1st Progress Meeting Minutes, iTEM Project, Prague, Czech Republic, 18th & 19th of June 2019

Abstract

Participants from all the partner Higher Educational Institutions (HEIs) participated in this two day progress meeting that hosted by the Biomedical Engineering Group of the CVUT in Prague, Czech Republic. The event took place from the 18th of June and its proceedings completed by the 19th of June 2019. The main objectives of this progress meeting were the following:

1. To review and report the progress of the assignments have been distributed to the partners after the kick off meeting in Crete (14th and 15th of February 2019)
2. To report the progress of the deliverables of all the work packages for the 1st six months of the project
3. To plan the actions for the next six months with special attention & priority on the following:
    a. The introduction of the examples from real life problems & other scientific topics into the curricula of Linear Algebra I and Calculus I. Four examples should be introduced by partner (advisory and test Institutions)
    b. The preparation of the four test Institutions (National University of Uzbekistan, Hadassah College, University of Mitrovica and Universum College) to start the 1st Pilot Phase with the start of the Semester (September or October depending on the Institution). The preparation mainly involves the engagement of (a) the examples through teaching; (b) the frequent testing & evaluation as a monitoring and better math understanding tool; (c) the use of Moodle as platform to upload the training

material and also use its widgets to be able to monitor students that are on risk to fall back

c. The agreement of the dates of the next Training & Progress Meeting event in Copenhagen and the Monitoring Visits in the Test Institutions

43 collaborators participated, with their names and contact details appear on table 1.

Partner	Surname and Name	e-mail
P1	PETRIDIS KONSTANTINOS	c.petridischania@gmail.com
P1	KOKKINOS EVANGELOS	ekokkinos@chania.teicrete.gr>
P2	TRIANTAFYLLOU EVANGELIA	evt@create.aau.dk
P2	TIMCENKO OLGA	ot@create.aau.dk
P3	FEUERSTEIN EVA	eva.feuerstein@fbmi.cvut.cz
P3	LHOTSKA LENKA	lenka.lhotska@fbmi.cvut.cz
P3	ROUBIK KAREL	roubik@fbmi.cvut.cz
P3	HOZMAN JIŘÍ	hozman@fbmi.cvut.cz
P4	CHORBEV IVAN	ivan.chorbev@finki.ukim.mk
P4	DIMITROVA VESNA	vesna.dimitrova@finki.ukim.mk
P4	POPOVSKA-MITROVIKJ ALEKSANDRA	aleksandra.popovska.mitrovikj@finki.ukim.mk
P5	AMMENWERTH ELSKE	elske.ammenwerth@umit.at
P6	HAREL NISSIM	nissimh@hit.ac.il
P6	BUTMAN AYELET	ayeletb@hit.ac.il
P6	GOL SHAI	shai314@gmail.com
P7	BARTHEL LAURE	laure@hac.ac.il
P7	BERMAN MICHAEL	michael@hac.ac.il
P7	LONDON ERAN	eran@hac.ac.il
P8	KARSENTY RONNIE	ronnie.karsenty@weizmann.ac.il
P8	PINTO ALON	Alon.pinto@weizmann.ac.il
P9	KARIMOV JASURBEK	karimovja@mail.ru
P9	KARIMOV JAVLON	jkarimov0702@gmail.com
P9	SADULLAEV AZIMBAY	sadullaev@mail.ru
P10	NAZAROVA GULCHEKHRA	z.otakuzieva@tuit.uz
P10	USMANOVA NARGIZA	nargizausm@mail.ru
P10	ABDULLAEVA SIMELA	s.abdullaeva@tuit.uz
P10	NIGMATOVA GULNORA	interdep@tuit.uz
P11	MEROVCI FATON	faton.merovci@umib.net
P11	SHALA MUZAFER	muzafer.shala@umib.net
P11	KRASNIQI AVDIJAJ ARBËRI	arberi.krasniqi@uni-pr.edu
P12	BERISHA ARMEND	armendberisha@universum-ks.org
P12	KABASHI FAZLI	Fazli.kabashi@universum-ks.org
P13	FAHLGREN MARIA	maria.fahlgren@kau.se
P13	BRUNSTRÖM MATS	mats.brunstrom@kau.se
P13	VINEREAN BERNHOFF MIRELA	mirela.vinerean@kau.se
P14	TRUJILLO RODRIGO	rotrujil@ull.edu.es
P14	GARCÍA ISRAEL	igarcial@ull.edu.es
P15	MAZREKAJ ARTAN	artan.mazrekaj@uni-pr.edu
P15	HALILAJ FATOS	fatos.halilaj@uni-pr.edu
P15	SHABANI ISAK	isak.shabani@uni-pr.edu
P16	TURSUNOV IMOMNAZAR	tursunov-ie64@mail.ru
P16	AKHMEDOV SHAHRIYOR	Alijon20160328@mail.ru
P16	ESHONKULOV JAVOHIR	javohire@mail.ru

