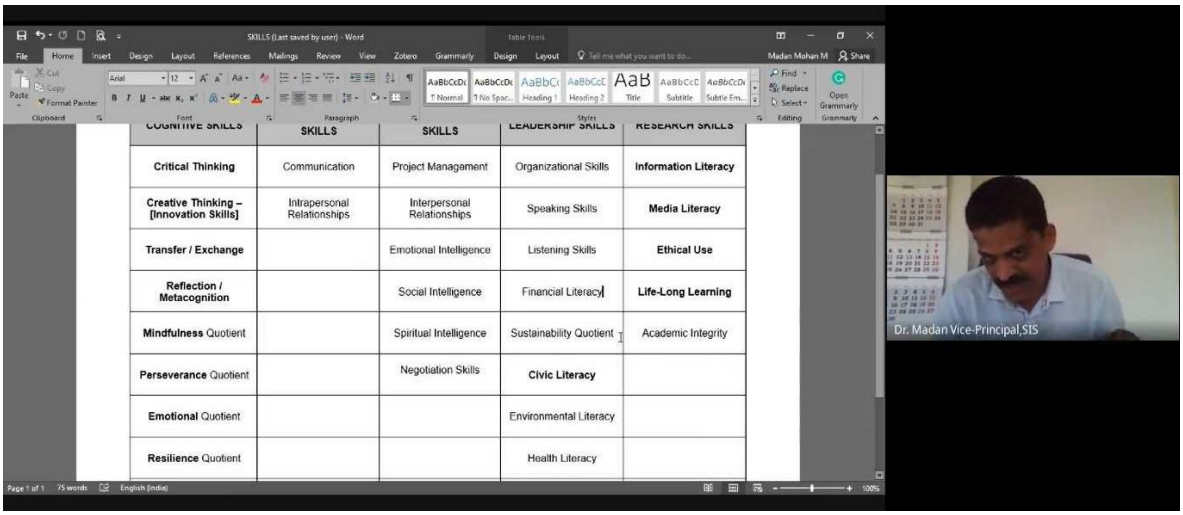
Screen Shots of Consultations







COGNITIVE SKILLS	COMMUNICATION SKILLS	COLLABORATIVE SKILLS	LEADERSHIP SKILLS	RESEARCH SKILLS
Critical Thinking	Communication	Project Management	Organizational Skills	**Information Literacy**
Creative Thinking – [Innovation Skills]	Intrapersonal Relationships	Interpersonal Relationships	Speaking Skills	**Media Literacy**
Transfer / Exchange		Emotional Intelligence	Listening Skills	**Ethical Use**
Reflection / Metacognition		Social Intelligence	Financial Literacy	**Life-Long Learning**
Mindfulness Quotient		Spiritual Intelligence	Sustainability Quotient	Academic Integrity
Perseverance Quotient		Negotiation Skills	**Civic Literacy**	
Emotional Quotient			Environmental Literacy	



COGNITIVE SKILLS	SKILLS	SKILLS	LEADERSHIP SKILLS	RESEARCH SKILLS
Critical Thinking	Communication	Project Management	Organizational Skills	**Information Literacy**
Creative Thinking – [Innovation Skills]	Intrapersonal Relationships	Interpersonal Relationships	Speaking Skills	**Media Literacy**
Transfer / Exchange		Emotional Intelligence	Listening Skills	**Ethical Use**
Reflection / Metacognition		Social Intelligence	Financial Literacy	**Life-Long Learning**
Mindfulness Quotient		Spiritual Intelligence	Sustainability Quotient	Academic Integrity
Perseverance Quotient		Negotiation Skills	**Civic Literacy**	
Emotional Quotient			Environmental Literacy	
Resilience Quotient			Health Literacy	

COGNITIVE SKILLS	COMMUNICATION SKILLS	COLLABORATIVE SKILLS	LEADERSHIP SKILLS	RESEARCH SKILLS
Critical Thinking	Communication	Project Management	Organizational Skills	**Information Literacy**
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Transfer / Exchange		Emotional Intelligence	Listening Skills	**Ethical Use**
Reflection / Metacognition		Social Intelligence	Financial Literacy	**Life-Long Learning**
Mindfulness Quotient		Spiritual Intelligence	Sustainability Quotient	Academic Integrity
Perseverance Quotient		Negotiation Skills	**Civic Literacy**	
Emotional Quotient			Environmental Literacy	

Gist of DQ (Digital Intelligence Quotient)
Global Standards Report 2019
Common Framework for Digital Literacy, Skills and Readiness – Summary

2019 Digital Intelligence (DQ) Framework
3 Levels of DQ

Digital Citizenship	Digital Creativity	Digital Competitiveness
• Safely and responsibly Use Technology	• Turn Ideas into Reality	• Drive Entrepreneurship, Growth, and Impact

Thinking Skills

Indian Philosophical Approach

Unit 1 : Concept of Truth/Reality

Language and Reality

Concept of Reality

Modeling the Universe through Language

Unit 2 : Vatsyayana's Model of Enquiry into Truth

Knower

Knowable

meet.google.com is sharing your screen. Stop sharing Hide

Knowledge

Erasmus+

BANASTHALI UNIVERSITY

KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education

Call for Proposals 2019 - EAC/A03/2018

Project - 610349-EPP-1-2019-1-EL-EPPKA2-CBHE-JP

Appendix 3

Teacher training with specialization on life and information technology skills/21stTS

Report of Focus Group Discussion on

'Development of Study Material for 21st Century Teaching Skills'

Organised by

Banasthali Vidyapith University, India

The 21stTS project (n° 610349-EPP-1-2019-1-EL-EPPKA2-CBHE-JP) has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

PROJECT COORDINATOR

University of Ioannina (Greece)

PROJECT PARTNERS

PANEPISTIMIO IOANNINON, GREECE
KLAIPEDOS UNIVERSITETAS, LITHUANIA
NOVEL GROUP SARL, LUXEMBOURG
SYMBIOSIS INTERNATIONAL UNIVERSITY, INDIA
BANASTHALI VIDYAPITH, INDIA
SOUTHWEST UNIVERSITY, CHINA
SHENZHEN POLYTECHNIC, CHINA
ROYAL UNIVERSITY OF PHNOM PENH, CAMBODIA
UNIVERSITY OF BATTAMBANG, CAMBODIA

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Title of the Project	**Teacher training with specialization on life and information technology skills**
Project number	610349-EPP-1-2019-1-EL-EPPKA2-CBHE-JP
Intellectual Output	Guideline for Development of Study Material on 21st Century Teaching Skills
Developed by	BANASTHALI VIDYAPITH UNIVERSITY
Date:	16-09-2020

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LIST OF ABBREVIATIONS

BV- Banasthali Vidyapith University

IN – India

TPCK- Technological Pedagogical Content Knowledge

4C- creativity, collaboration, communication and critical thinking

SLM- self-learning material

SM- Study material

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Report and Recommendations

Banasthali Vidyapith University organises a Focus Group Discussion on 'Development of Study Material for 21st Century Teaching Skills'. The main agenda of the discussion is to decide the standards and guidelines to guide the development of the study material. A roadmap will offer analytical steps on how to develop courses that have integrated the Technological Pedagogical Content Knowledge (TPCK) and to give recommendations on the content of the courses.