Table 1: Name and Institution of the participants in the 1st Progress Meeting of iTEM, 18th and 19th of June 2019

In the following sections we summarise what has been discussed and decided along these two days in Prague.

Section I: Tuesday 18th of June 2019

The meeting started at 0930 and before this all the participants have received their budges and have signed the attendance sheets. The meeting started with greetings from **Dr. Eva Feuerstein**, the iTEM coordinator in CVUT. Continuously, **Dr Konstantinos Petridis**, the iTEM coordinator presented the objectives of the project and the meeting. Continuously asked from the eight leaders of the formed working groups during the kick off meeting in Crete (January 2019) to present their progress and their conclusions. More analytically:

Working Group # 1: Employed Course Curricula in Calculus I and Linear Algebra I within the consortium – Leading Partners HAC & HIT. **Dr Laure Barthel (HAC)**, informed the consortium for the following:

1. All the test Institutions have sent her all the requested information (Curriculum, Exam Papers, Drop and Failure Rates, exam papers) regarding the targeted modules: Linear Algebra I and Calculus I. Differences have been noticed mainly because some Institutions distribute the workload of these two modules in more semesters, than only along the 1st semester. However, colleagues from HAC and HIT managed to formulate **two joint course curricula for the Linear Algebra I and Calculus I** that share the most common taught terms among all the partners along these modules back home Institutions. These two joint curricula have been uploaded onto the one drive
2. These two joint course curricula **should not be considered as any kind of impose** to the test Institutions. The latter, if they wish, still can execute the existed curricula but they have to add to them (a) some of the suggested real life problems or examples from other scientific topics and (b) use the methods to identify (frequent testing, Moodle platform installed widgets, CAS tools etc) and provide assistance to students that are on risk to fall back
3. These two joint course curricula **will function as the indicators which examples from other scientific topics or real life problems to introduce into the existed curricula back**

home. The introduced examples should be linked with one or more terms including within the joint course curricula. The deadline to have collected all the examples titles from the partners **is by the end of July 2019**

4. In case, within these joint curricula there are not some terms that a test Institution thinks is or are very important please inform the coordinator (c.petridischania@gmail.com) for this or these terms to be considered within the joint course curricula. These terms will be considered then to be linked with a real life problem or an example from other scientific topics. Please do it **by the end of July 2019**
5. The responsible personnel of this deliverable **Dr. Laure Barthel** should write a short report (differences of the various curricula, how the joint one were created, average rejection and drop rates, comments on the received exam papers) of her findings after the collection of the requested documents from the partners. Please do it **by the end of July 2019**

Working Group # 2: Template with two examples from other scientific topics to be used as a linkage between different topics (one from Calculus I and the other from Linear Algebra I) and real life and technology. The responsible partners are HIT and HMU. Dr Nissim Harel and Dr Konstantinos Petridis presented the two approaches. The following conclusions can be extracted:

1. The two examples follow different approaches: this one from Nissim, attempts to link all the presented topics from Calculus I (Vectors) as a part of a problem. From the other hand Kostas' example links the multiplication of matrices as a powerful tool in designing laser cavities or study a laser's beam propagation through various optical elements
2. Both of the approaches can be used
3. **Dr Petridis** will be responsible to collect four examples per partner. The latter should sent indicative titles (and the term their example demonstrates) by the end of **July 2019**. The examples should be ready in their full extended format by the **August 2019**
4. **Another idea that participants propose,** was to introduce to the students, in parallel with the lecture sessions a semester project (inspired by the daily life), that can be challenged with the Math terms are learning during the semester. The

project can be considered as a part of the evaluation process. Such problems will be proposed by Karlstad's partners (5-10 such projects linked with the joint curricula of Working Group #1). **Nissim Harel** will be responsible to collect these projects from the KSU. The deadline **the end of September 2019**

5. The participants also decided that **the exam papers** should contain open type questions related to real life problems or other scientific topics. These questions will assess the understanding and assist also the realization by the students of the impact of Mathematics
6. **Dr Olga Timcenko**, has uploaded onto the one drive some work has been done in the past, regarding examples from engineering showing the power of maths. The partners can advice these documents in order to take inspiration to propose theirs

Working Group #3: This working group was led by Dr. Ivan Chorbev from UKIM. The decisions taken were the following:

1. The UKIM will help to build in the test Institutions a Moodle Platform that will contain all the tools to identify the students are risk to fall back: number of log ins, completion of the online tests
2. UKIM will install the Moodle platform in: (a) HMU, where the Moodle Platform will operate as a repository for the materials will be developed along the iTEM project; (2) NUUz for the needs of the pilot phase one (the NUUz should speak with their technical support if will be able to support such a platform); (3) HAC will not need a new MOODLE platform and will run their own with some modifications to adopt the systems of the others Moodle platforms within the project
3. UKIM will also with the help of UMIT will explain the partners how to use learning analytic tools install in Moodle to identify students understanding and performance along the targeted modules
4. UKIM will send tips how to connect Geogebra within Moodle; moreover the possibility to connect / integrate Mathematica will be checked by them
5. The Moodle platforms (in HMU, NUUz, UC and HAC) should be **ready by the end of October 2019 (responsible partner UKIM)**

Working Group Four: CVUT was responsible for this task: to check what facilities the test Institutions have to support the 'weak' students. Some of the ideas that suggested were the following:

1. More senior students, e.g. PhD students, to provide assistance to the 1st year students will need it
2. To add online teaching material that students who fall behind could have a 2nd chance to study it using their timeframe
3. To introduce the term of Academic Advisors, so students that fall behind to have the possibility to refer and be guided

Working Group Five: This group was led by the UC and HIT. Dr. Harrel and Mr. A. Berisha concluded that it is not necessary to develop a new software to be able to identify the students that risk to fall back but use the tools are provided by the MOODLE. Moreover, a report will be composed by UMIT (Elske), AAU (Eva and Olga) and KSU team with tips how to identify this group of students based on previous experiences have. Responsible for this report will be the KSU. It will be nice to be available by the end of October 2019

Working Group Six: This group was led by UMIT and Dr. E. Ammenwerth. This group checked through **Skype interviews of the teachers** the following:

1. Learning Philosophies in different test Institutions
2. Challenges in the different test Institutions regarding the learning of maths
3. Ethical Regulations in each test Institution

The Skype interviews are almost done. Along the 2nd Phase a questionnaire among the iTEM teachers will be distributed to report and address the above challenges. Until the end of September, UMIT will have submitted its reports and results. Dr. Ammenwerth envisions also the writing of a journal paper (excellent idea) from the extracted results of this work assignment. Another very good point that mentioned it was the assignment of the role of Survey Coordinator; its role is do not let to run similar and without purpose surveys within the consortium. The opposite will burn our stakeholders and will deteriorate their willing to participate to those ones that matter. Dr. Petridis, will play this role. Dr. Petridis, promised to place on a visible area on the website the surveys that we

should run and by whom in order do not have conflict with others. This will be done by the end of this month (June 2019)