The Focus Group organised through Google Meet online video conferencing software. Along with the team BV, another 12 experts from the renowned education institute of India participated in the Focus Group Discussion The participants were

Team Banasthali

1. Prof. Ajay Surana, Head, Department of Education and Project Manager, Banasthali Vidyapith
2. Dr Sapana Sharma, Associate Professor, Banasthali Vidyapith
3. Dr Jyoti Kumari, Assistant Professor, Banasthali Vidyapith
4. Dr Mallika Shekhar, Assistant Professor, Banasthali Vidyapith
5. Dr Neeti Trivedi, Assistant Professor, Banasthali Vidyapith

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6. Dr Neetu Jain, Assistant Professor, Banasthali Vidyapith
7. Dr Rajkumar Tripathi, Assistant Professor, Banasthali Vidyapith

Other participants from Banasthali Vidyapith

8. Professor Vandana Goswami, Dean, Faculty of Education, Banasthali Vidyapith
9. Professor Kavita Mittal, Professor, Banasthali Vidyapith
10. Dr Meena Sirola, Associate Professor, Banasthali Vidyapith
11. Dr Shilpi Purohit, Associate Professor, Banasthali Vidyapith
12. Dr Sapna Verma, Assistant Professor, Banasthali Vidyapith
13. Dr Preetam Pyari, Assistant Professor, Banasthali Vidyapith

Experts From other Institutions

14. Prof. Shirish Balia, Professor and Principal, Shah Goverdhanlal Kabara. Teacher's College (CTE), Near Ummed Hospital, Jodhpur
15. Prof. Manoj Saxena, Dean, School of Education and Head, Department of Teacher Education, Central University of Himachal Pradesh
16. Dr Grishma Shukla, Associate Professor, School of Education, Jaipur National University
17. Professor R.P. Pathak, Professor & Head, Department of Education, LBS Vidyapith (Deemed University), New Delhi

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18. Professor Sandhya Gihar, Professor, Dean, Faculty of Education, Indira Gandhi National Trible University(A Central University)
19. Professor Manas Ranjan Panigrahi, Programme officer (education) in Commonwealth Educational Media Center for Asia, New Delhi.
20. Dr Gyanendra Nath Tiwari, Associate Professor, Amity University, Noida
21. Dr Dinesh Chalal from Central University of Haryana
22. Professor Indoo Pandey Khandoori, H. N. B. University, Shrinagar
23. Professor Amrith G.Kumar, Head Department of Education, Central University, Kerala
24. Professor Reeta Arora, Former Head, Department of Education, Rajasthan University
25. Professor Gopinath Sharma, Rajasthan Sanskrit University, Jaipur

The discussion initiated by a presentation of Dr Ajay Surana, the Project Manager about the proposed plan of action and the assumptions regarding study material development of 21st Century Teaching Skills. The major recommendations for the study material development were as below-

The course will be designed for the 21st Century Skills which are needed for all be the teachers or the students. The target groups for this proposed course are pre-service and in-service teachers. In the today's fast paced world, it is the need of the hour that the teachers should be well versed with the 21st Century Skills. These

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skills are creativity, collaboration, communication and critical thinking (4Cs). Where critical thinking is an essential skill so that the teachers and students can work independently and may be able to take decisions. The information literacy, technology literacy, leadership, social skills, initiations are also important skills in 21st Century. Therefore, this course is very much important for pre-service and in-service teachers because if they know these skills, they may be able to foster these skills in to their students and in turn it would be spread in the society through these students.

To develop Study material for the course the under mentioned guidelines may be followed:

1. In any Study material (SM), the quality aspect is much important. So this should be given highest priority.
2. The SM should be self-explanatory, self-motivated, self-evaluating and self-directed.
3. The SM should be developed in the manner that will encourage self-learning.
4. The SM should have clearly stated objectives, lucid language, good number of examples related to the day-to-day life of the learners, glossary, ample space for the learners to write their views, formative assessment during the chapter and summative assessment at the end of the chapter.
5. The sources consulted or quoted must be given due credit/acknowledgement.
6. The structure of the SM should include the following:

- Foreword
- Table of Content

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- ☐ Abstract of the SM
- ☐ Synopsis of the SM
- ☐ The Curriculum of the Module
- ☐ Anatomy of the question paper
- ☐ Marking Procedure

7. The structure of the Chapter should include the following:

- ☐ Chapter Number
- ☐ Title of the Chapter
- ☐ Synopsis of the Chapter
- ☐ Objectives of the Chapter
- ☐ Learning Outcomes
- ☐ Key Topics
- ☐ Sub Topics
- ☐ Contents of Sub Topics
- ☐ Formative Assessment after each sub-topic
- ☐ Summary of the Chapter
- ☐ Summative Assessment/Chapter End Exercise
- ☐ References

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 Additional Readings

8. The fonts for text and heading must be same throughout the SM.

9. The material used for tables/illustrations/pictures should be developed by either the SM developer or it should be OER.

10. The table headings should be given before the tables.

11. The graph/figure heading should be given under the graph/figure.

12. For referencing style, APA format should be used.

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Erasmus+ Programme
of the European Union

Appendix 4

Project Title

TEACHER TRAINING WITH SPECIALIZATION ON LIFE AND INFORMATION TECHNOLOGY SKILLS

Project Acronym

21st TeachSkills

WP1.3. KU experts

Prepared by: Klaipėda University

The experts of Klaipėda University, who agreed to share the good experience, were the teachers working in the Department of Pedagogy. They were 15: 3 professors, 8 associate professors and 4 lecturers. All subjects of these teachers are designed and taught in such programs as Childhood Pedagogy, Primary Education Pedagogy.