Working Group Seven: Q/A run by WIS: Dr. Ronnie Karsenty and Dr Alon Pinto presented their strategies regarding the Q/A of the iTEM educational related deliverables. The decisions taken are the following:

1. All the surveys plan to take place should be evaluated first by the WIS team
2. For each survey one questionnaire will be employed
3. The WIS team by January 2020 will pay visits in the test Institutions to evaluate the application of the iTEM tools along their Calculus I and Linear Algebra I courses. A feedback report will be composed. The latter should be used as a tool to improve the teaching process along pilot phase two
4. The WIS team suggested the following: (a) The test Institutions to check if they can collect data from the students; (b) The questionnaires WIS will generate should be distributed by the test Institutions; (c) WIS team will prepare a letter to be sent to the test Institutions to explain what is the objective of each questionnaire will be sent, where the received data will be collected and for how long

Working Group Eight: ICT and VAS tools for teaching. The presentation was given by Dr R. Gonzalez from ULL. Rodrigo presented us the benefits of the use of visualizations in understanding mathematics. He showed examples from other scientific topics e.g. electronic engineering and demonstrated how different parameters within a system can change the graph's characteristics received. The physical meaning of these changes should be linked during the lecture by the teacher. The idea is that from the moment, with the use of free available software (already Rodrigo has sent a list of these available CAS tools), students manage to design (to simulate) they build their knowledge. The main objective of the iTEM project is that each provided example to be linked with a visualization. So each term is linked with an example from real life to be visualised also and be able to de shown using a smart phone. The teachers among the test Institutions will be responsible to select any CAS tool suits better to them and experiment how effective is towards teaching mathematics.

The first day ended at 1730 hrs (a lunch break at 1200 until 1330 has taken place). At the end of the day also decided the following on line tutorials to be generated by the end of September 2019:

1. How to install and use Moodle by UKIM
2. How to use Mathematica by HIT
3. How to use Geogebra by ULL

Section II: Wednesday 19th of June 2019

During the 2nd day, the meeting started at 0900 and Dr Konstantinos Petridis presented the progress of all the Work Packages one by one. More specifically:

Work Package One: Preparation

Deliverable 1.1: Document Describing the topics to be integrated into Linear Algebra & Calculus I; two examples are already available on the one drive. Please follow one of them to introduce your examples. All the partners should have contributed to this deliverable with four examples by the end of August 2019. HMU is responsible for collecting all the examples

Deliverable 1.2: Document describing the methodology of measuring the baseline; a document that describes how to measure the student's math baseline in the test Institutions. HMU team based on the joint curricula should develop some pre-tests to check students knowledge of fundamentals before join the courses of Calculus I and Linear Algebra I modules. Before the proposed tests to be released should be evaluated by all the test Institutions and feedback to be provided. This document should be ready by the end of September 2019

Deliverable 1.3: This deliverable is considered as completed. The already available tools of Moodle platform will be exploited for this task. HIT, UC and UKIM should write a short paragraph which are these tools (in collaboration with the frequent testing) to elaborate to help to identify students under risk. The report should be ready by the end of September 2019

Work Package Two: Development

Deliverable 2.1: Each test Institution should adopt the constructed examples from real life and other scientific topics (see 1.1) into its Calculus I and Linear Algebra I curricula. CVUT and HIT will compose a manual for teachers with all the provided examples and how teachers to apply these examples along their courses (Linear Algebra I and Calculus I). A draft of the manual should be ready by the end of October 2019

Deliverable 2.2: Training Seminars in innovative teaching methodologies for Academics

The iTEM consortium will plan and design a two days training course in PBL and POBL in Copenhagen (AAU) during the last two weeks of October (a doodle voting should be launched as soon as possible – by the end of June/responsible HMU). Other topics, such as using the Moodle, CAS tools along Math Education, linking Industry with Math Training will be introduced to the participants along poster sessions. Three academics per test Institution and one lecturer per consulting Institution will participate in this event. The profile of the selected Academics from the test Institutions to participate in this training event (16 hours of total training) as trainees can be:

1. Lecturers that teach Calculus I and Linear Algebra I
2. Lecturers that accept to adopt the iTEM tools
3. Lecturers with experience in teaching these courses back home
4. Academics that can train other Academics back home

From the other hand all the trainers should demonstrate experience in session will present. The AAU with the help of the coordinator and the coordinator of this WP (Nissim Harel) will compose a 1st draft of program (by August 2019) and will distribute among the consortium for feedback to be received. The program should be ready within the first two weeks of September 2019. AAU team is responsible for the organization and implementation of this event.

Deliverable 2.3: Automating Test and Practice

UKIM will be responsible to generate through Moodle in the four test Institutions, a pool of questions to be used during the testing of understanding of the terms taught. The pool of questions will be installed into the Moodle platform of the four test institutions: HAC, UC, UoM and NUUz. The 1st phase test Institutions will be responsible to generate these

questions and with the help of UKIM to install them into their platform. The test Institutions by the end of September should have generated at least the 40% of the envisioned frequent testing (eight tests have been proposed per course)

Deliverable 2.4: Building Visualizations & Computer Algebra Systems (CAS)

All the test Institutions have received licences of Mathematica (and the manual Dr. Harrel will write) will develop visualizations to help students to realize the terms and the examples presented in the class. The test Institutions that have not received Mathematica (HMU and UKIM) will develop their simulations using Geogebra. Moreover simulations will be given to the students (as the KSU is doing) to study them and realise Maths following the opposite way of that during the classroom sessions. ULL and the KSU will consult and assess the constructed visualizations by the test Institutions. At least the 40% of the simulations / visualizations should be ready for the 1st pilot phase of the iTEM (September 2019 – January 2020). This means the HAC, NUUz, UC and UoM should start to prepare their simulations.

Deliverable 2.5: Development & Training in the use of software that identifies students under risk to fall behind

UKIM will develop a tutorial how to use Moodle and Learning Analytics installed within Moodle in order to be able the trainer to identify students that are risk to fall back. UMIT can provide its expertise in using Learning Analytics to UKIM team. The tutorial should be ready by October 2019

Deliverable 2.6: Roll Out Events to test iTEM techniques and tools

Roll out events are considered the pilot phase I & II (within limited number of test Institutions) and pilot phase III (in all test Institutions) of the proposed tools. In pilot phase I that will start in October 2019 until January 2020, HAC, UC, UoM and NUUz will participate. During this phase, WIS experts will travel to check how efficient the iTEM tools are applied. A feedback report is expected to be written after such an evaluation trip

Deliverable 2.7: Intensive Courses for Students & Academics

The 1st IC will take place in Tirol (Austria) during September 2020

Deliverable 2.8: How to learn Mathematics – Guidelines for Students

The manual will be designed and be constructed by HIT and CVUT. The 1st draft should be ready by September 2020. Translation funds will be requested for its translation in Russian, Hebrew and Albanian languages.

Deliverable 2.9: iTEM Moodle Platform

HMU with the help of UKIM will establish a central Moodle platform. The latter will operate as a repository of the educational material will be generated during the iTEM project. As soon as possible a Moodle platform that contains the tools UKIM suggests will b installed in UC, UoM and NUUz for the needs of the 1st pilot phase of the iTEM project. HAC already runs its own Moodle Platform so small modifications for the needs of the iTEM project probably will be done. All the suggested Moodle platforms should be ready by the beginning of October 2019

Work Package Three: Quality Plan

Deliverable 3.1: Survey on Students Satisfaction with Math Teaching Delivery Techniques & Tools / Realization of Math Potential & Motivation