The experts shared their subject's programmes. Subject curricula include purpose, summary, topics, teaching methods, and assessment methods. Many of the skills to be developed in the project (Life and career skills, Learning and innovative skills, Integration, Information and media technology skills) are more or less included in the topics, teaching, assessment methods, etc. in these subject programs.

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	262	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Basics of Career Management

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Discussion, Formal lecture, Individual project, Literature analysis, One-to-one tutorials, Practical exercises (tasks)	Examination, Individual work
2		Discussion, Literature analysis, One-to-one tutorials, Practical exercises (tasks), Reflection on action	Examination, Individual work
3		Discussion, Library / information retrieval tasks, One-to-one tutorials, Practical exercises (tasks)	Individual work
4		Discussion, One-to-one tutorials, Reflection on action	Individual work
5		Discussion, One-to-one tutorials, Reflection on action	Examination, Individual work

Main aim

To acquaint students with the essence of career management, the basic concepts of career management, management functions, principles of personal and professional career management, factors. To reveal the links between career management and the efficiency of the institution (organization).

Summary

The course introduces the essence of career management, the basic concepts of career management, personal and professional career management functions, principles and factors. The links between career management and the efficiency of the institution (organization) are revealed.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	The concept of career management	
2.	Basic concepts of career management, career management functions	
3.	Principles and factors of personal career management	
4.	Principles and factors of professional career management	
5.	Career planning concepts	
6.	Career management models	
7.	Relationship between career management factors and career decisions	
8.	Career management and the connection between teaching / learning in the context of constant change	
9.	The role of the leader in career management	
10.	Anticipating staffing needs and career opportunities in the organization	
11.	Employee selection and career planning	
12.	Interfaces between employee career management and organizational performance.	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	15	15	0	0	50	80	3

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	0	0	7.	1	1	0
2.	2	0	0	8.	1	2	0
3.	1	1	0	9.	0	2	0
4.	1	1	0	10.	1	2	0
5.	2	1	0	11.	1	2	0
6.	2	1	0	12.	1	2	0
				Total:	15	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Individual work		34	30	*														0		
Examination	1-12	16	70	*																0
Total:	-	50	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	01L	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Basics of Education Management

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Formal lecture, Group work	Control work, Examination, Reporting for practice work
2		Discussion, Formal lecture	Examination, Reporting for practice work
3		Formal lecture, Team project	Examination, Reporting for practice work
4		Formal lecture, Team project	Examination, Reporting for practice work

Main aim

The goal - to develop students' managerial expertise to help implement the various aspects of the development of educational organizations.

Summary

The course reveals the essence of management education: education highlights the organizational structure and specificity, discussed the principles of educational management organizations and models. Taught to distinguish and analyze the various components of the management process (planning, organizing, directing, and control). The focus is on leadership theories, motivation theories, and methods of conflict management in educational organizations. Education deals with organizational culture and climate concepts of organizational culture in the education development strategy. Analyze the organization's head of educational roles and functions of the organization.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Notion of Education management, its purpose and objectives	
1.2	Structure of educational organizations	
1.3	Models of Education Management	
1.4	Principles of education organizations management	
1.5	Leader of educational organization: self-assessment, qualification improvement	
2.	Management styles in educational organizations	
3.	Motivation of pedagogues	
4.	Decision making and implementation	
5.	Management of conflicts	
6.	Notion of strategy, types and models	
6.1	Strategic planning. Mission, vision, aims.	
7.	Culture of educational organizations	
8.	Management of climate.	
9.	Education policy	
10.	Model of education change	
10.1	Basics of change management	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	15	15	0	0	50	80	3

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	1	1	0	5.	0	1	0
1.2	1	1	0	6.	1	1	0
1.3	1	1	0	6.1	1	1	0
1.4	1	1	0	7.	1	1	0
1.5	1	1	0	8.	1	1	0
2.	1	1	0	9.	1	1	0
3.	1	1	0	10.	1	1	0
4.	1	1	0	10.1	1	0	0
				Total:	15	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Group work	1-10	15	20	*														0		
Reporting for practice work	1-10	15	20	*														0		
Examination	1-10	20	60	*																0
Total:	-	50	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	009	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Citizenship Education

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	Ability to creatively employ integral study knowledge, contacting with people of different age in formal and non-formal educational activity, affected by continuous challenges.	Case analysis (Case study), Debates, Formal lecture, Literature analysis, Problem-based learning	Examination, Individual work
2	Ability to identify, select, analyze and compare relevant facts and phenomena of upbringing science.	Discussion, Seminar	Examination, Individual work
3	Ability to plan projects for different educational activity.	Debates, Seminar	Seminar
4	Ability to choose purposeful and efficient forms and methods of educative activity.	Literature analysis, Seminar	Individual work
5	Ability to work in group (team), to communicate and cooperate with other educators for improvement of quality in educative activity and for the sake of personal vocational development.	Group work, Seminar	Individual work, Seminar
6	Ability to actively join into realization of national and civil initiatives in educative activity.	Discussion, Formal lecture	Examination, Individual work
7	Ability to respect and enshrine social, cultural, linguistic and ethnic identity of modern civil society, striving for harmony with values of inter-cultural upbringing.	Discussion, Seminar	Examination, Seminar

Main aim

Citizens pay the necessary knowledge, to acquire citizenship education methods and value based position, to analyze and reflect pedagogical phenomena, to learn how to prepare young people to live in civil society and the development of civil society.

Summary

Defined the concept of citizenship, purpose and significance of the doctrine of civil society is analyzed from the earliest times of ancient Greece to the present day. Studied in a democratic society based on principles of active civil society: openness, liberalism, openness, respect for human rights and so on. Areas covers civil society problems (drug addiction, violence, refugees, etc.). In Cambodia, plans to write / draft citizenship issues.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	The concept and purpose of civic education.	
2.	The doctrine of civil society: from ancient times to the present day.	
3.	Fundamentals of democratic society and civic education.	
4.	Basic forms, principles and values of constitutional liberal democratic governance.	
5.	Problems of civil society (drug addiction, toxic addiction, alcoholism, etc.)	