A questionnaire was run by UKIM, HMU, TUIT and HAC during the 1st phase of the project. A short report based on the findings of this questionnaire in these tests Institutions should be composed by each one of them and be sent to WIS – squad. The results will depict the motivation to run this project in the test Institutions. Dr Petridis presented very shortly the main results extracted from this survey. **These reports should be on the hands of WIS by the end of July 2019. Responsible of running this survey is HMU**

Deliverable 3.2: Survey on Teachers perspective regarding teaching delivery strategies and ICT tools and their impact on students Math skills development. This task is very much linked with the work & assignments of Working Group Six. The results will be ready by September 2019

Deliverable 3.3: Assess Student's Math Understanding

The baseline of students understanding before the iTEM application, will be the last five years success/drop out rates in the test Institutions. During the 1st pilot phase (application

of the iTEM principles) frequent testing, offered support, link of maths with technology and real life problems will be applied. Working group one (headed by HAC and HIT) should have collected these numbers (see work of working group #1 during 1st day of the meeting). The exam tests will be compared with the last five years and conclusions are expected to be extracted. Pilot phase two will be compared to pilot phase one and the average last five years results. The feedback will be received, the adjustments will be made, will help us to apply even more successful the iTEM principles during the 3rd phase of the project

Deliverable 3.4: A report based on the results of 3.1 – 3.3 deliverables will be composed by WIS. The 1st report is expected by March 2020

Deliverable 3.5: HMU and the iTEM project's coordinator with the help of the external evaluator will compose a survey among the management board of the project to evaluate the management of the projects. The objective of this questionnaire will be the management of the project to become better. The 1st questionnaire will be ready to run by July 2019

Deliverable 3.6: Quality and Completion of the promised offline and online educational material and tools. This evaluation will be based on questionnaires be build and be controlled by WIS. All the stakeholders of the project (students, teachers) should participate. The 1stsurvey should be run after the end of the 1st pilot phase (January 2020)

Deliverable 3.7: Evaluation of the PBL and POPBL techniques. The PBL and POPBL techniques after communication with the AAU experts was decided to be applied in pilot phase II along the four test Institutions. In the middle time, AAU will prepare for all the test Institutions teachers (and not only) training material and videos to be informed and be trained in these teaching approaches. In the middle time AAU and KSU will build also the projects inspired by the real world that can be challenged using Calculus I and Linear Algebra I.

Deliverable 3.8: ULL in collaboration with WIS will develop a questionnaire that will check the satisfaction of students and teachers using CAS tools during the pilot phases I, II and III. The 1st draft of such questionnaire should be ready by December 2019

Deliverable 3.9: Effectiveness of the tracking 'high to fall back' students tools. As has been discussed installed plug ins, learning analytics and frequent testing will consist the early warning systems to identify on time students of high risk to fall back. Teachers along the test Institutions should evaluate these processes. UKIM will construct such a questionnaire with the help and consulting of WIS

Deliverable 3.10 & 3.11: WIS (HMU will provide to the WIS team similar questionnaires that run the last fifteen years in similar events) will construct questionnaires to evaluate the quality and the impact of training events to its stakeholders (students and teachers). The 1st one should be ready by October 2019 (just before the event in AAU in Copenhagen)

Deliverable 3.12: HMU with the consulting of WIS will develop questionnaires to assess the website and the social media of the project. The evaluation will happen at the end of each year of the project; the first one will run by the end of November 2019

Deliverable 3.13: WIS Q/A expert teams will visit the test Institutions during the semester and will evaluate (a) how much, and (b) how well the iTEM techniques and tools are applied. The experts will attend some of the lectures and a report will be composed and be sent to the coordinator and the management board of the test Institutions. This report should be considered very much by the respective teachers and adjustments (if they will requested) should be made