№.	Sections and themes	Responsible lecturer
6.	Civil society issues (violence, refugees, terrorism, etc.)	
7.	Civil society, public policy, executive power. Levels.	
8.	The concept of a citizen, rights and responsibilities.	
9.	Human rights in the world and in Lithuania.	
10.	Human rights documents and their analysis	
11.	Democracy and educational communities.	
12.	Preparation of civic education plans / projects.	
13.	Civic education methods and implementation methods.	
14.	Civic participation (elections) and its importance. Civil society.	
15.	Citizen's knowledge, skills and internalization. Evaluation criteria.	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	30	15	0	0	115	160	6

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	0	0	9.	2	0	0
2.	4	0	0	10.	0	2	0
3.	4	0	0	11.	2	1	0
4.	4	2	0	12.	2	4	0
5.	0	2	0	13.	2	0	0
6.	0	2	0	14.	2	2	0
7.	2	0	0	15.	2	0	0
8.	2	0	0				
				Total:	30	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Examination	1-15	32	50	*																0
Individual work	1-15	33	20		*													0		
Seminar	4-6,10-14	50	30				*										0			
Total:	-	115	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	03Q	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Creativity Psychology and Pedagogy

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Formal lecture, Group work, Literature analysis	Examination, Individual project, Individual work, Reporting for practice work
2		Exercise classes, Formal lecture, Practical exercises (tasks)	Examination, Individual work
3		Exercise classes, Formal lecture, Problem-based learning, Reading list	Examination, Individual project
4		Exercise classes, Group work, Literature analysis, Reading list	Examination, Individual project, Individual work, Reporting for practice work

Main aim

To provide students with pedagogical and psychological knowledge about creativity, its origin, determinants and opportunities for development and education of creativity, to introduce the methods and programs of creativity education.

Summary

During the course, students will acquire knowledge of theoretical psychology and pedagogy about the origin of creativity, its determinants. Students will learn about creativity, about creativity educational programs, methods, and assessment.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Psychological concept of creativity.	
2.	Origin of creativity, researches of creativity process.	
3.	Components of creativity. Factors of creative behavior.	
4.	Personal features of creative people, methods of creative powers development.	
5.	Methods of cognitive and psychological assessment of creative abilities.	
6.	Creativity and mental health.	
7.	Education of creativity.	
8.	Methods of creativity education.	
9.	Possibilities for creativity development and assessment.	
10.	The influence of family and educational institutions on the development of creative abilities.	
11.	Creativity programs, experiential training. Developing creativity with the help of media and ICT.	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	20	25	0	0	62	107	4

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	2	0	7.	2	2	0
2.	1	2	0	8.	2	2	0
3.	2	2	0	9.	1	2	0
4.	2	3	0	10.	2	2	0
5.	2	3	0	11.	2	3	0
6.	2	2	0				
				Total:	20	25	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Individual work	1-11	18	25	*													0			
Individual project	1-11	18	25	*														0		
Examination	1-11	26	50	*																0
Total:	-	62	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	02Z	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Development of Critical and Reflexive Thinking

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Case analysis (Case study), Group work, Interactive lecture, Seminar	Examination, Individual work
2		Interactive lecture, Library / information retrieval tasks, Literature review presentation, Problem-based learning, Seminar	Examination
3		Case analysis (Case study), Interactive lecture, Literature review presentation, Reflection on action, Seminar	Examination, Individual work
4		Interactive lecture, Literature analysis, Problem-based learning, Seminar	Examination, Individual work
5		Interactive lecture, Literature analysis, Literature review presentation, Problem-based learning, Seminar	Examination, Individual work
6		Interactive lecture, Literature review presentation, Seminar	Examination, Individual work

Main aim

To acquaint students with the basics of critical and reflexive thinking education, to reveal the concise development of critical and reflexive thinking teaching, the content and structure of critical and reflexive thinking education at a younger school age; peculiarities of educational planning and organization, specifics of evaluation of desired results and their achievements.

Summary

Students are acquainted with the basics of critical and reflexive thinking education and development, with a concise development of critical and reflexive thinking teaching, the content and structure of critical and reflexive thinking education at a younger school age; peculiarities of educational planning and organization, specifics of evaluation of desired results and their achievements, educational resources.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	The concept of critical and reflexive thinking: psychological, pedagogical aspects	
2.	Primary, pre-school, pre-school education programs. General skills and interfaces of critical, reflexive education	
3.	The essence of critical thinking development: stages, conditions. Differences in the development of critical, informative and problem thinking	
4.	Possibilities of developing critical thinking in the lesson and additional education activities. Media and information literacy	
5.	Planning and organizing the development of critical and reflexive thinking. Tools and methods.	
6.	The concept and essence of reflexive thinking: in the aspect of constructivist learning theory.	
7.	Didactics of Constructivism: How to Develop Reflexive Thinking in Younger School Children	
8.	Documents declaring children's reflexive thinking. Measures for children's	

№.	Sections and themes	Responsible lecturer
	reflection	
9.	Roles of the pedagogue in order to ensure the expression of children's critical and reflexive thinking in lessons and activities	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	15	30	0	0	88	133	5

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	4	0	6.	2	4	0
2.	2	2	0	7.	1	2	0
3.	1	2	0	8.	2	4	0
4.	1	4	0	9.	2	4	0
5.	2	4	0				
				Total:	15	30	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Individual work	1-9	64	50	*												0				
Examination	1-9	24	50	*															0	
Total:	-	88	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	943	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Development of teachers' research competencies

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	Ability to apply basic education and knowledge-based science education, applied research to identify the problem, formulate the goal, objectives, choose and apply research strategies and methods.	Case analysis (Case study), Discussion, Literature review presentation	Examination, Individual work
2	Ability to perform data analysis of the survey results, summary and interpretation, formulate conclusions and recommendations.	Exercise classes, Literature analysis	Individual work
3	Ability to carry out independent investigation, critical and creative thinking, reflecting upon their careers designing professional development.	Exercise classes, Practical exercises (tasks)	Individual work
4	Ability to creatively and effectively apply the initial process of education information technology, students learn about the culture of information, to develop their knowledge of teaching and research competencies.	Exercise classes, Literature analysis	Examination

Main aim

To create conditions for the student to develop competencies research character.

Summary

Students' pedagogical research reveals the essence of the structure of the object of investigation and study a variety of objects. Provide knowledge about research methods, research type and research procedures, data collection, cataloging, interpretation and evaluation methods. The structure disclosed in the letter, the logical components of communication importance of research ethics is all about. Describe the requirements for written work as a design language culture volume. To become familiar with the test planning, conduct rules and basic principles of the aim and objectives of the formulation of the characteristics of the survey data collection, organization, analysis and presentation.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Value of researcher competences of teachers'; essence of pedagogical research.	
2.	Pedagogical research and planning.	
3.	Themes choice. Research problem, purpose, goal, objectives of the study formulation.	
4.	Literature Selection and analysis of pedagogical research.	
5.	Methods of study and choice of them.	
6.	Quantitative and qualitative research.	
7.	Sampling methods.	
8.	Methods of pedagogical research data collection.	
9.	Questionnaires and its conclusion.	
10.	Data analysis. Interpretation of results.	
11.	Presentation of the results of the study.	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.
Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	30	15	0	0	62	107	4

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	Oth.

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	0	0	7.	2	2	0
2.	3	0	0	8.	4	2	0
3.	3	1	0	9.	3	4	0
4.	2	2	0	10.	2	1	0
5.	3	2	0	11.	2	1	0
6.	4	0	0				
				Total:	30	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Individual work	1-11	15	25		*												0			
Individual work	1-11	16	25		*													0		
Examination	1-11	31	50		*														0	
Total:	-	62	100																	

KLAIPĖDA UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	811	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Education of Entrepreneurship

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Discussion, Interactive lecture, Practical exercises (tasks)	Individual work, Literature reviewing and presentation
2		Group work, Interactive lecture, Literature analysis, Practical exercises (tasks)	Literature reviewing and presentation
3		Discussion, Interactive lecture, Practical exercises (tasks)	Group (team) project, Individual work
4		Literature analysis, Practical exercises (tasks)	Group (team) project
5		Idea (mind) mapping, Interactive lecture, Practical exercises (tasks)	Group (team) project, Individual work
6		Interactive lecture, Practical exercises (tasks)	Literature reviewing and presentation
7		Reflection on action	Group (team) project, Reflection on action

Main aim

To help students to develop entrepreneurial competence: to analyze the economic processes taking place in Lithuania and in the world, the possibilities of private business in the pre-school education services sector.

Summary

This is an optional subject, during which the aim is to create conditions for students to develop entrepreneurial competence: to analyze the economic processes taking place in Lithuania and in the world, the possibilities of private business in the pre-school education services sector. During the lectures, the main micro and macroeconomic indicators are analyzed, the essence of entrepreneurship and its development opportunities are presented. During the practical sessions, planning the implementation of the idea of their own private kindergarten, develops entrepreneurial competence, develops attitudes of continuous improvement and change.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	Fundamental Courses of Study Field

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Introduction to the subject program, tasks of independent work, assessment criteria. Student expectations are discussed.	
2.	Analysis of pre-school education services at the microeconomic level.	
3.	Analysis of pre-school education services at the macroeconomic level.	
4.	The concept of entrepreneurship.	
5.	Entrepreneurship and educator.	
6.	Entrepreneurship education in Europe.	
7.	Entrepreneurship education in Lithuania.	
8.	Entrepreneurship in pre-school education services.	
9.	Establishment of a private pre-school education institution.	
10.	Development of advertising of pre-school education institution services.	
11.	Ethics in business.	
12.	Reflection of activity.	

№.	Sections and themes	Responsible lecturer
13.	Group project: presentation of a private kindergarten's business plan creation.	

Evaluation procedure of knowledge and abilities:
Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
Department of Pedagogy	

Study module teaching form №. 1

Semester		Mode of studies	Structure					Total hours	Credits
			Lectures	Pract.	Lab.	Dist. work	Ind. work		
A	S	D	15	30	0	0	88	133	5

Languages of instruction:

Lithuanian		English		Russian		French		German		Other	

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.	2	2	0	7.	0	2	0
2.	2	2	0	8.	1	4	0
3.	2	2	0	9.	0	4	0
4.	2	0	0	10.	2	4	0
5.	2	0	0	11.	2	2	0
6.	0	2	0	13.	0	6	0
				Total:	15	30	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Reflection on action	12	5	5	*							o								o	
Individual work	1-11	20	20	*															o	
Literature reviewing and presentation	1-11	25	25	*															o	
Group (team) project	13	38	50	*																o
Total:	-	88	100																	

Appendix 5

Focus Group

- Shenzhen Polytechnic(SZPT)
- Participants in the focus group:

  12 experts

  Moderator

  Editor

  Members of the team

- Date and time of the focus group:

  August 13th 2020, 15:30-16:20 (Beijing Time)

Moderator: What is the basic content of the course and what makes it important or interesting?

1: In my opinion, there is no way to teach this. We must focus on making students acquire these abilities in practice. For example, how do you teach critical thinking? This is particularly difficult. If it is a traditional method, it is to teach him what is critical thinking? Then why is critical thinking important? Then there is no such thing, Maybe we can take students to play some critical thinking games, let students feel a little bit about how to use critical thinking. However, in practice, students just can't use it. They won't think of the need for this kind of thing. In our culture, we don't advocate or even allow it

2：When it comes to culture, even politics, we seldom encourage critical thinking. Especially in our culture, we emphasize the difference between the superior and the inferior, respect the elderly and protect the small, we avoid conflicts, and we emphasize that harmony is the most important thing. However, to understand critical thinking from another perspective, in fact, it is very instrumental, which is an instrumental embodiment, When we are faced with a problem, when we want to solve it together, we have to use critical thinking, that is, everyone in the team will understand the problem from their own perspective, and the whole team is trying to use different angles and methods ,Find a solution to this problem from your own field or experience

3：Yes, yes. I agree with that. This is what we often encounter in the process of teaching. Just like in the class of second major, the students are from different majors. In fact, once the teacher throws the problems out in class, often students work in groups, they are from different professional backgrounds, and so critical thinking skill naturally is in use. They spontaneously and simultaneously try to solve the problem together from their own perspectives and with the knowledge they owned. In other words, these two skills are naturally symbiotic.

2：Yes, what we need to do is actually the guidance in the classroom. What the teacher should do is to guide, which can motivate the students' emotions, guide the learning directions, and make everyone actively participate in it. If there is a spark, these skills will naturally be acquired in the process. I think.

Moderator: How about Education Technology skills (based on the Technological Pedagogical Content Knowledge)

4: Let me talk about this part. I'm not sure. This module is module 2, right? Specially needed. I mean, those are teachers in service really need nowadays. In fact, we now have many platforms for us to teach. As we all know, under the influence of this epidemic, in the past half year, that is, in the last semester, we have a lot of platforms for us to teach. All of our courses have been changed from face-to-face mode to online mode. Obviously, this will be a trend. Gradually, we will rely more on this kind of technology for teaching. Even, around me, many teachers begin to feel that they prefer to teach online. At present, we have many platforms for us to choose from,like Tencent classroom, cloud class, rain class and so on. They are all very useful platforms. However, I prefer to think that we can't go online for the sake of online. For example, if you give a lecture to students and the students are just being as audiences, and when using one-line technology, what you do is to only change the scene to the online, and the interaction between you and the students is still none,I think that's a failed technology application. I don't think it has any more advantages besides with wider range of audiences. I mean, the use of technology should make your face-to-face class more efficient, make your class more interactive, and make your content more vivid and attractive,it should help you to explain a certain knowledge point more clearly, and more straightforward. That is the purpose of using teaching technology in the classroom.