Work Package Four: Dissemination and Exploitation

Deliverable 4.1: The dissemination plan is under construction. Responsible for this is HMU and the iTEM coordinator. It will be ready by the end of July 2019. The exploitation plan will be consisted from the test pilot phases will be run and the leverage of the iTEM tools and material beyond project's lifetime. As a supporting document to the dissemination plan, HMU has constructed and uploaded an Excel where all the dissemination actions taken within the consortium should be reported. Dissemination actions should be focused in Israel, Uzbekistan and Kosovo. The partners form these countries should report the coordinator by the end of July of events (conferences, meetings and Erasmus Weeks) that the project can potentially participate for the Academic Year 2019 – 20. The partners, suggested on this excel sheet to add a column with the Erasmus Plus KA1 actions of

International Mobility and Bilateral Agreements have been signed within the consortium. The coordinator accepted this wonderful idea and such a column will be added

Deliverable 4.2: ITEM website, webpages and Social Media Pages. HMU will be responsible for this task. iTEM website is under construction but live: item.chania.teicrete.gr. It will be ready by the end of July (as the 1st draft). Continuously with the help of an expert will be transformed to become little bit more professional. The partners immediately should generate weblinks in their home Institutions that disseminate their participation in the project. This should not be done later than the end of July 2019. The coordinator presented also the iTEM Facebook page. He asked the partners if we have any volunteers to run the Tweeter page but no volunteers appeared.

Deliverable 4.3: Printable Dissemination Material: posters, banners, leaflets

All the dissemination material for the 1st stage of the project is available and uploaded onto the one drive shared files. The only document that is under construction is the leaflet. HMU will prepare this file upon time

Deliverable 4.4: Electronic NewsLetter. The 1st version is available and has been distributed among the partners. The 2nd version will be prepared and be ready just after the event in AAU (October 2019)

Deliverable 4.5: Publications in International Educational Events. The 1st publication is a reality. The project will be presented, as a poster, along the 9th International Congress on Industrial and Applied Mathematics - ICIAM 2019 that will take place in Valencia, Spain. CVUT has submitted a journal publication about the project but the manuscript is under revision. Dr Ammenewerth (UMIT) through the processing of the tasks assigned into its working group, believes that a nice journal publication can come as a fruitful result. Prof. Javlon Karimov from NUUz, believes that the minutes of the meeting and the progress meeting presentation could be a nice report for the Uzbekistan Ministry of Education. Dr. Petridis will prepare a summary in English and will be sent to him to forward it to its Ministry

Deliverable 4.6: The organization of Erasmus Week in Crete with a central topic 'Teaching Mathematics' will be a task that HMU should organize by 2021

Work Package Five: Management

Deliverable 5.1: Consortium Agreements. This task has been completed. HMU has returned back to all the partners a copy of the signed consortium agreement. The bilateral approach was followed in order to satisfy all the 'peculiarities' each partner has

Deliverable 5.2: Project Manual; the project manual is not one document. It consists from (a) the pdf copy of 'How to use this grant' (available in the one drive); (b) the presentations done during the kick off meeting by the coordinator and Dr Harrel; (c) the consortium agreements. All the documents are available on the one drive, so this task is also considered done

Deliverable 5.3: Project Timeline; the latter can be seen into (a) presentation of Dr Nissim Harel during the kick off meeting in Crete; (b) presentation of Dr Konstantinos Petridis during the progress meeting in CVUT, Prague, Czech Republic; and (c) the actions to be take for the next months can be seen on the website of the iTEM project

Deliverable 5.4: Internal Reporting & Template. The internal reporting involves the reporting documents and the supporting documents. The latter include (a) the travel supporting documents (individual travel report, boarding passes, travel and hotel invoices); (b) the staff cost supporting documents (declaration of honor, copies of employment contracts with one of the partner Universities, timesheets of the program). The reporting documents include (a) the excel cost table (already available on the one drive) where the costs of the already incurred travels have been included) and (b) the progress meetings minutes. The coordinator has asked from the partners to complete the excel sheet with the expenses have been incurred for the first six months of the project. This procedure will be repeated every six months. All the supporting documents should be sent to the coordinator as well. Regarding the equipment costs we are on the final stage. Mathematica has been selected as the software to use for the simulations. The PO will be informed, the funds will be transferred to the UC and the latter will buy the licences. The latter will be distributed among the partner countries' partners (12 each). The coordinator also is on the final stage for (a) hiring the external evaluator (EVM – Spain) and the engagement of the auditors (Grant Thorton).