5：Yes, I agree with you very much. During the epidemic period, when we investigated our teachers, the teachers in our university mainly used Tencent classroom for teaching. As you said, they only transferred face-to-face mode to online mode, and than nothing different. That is not right, and so we need more guidance in this respect.

6：The development of TPACK by teachers is critical to effective teaching with technology. This is the main reason that we need to learn with technology.

Moderator：Authentic learning tasks: practical implementation of the skills in the classroom.

7：Is it my turn? Let me think about module 3. I think we have many course in which are with case studies and teaching with cases.

8: Yes, case studies and teaching with cases, that's right. I feel that most teachers don't know why we need to do this. In fact, especially for the cultivation of the 21st century skills, we need to do this even more. Teachers in-service or teachers to-be, all need to know why we should do this? Why do we carry out these authentic learning tasks? This is based on constructivism. We believe in experience-based, believe in development, and believe in the importance of individual experience, so we need to learn by doing, right? Therefore, our learning process should be action oriented,This means that we should pay attention to the action teaching method in the teaching process, so that the above said can make sense. Case study and case teaching are only one kind of action teaching methods. Only when the students actively participate in the learning process, as mentioned above, students need to into the class and have sparks,naturally, they acquire the skills expected.

9：Action-oriented means that we must have outputs in the teaching process. Lectures and group discussions are not enough, I think. Therefore, the guidance from teachers is very important.

10：The difference between action-oriented teaching and non action-oriented teaching lies in whether there are outputs. Role play, the output of some documents and manuscripts can also do. For example, what the school of innovation and entrepreneurship is doing, its highest level output is an enterprise. They guide students to become entrepreneurs. Cultivating 21st century skills is for innovation, and innovation is for entrepreneurship. The school has really done a good job.

Moderator: : How does the course fit into the context of the discipline?Finally, we need to talk about Module 4 (10ECTS). Optimizing Assessment for 21st century skills.

11：In fact, this is very interesting. I would like to summarize that we want to develop 21st century skills: module 1 is actually about the purpose of our course - to cultivate 21st century skills in critical thinking and collaborative problem solving skills. The combination of module 2 and module 3 actually means that: when we want to develop 21st century skills, then combination of education technology skills and authentic learning tasks should be the activity and organization of the course, module 4 is about the evaluation of the course. In fact, we haven't mentioned the content of the course. This is why we need to discuss how to say course fit into the context of the discipline,In fact, this is the subject content needs to work for the authentic learning tasks. That is, our tasks need to be combined with the major and related to our discipline, which can determine our course direction and general content.

12：What you have said is very good, which makes me think of some ideas about module 4 assessment. Just mentioned that action teaching needs real outputs. In fact, from the real output, students' learning effect can be evaluated. The higher the effectiveness of the output, the more challenging and complex the process is. It means that students have more participation and motivation in this process. As the school of innovation and entrepreneurship that you mentioned above, their highest level of output is an enterprise. I believe that in the process of producing this enterprise, a lot of skills are needed, and a lot of skills could be acquired in this process. In addition, for teaching or for the courses, the real output must be the joint output of the team, but this joint output should not be used as the main evaluation standard of the individuals in the team,The main evaluation criteria for individuals should be based on the degree and quality of work that the individuals have made for the team.

Appendix 6

Focus Group at Southwest University

- Participants：

  12 experts, they are named A, B, C, D, E, F, G, H, I , J, K, L

  Moderator

  Editor

  Members of the team

- Date and time of the focus group:

  August 10th 2020, 10:30-11:30 (UTC/GMT + 8)

Moderator: What do you think the 4 modules generally?

Module 1 (10ECTS): Teaching critical thinking and collaborative problem-solving skills Leader: SCES

Module 2 (10ECTS): Education Technology skills (based on the Technological Pedagogical Content Knowledge), Leader: SWU

Module 3 (10ECTS): Authentic learning tasks: practical implementation of the skills in the classroom, Leader: SZPT

Module 4 (10ECTS): Optimizing Assessment for 21st century skills, Leader: RUPP

A: I think these four modules are very much in line with the educational theory and teaching practice, and I agree with them. The curriculum that our school is responsible for is Education Technology skills. This is an interdisciplinary discipline, computer technology, artificial intelligence, and communication. In practice, we should integrate teachers in relevant fields to complete this course together.

B: I think the focus of these four courses is not only teaching design, teachers are an indispensable factor. How do I collaborate on a course? We need to work together from teaching design to teaching implementation. Teachers from different subject

backgrounds contribute their own efforts. In the old Chinese saying, "people pick firewood and fire high".

C: I pretty much agree with that. Student-centered is very important, from the concept to practice to implement this. The traditional duck-filling teaching in China is not conducive to the development of students. This EU project as an opportunity to help change teachers' teaching philosophy and teaching methods, which is very beneficial.

D: The opening of these four courses is of great help to cultivate thinking, change ideas and reform educational practice. I am very much looking forward to learning the advanced teaching concepts and methods of EU experts and promoting teaching reform under the guidance of this EU project.

Moderator: How about Education Technology skills (based on the Technological Pedagogical Content Knowledge)

E: Educational technology, originally called "electric education" in our country. This year's outbreak objectively promoted the application of computer technology in education. The combination of online and offline teaching mode during the epidemic has injected new vitality into the traditional teaching mode. I am very optimistic about the course, of course, this cannot be separated from the guidance of EU experts.

F: Yes, I pretty much agree with you. Apart from the one in charge of our school, the other three courses are very valuable. The relationship between the four courses is mutually supportive, just like the theory of triangular mutual evidence.

G: I have an idea to make full use of online platforms for teaching such as ZOOM, WeChat, etc. Teaching on a technology platform is more in line with our philosophy.

Moderator：Authentic learning tasks: practical implementation of the skills in the classroom.

H: Task-based teaching is very popular. We introduce into our teaching, so that students can be immersive, can achieve good teaching results, promote the learning and participation of every student.

I: Task-oriented teaching is very relevant to the learning needs of students. Maslow needs a hierarchical theory to reflect this. Action-object means that we must have outputs in the thing process. It should not be limited to lectures and group discussions. Group work or thesis can be considered.

J Teamwork to complete tasks is also a way. We can think about it in teaching, and maybe EU experts have a better idea of that.

Moderator: How does the course fit into the context of the discipline? Finally, we need to talk about the 4 modules, and also Module 2 (10ECTS): Education Technology skills (based on the Technological Pedagogical Content Knowledge), Leader: SWU

K: These four modules are not only well-relevant to our EU subjects, but also closely related to the United Nations Sustainable Development Goals. These four modules actually have internal logic and time continuity. To promote skills in the 21st century: Module1 is about curriculum objectives - developing critical thinking and collaborative problem-solving skills in the 21st century. Module 2 and Module 3 are solutions to specific skills and strategy issues, and Module 4 is about course evaluation. In practice, we need to integrate these modules into the subject background and into the students' professional studies. This is necessary for both pre-service and on-the-job education. The theoretical basis of my view is task-based teaching method and SWOT analysis model. In fact, I have been trying to integrate these two theories into the subject teaching, to participate in this project, just gave me the opportunity to make it happen.

L: I agree with you that both the SWOT analytical model and the task-based approach are of great value to our modules integration into subject teaching. I would like to talk about the specific tasks of our team, namely, Module 2: Education Technology skills. The head of the previous task force has organized the discussion and has formed a text for the experts submitted to the European Union. I'm going to talk a little bit about the theoretical aspects that need attention. Of course, I'm not saying that our Module 2 is bad or worthless, I mean we have to overcome the instrumental rationalism value orientation in implementing these Modules. Whether technology is for teaching or for human beings, our ultimate goal is to promote teaching, not technology, and the two are actually the relationship between results and process. That's what I want to say for your reference.

A: The two colleagues said very well. I would like to add a little bit about collaboration. Our project is an international cooperation project, and behind the EU's Erasmus Plus higher education capacity-building project lies the EU's philosophy, the important elements of which are equality and equity, which are also reflected in the UN Sustainable Development Goals. Therefore, it is necessary for us to integrate the concept of the curriculum when implementing it.

Appendix 7

RUPP

National and International Experts join development course content of 21st Skills

№	Full Name	Position	University, Country	Email Address
1.	**Mr. Phal Des**	**Vice-rector, in-charge of Academic & Quality Assurance**	**Royal University of Phnom Penh, Cambodia**	phaldes@rupp.edu.kh
	Contribution: - Policy enforcement on embedded 21st Century Skill to curriculum of all programs; - Sharing the needs of 21st Century Skills at workplace for graduated students; - facilitate stakeholders to join course content development.			
2.	**Mr. Kean Tak**	**Vice-rector, in-charge of ICT & Digitalization**	**Royal University of Phnom Penh, Cambodia**	kean.tak@rupp.edu.kh
	Contribution: - Linkage between project team to Ministry of Education, Youth and Sports, Cambodia; - facilitate the meeting between project team, Quality Assurance Office, Procurement team, ICT Support team and other stockholders; - Sharing vision on how ICT can help making lifelong learning a reality, Cambodia; - Policy enforcement on using ICT for 21st Century Skill learning and teaching; - Allocation or endorsement the space for installment ICT equipment for 21st Century Skills classroom.			
3.	**Dr. Sam Rany**	**Vice-rector**	**National University of Battambang, Cambodia**	samrany@ubb.edu.kh
	Contribution: - sharing the need of 21st Century Skill for students, teacher, and academic staff; - sharing the specific 21st Century Skills in Cambodian market jobs; - sharing experience on how to embedded 21st Skills to programs of university.			
4.	**Dr. Srun Sovila**	**Director of Incubation Center, Lecturer: Critical Thinking & Personal Development**	**Royal University of Phnom Penh, Cambodia**	srun.sovila@rupp.edu.kh
	Contribution: - participation in development course syllabus; - provide input to course content development; - coordinate course content development amount experts; - assist in development or using of a digital online education platform for learning and teaching; - suggestion best practice on using ICT for learning & teaching in Cambodia; - review & suggest ICT equipment and platform for establishment classroom for learning & teaching of 21st Century Skill.			
5.	**Mr. Kor Sokchea**	**IT Lecturer**	**Royal University of Phnom Penh, Cambodia**	kor.sokchea@gmail.com
	Contribution: - join development questionnaires in Microsoft Form for survey of the need analysis; - review & suggest ICT equipment specification and platform for 21st Century Skill classroom.			
6.	**Mrs Soy Sambocheyear**	**IT Lecturer**	**Royal University of Phnom Penh, Cambodia**	soysambocheyear@gmail.com

	Contribution: - join development questionnaires in Microsoft Form for survey of the need analysis; - join development digital content of the course; - participation in course syllabus development with partners' university.			
7.	**Miss Chea Daly**	**Academic Skills Lecturer**	**Royal University of Phnom Penh, Cambodia**	**dalychea.it@gmail.com**
	Contribution: - course content development according to syllabus; - provide input for syllabus development; - suggest learning and teaching material for the course content.			
8.	**Dr. Khim Chamroeun**	**Deputy-director of IT Center**	**Royal University of Phnom Penh, Cambodia**	**chamroeun.khim@gmail.com**
	Contribution: - Installment classroom for 21st Century Skills learning & teaching; - Technical support in digital content development; - Technical support of platform for digital learning & teaching.			
9.	**Mr. Soeurn Mony**	**Staff of IT Center**	**Royal University of Phnom Penh, Cambodia**	**soeurn.mony@gmail.com**
	Contribution: - assist students and staff in using platform for learning & teaching of 21st Century skills; - assist in setting up platform for learning & teaching of 21st Century skills; - assist in installment ICT equipment for 21st Century Skill classroom.			
10.	**Mr. Vong Chhorvy**	**Director of Quality Assurance Center**	**Royal University of Phnom Penh, Cambodia**	**chorvy.vong@gmail.com**
	Contribution: - provide guideline for development course to align with quality standard at university level; - join development quality and evaluation report; - join kick-off meeting with project partners, representative RUPP as Quality Assurance experts; - provide criteria on the course content to meet university quality standard; - monitoring & evaluation on implementation of the course at university.			
11.	**Mr. Nhoung Sovan**	**Deputy-director of Quality Assurance Center**	**Royal University of Phnom Penh, Cambodia**	**nhoung.sovoan1981@gmail.com**
	Contribution: - join development quality and evaluation report; - join evaluation on course syllabus of the course; - join development of reports.			
12.	**Prof. Dr. Katerina Plakitsi**	**- President ISCAR - Head Dept. of Early Childhood Education**	**University of Ioannina, Greece**	**kplakits@uoi.gr**
	Contribution: - facilitate/coordinate/lead meeting between RUPP experts with international experts in 21st Century Skill; - provide input for development of course content; - advice consequent activities in course development.			
13.	**Dr. Ajay Surana**	**Head, Department of Education**	**Banasthali Vidyapith University, India**	**ajaysurana@banasthali.in**
	Contribution: - provide input syllabus of course content; - suggest learning and teaching material of the course.			
14.	**Dr. Reda Jacynė**	**Head of the Office of Studies**	**Klaipeda University, Lithuania**	**vismantiene.r@gmail.com**
	Contribution:			