Deliverable 5.5: Progress and Final Report

The internal reporting process should be taken as part of the progress and the final reporting to the EACEA. The progress report should be ready and be submitted by the end of April 2020 whereas the final report should be ready by the end of January 2022.

Deliverable 5.6: The auditors will submit two reports: one just before the submission of the progress report and another one just after the submission of the final report. The Auditors will be part of the project by September 2019

Deliverable 5.7: The management online tool is available and operational. The one drive has been selected. A problem that the partners can view but cannot edit the documents uploaded should be solved by the coordinator.

Deliverable 5.8: All the progress meetings have taken place according to the plan. The next meeting will take place in Copenhagen immediately after the school there for the teachers. A doodle voting will be launched by Monday the 24th of June for the last two weeks of October.

Section IV: Conclusions & Actions to be taken

Summarizing the following priorities should be addressed before the start of the Semester in the four test Institutions (before the beginning of October 2019):

1. All the test Institutions should check the joint curricula (you will be able to find it also in the website – online document store tab section) HAC and HIT have uploaded into the one drive, and see if all the important sessions within Calculus I and Linear Algebra I have been included. In different case, please propose the definitions that are missing. The joint curricula will be used as guides for all the partners to introduce four examples from other scientific topics or real life problems linked with the existed definitions. The test Institutions if they have something to add, please **do it by the end of July 2019**
2. **All the partners,** should provide the titles of the examples will deploy (please also indicate the link with which definitions) **by the end of July 2019**. By September 2019 at least two of these examples should be ready to be used in the four test Institutions (HAC, UC, UoM, NUUz) along the pilot phase I. The document D. Olga

Timcenko has sent will be very useful. Also you can advice the format of the examples have been uploaded by Dr Petridis and Dr Harrel onto the one drive

3. **All the test Institutions** should generate eight tests that will assess students' understanding along the Calculus I and Linear Algebra I. These questions should be given to UKIM (Dr. Chorbev) to generate the pool of questions integrated into the Moodle Platform. At least the 50% of the tests should be ready **by September 2019.**
4. **UKIM in collaboration with the HMU (coordinator), UC (Kosovo), UoM (Kosovo), HAC (Israel) and NUUz (Uzbekistan)** should establish four Moodle platforms according to the specifications will be set by UKIM. HAC will adopt to Dr Chorbev suggestions (especially integration of the learning analytics, and the tools to identify students under high risks to fail) its own Moodle platform. The Moodle platforms should be functional **by the end of September 2019**
5. **Mathematica licences should be to the partners by July 2019.** Simulations to be linked with definitions within the curricula taught in Linear Algebra I and Calculus I should start to get prepared by the test Institutions and by September 2019 in the four test Institutions of pilot phase I at least 50% of them should be ready. Ideally we should have as many simulations as the examples have been introduced to address definitions within the course curricula on the test Institutions.
6. **The PBL and POPBL** principles will be applied in pilot phase II. In the middle time, AAU personnel will prepare some online material for the teachers of the test Institutions to learn and practice these techniques. KSU can contribute with the introduction of real life problems (based on the experience they demonstrate Industry meets Mathematics) as an examples the teachers can use later on. The material will be nice to be ready **by the end of September 2019**
7. **UKIM should prepare a videos (it can be videos that already exist) how to use and install Moodle by July 2019**
8. **HIT should prepare a manual how to use Mathematica for simulation actions by August 2019**
9. **ULL should prepare some videos (it can be videos that already exist) how to use GeoGebra**

10. **By the end of July the dates of the school for teachers in AAU in Copenhagen should have finalised and by the end of September its training program**

For the deadlines of the rest of the deliverables, please advice the rest of this report.

With my best regards

Kostas