	- provide input syllabus of course content; - suggest learning and teaching material of the course.			
15.	**Dr. Shashikala Gurpur**	**Dean, Faculty of Law, Symbiosis International**	**Deemed University, India**	**shashi.gurpur@gmail.com**
	Contribution: - provide input syllabus of course content; - suggest learning and teaching material of the course.			
16.	**Dr. Yaxin Li**	**-**	**Shenzhen Polytechic, China**	**qinyi.tan@outlook.com**
	Contribution: - provide input syllabus of course content; - suggest learning and teaching material of the course.			

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Appendix 8

Ministry of Education, Youth, and Sport
National University of Battambang (NUBB)

National and International Experts join development course content of 21st Skills

№	Full Name	Position	University, Country	Email Address
1.	**Dr. Sam Rany**	**Vice-rector, in-Charge of Research and Development**	**National University of Battambang, Cambodia**	sam.rany@nubb.edu.kh
	Contribution: - Relevant policies and regulations on embedded 21st Century Skill to curriculum of all programs; - Sharing the need analysis of 21st Century Skills for undergraduate students; - Facilitate relevant stakeholders to participate in course content development.			
2.	**Mr. Tep Neavea**	**Vice-rector, in-charge of Academic & Internal Quality Assurance**	**National University of Battambang, Cambodia**	tep.neavea@nubb.edu.kh
	Contribution: - Provide some input on curriculum development - Facilitate the meeting between project team, Internal Quality Assurance Office, Procurement team, ICT Support team and other stockholders; - Provide some information and procedures how to process a licensing/accreditation on curriculum;			
3.	**Mr. Tieng Morin**	**Dean of Faculty of Business Administration, and Tourism**	**National University of Battambang, Cambodia**	tieng.morin@nubb.edu.kh
	Contribution: - contribute the need of 21st Century Skill for students, teacher, and academic staff at NUBB - sharing the specific 21st Century Skills in Cambodian market jobs; - sharing experience on how to embedded 21st Skills for undergraduate programs			
4.	**Mr.Yoeng Hak**	**Dean of faculty of Arts, Humanities, and Education** **21st Century Skills Project Coordinator at NUBB**	**Nation University of Battambang, Cambodia**	yoeng.hak@nubb.edu.kh
	Contribution: - coordinate in development course syllabus;			

	- provide input to course content development; - coordinate course content development amount experts; - assist in development or using of a digital online education platform for learning and teaching; - suggestion best practice on using ICT for learning & teaching in Cambodia; - review & suggest ICT equipment and platform for establishment classroom for learning & teaching of 21st Century Skill.			
5.	**Mr. Eng Titya**	**Head of Technology Department**	**National University of Battambang, Cambodia**	eng.titya@nubb.edu.kh
	Contribution: - join developing questionnaires in Microsoft Form for survey of the need analysis; - review & suggest ICT equipment specification and platform for 21st Century Skill classroom.			
6.	**Mr. Horn Samart**	**Head of Science Department**	**National University of Battambang, Cambodia**	horn.samart@nubb.edu
	Contribution: - join development questionnaires in Microsoft Form for survey of the need analysis; - join development digital content of the course; - participation in course syllabus development with partners' university.			
7.	**Dr. Ngoun Thou**	**Vice-Dean of Faculty of Sociology Community Development**	**National University of Battambang, Cambodia**	ngoun.thou@nubb.edu.kh
	Contribution: - provide input on course content development based on the syllabus; - provide input for syllabus development; - suggest learning and teaching materials for the course content.			
8.	**Mr. Im Kouy**	**Vice-Dean of Faculty of Arts, Humanities, and Education**	**National University of Battambang, Cambodia**	im.kouy@nubb.edu.kh
	Contribution: - Install classroom for 21st Century Skills learning & teaching; - provide technical support in digital content development; - provide technical support of platform for digital learning & teaching.			
9.	**Mr. Tith Chandy**	**Vice-Dean of Faculty of Arts, Humanities, and Education**	**National University of BAttambang, Cambodia**	tith.chandy@nubb.edu.kh
	Contribution: - assist students and staff in using platform for learning & teaching of 21st Century skills; - assist in setting up platform for learning & teaching of 21st Century skills; - assist in installment ICT equipment for 21st Century Skill classroom.			
10.	**Mrs. Vong Sokhavy**	**Staff of Research Center Development**	**National University of Battambang, Cambodia**	vong.sokhavy@nubb.edu.kh
	Contribution: - provide guideline for development course to align with quality standard at university level; - join development quality and evaluation report; - join kick-off meeting with project partners, representative NUBB as Quality Assurance experts; - provide criteria on the course content to meet university quality standard; - monitoring & evaluation on implementation of the course at university.			
11.	**Mr. La Sopha**	**Head of Department of Education at the Faculty of Arts, Humanities, and Education**	**National University of Battambang, Cambodia**	La.sopha@nubb.edu.kh

	Contribution: - join development quality and evaluation report for rector; - join evaluation on course syllabus of the course; - join development of reports.			
12.	**Mr. Eng Keopisith**		**University of Ioannina, Greece**	engkeopisith@gmail.com
	Contribution: - provide input for development of course content; - advice consequent activities in course development.			
13.	**Mr. Hour Ry**	**Head, Department of Education**	**National University of Battambang, Cambodia**	ryhour@gmail.com
	Contribution: - provide input syllabus of course content; - suggest learning and teaching material of the course.			
14.	**Mr. Doeun Ey**	**Head of the Office of Studies**	**National University of Battambang, Cambodia**	eydoeurn7777@gmail.com
	Contribution: - provide input syllabus of course content; - suggest learning and teaching material of the course.			
15.	**Ms. Tep Vandy**	**Deputy Director of Battambang Teacher College**	**Battambang Teacher Education College, Cambodia**	vandytep28@yahoo.com
	Contribution: - provide input syllabus of course content; - suggest learning and teaching materials and pedagogy of the courses.			