

Doc. 300.1.1

Date: November 25, 2020

External Evaluation Report (Conventional-face- to-face programme of study)

- **Higher Education Institution:**
University of Cyprus
- **Town:** Nicosia
- **School/Faculty (if applicable):** Faculty of Social Sciences and Education
- **Department/ Sector:** Department of Education
- **Programme of study:** PhD in Mathematics Education (6-16 semesters, 273 ECTS)

In Greek:

Διδακτορικό στη Μαθηματική Παιδεία

In English:

Ph.D. in Mathematics Education

- **Language(s) of instruction:** Greek
- **Programme's status:** Currently Operating



The present document has been prepared within the framework of the authority and competencies of the Cyprus Agency of Quality Assurance and Accreditation in Higher Education, according to the provisions of the “Quality Assurance and Accreditation of Higher Education and the Establishment and Operation of an Agency on Related Matters Laws of 2015 to 2019” [N. 136 (I)/2015 to N. 35(I)/2019].

A. Introduction

This part includes basic information regarding the onsite visit.

The Cyprus Agency for Quality Assurance and Accreditation in Higher Education (CYQAA) charged the External Evaluation Committee (EEC) to conduct a remote external evaluation-accreditation of the following programme of study: Mathematics Education (6-16 semesters, 273 ECTS, Ph.D) offered by the University of Cyprus.

The process of evaluation included three phases:

1. Before the online site visit, we read the application of the programme provided to us, did a virtual tour of the university, and watched a streaming of one of the seminars in Mathematics Education offered by the programme.
2. During the one-day online site visit (see the Remote (online) External Evaluation schedule below), we discussed the programme with various key constituents. We talked with the Head of the department, the programs' coordinators, other senior and junior faculty members teaching in the program, students in the programme, graduates from this programme, and members of the administrative staff. We also met with the Vice Rector for Academic Affairs who is also the Chairwoman of the Internal QA Committee of the University.
3. After the online site visit, we used the information gathered to write the External Evaluation Report.

We found our experiences valuable and productive. The present report is an outcome of these experiences and deliberations. We hope that the report will serve the Cyprus Agency for Quality Assurance and Accreditation in Higher Education (CYQAA) and the Department of Education as they strive to maintain a high-quality mathematics education PhD programme.

Remote (online) External Evaluation Schedule – 23.11.2020

10:00 – 10:10

- A brief introduction of the members of the External Evaluation Committee

10:10 – 10:40

- A meeting with the Vice Rector for Academic Affairs Professor Irene-Anna Diakidoy who is also the Chairwoman of the Internal QA Committee of the University
 - short presentation of the Institution and discussion

Names of participants:

- Professor Irene-Anna Diakidoy, Vice Rector for Academic Affairs, eddiak@ucy.ac.cy
- Prof. Zacharias Zacharia, Professor of Science Education, Head of the Department of Education, zach@ucy.ac.cy
- Prof. Demetra Pitta-Pantazi, Professor of Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy
- Ms. Demetra Demetri, University Officer – QA Coordinator, demetri@ucy.ac.cy

10:40 – 10:50

- A meeting with the Head of the relevant department and the programmes' Coordinators.

Short presentation of the School's / Department's structure

Name(s) of presenter(s):

- Prof. Zacharias Zacharia, Professor of Science Education, Head of the Department of Education, zach@ucy.ac.cy
- Prof. Demetra Pitta-Pantazi, Professor of Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy

10:50 – 11:50

Programme 1:

- The programme's standards, admission criteria for prospective students, the learning outcomes and ECTS, the content and the persons involved in the programme's design and development

Name(s) of presenter(s):

- Prof. Demetra Pitta-Pantazi, Professor of Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy

11:50 - 12:00

- *Coffee Break*

12:00 – 13:00

Programme 2:

- The programme's standards, admission criteria for prospective students, the learning outcomes and ECTS, the content and the persons involved in the programme's design and development

Name(s) of presenter(s):

- Prof. Demetra Pitta-Pantazi, Professor of Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy

13:00 – 14:00

- *Lunch Break*

14:00 - 15:00

- A meeting with members of the teaching staff on each course for all the years of study (QA session).
 - Discussion on the CVs (i.e. academic qualifications, publications, research interests, research activity, compliance with Staff ESG), on any other duties in the institution and teaching obligations in other programmes.
 - Discussion on the content of each course and its implementation (i.e., methodologies, selected bibliography, students' workload, compliance with Teaching ESG).
 - Discussion on the learning outcomes, the content and the assessment of each course and their compliance with the level of the programme according to the EQF.

- Discussion on assessment criteria, samples of final exams or other teaching material and resources.

Names of participants:

- Prof. Demetra Pitta-Pantazi, Professor in Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Zacharias Zacharia, Professor of Science Education, Head of the Department of Education, zach@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy
- Prof. Charoula Angeli, Professor of Instructional Technology at the Department of Education, cangeli@ucy.ac.cy
- Dr Iliada Elia, Associate Professor of Mathematics Education in Early Years at the Department of Education, elia.iliada@ucy.ac.cy
- Dr Charalambos Charalambous, Assistant Professor of Educational Research and Evaluation at the Department of Education, charalambous.y.charalambos1@ucy.ac.cy
- Dr Marios Pittalis, Educational Personnel of Mathematics Education at the Department of Education, m.pittalis@ucy.ac.cy

15:00 - 15:10

- *Coffee Break*

15:10 – 15:30

- A meeting with members of the administrative staff.

Names of participants:

- Mrs Elena Diomidi, Acting Library Director, diomidi.elena@ucy.ac.cy
- Louis Prokopiou, University Officer, Library, prokopiou.louis@ucy.ac.cy
- Mrs Christina Georgiou-Michaelides, Secretary of the Department of Education, georgiou.christina@ucy.ac.cy
- Mrs Anastasia Costa-Demetriou, Secretary of the Department of Education, costa.anastasia@ucy.ac.cy
- Mrs Penelope Kitsiou, Secretary of the Department of Education, kitsiou.popi@ucy.ac.cy

15:30 – 16:10

- A meeting with students and graduates only

Names of participants:

- Dr Chryso Athanasiou, PhD Graduate, chrathan@cytanet.com.cy
- Dr Maria Chimoni, PhD Graduate, himonis@cytanet.com.cy
- Dr Panayiota Irakleous, PhD Graduate, irakleous.panayiota@ucy.ac.cy
- Dr Aristoklis Nicolaou, PhD Graduate, educati@cytanet.com.cy
- Dr Paraskevi Sophocleous, PhD Graduate, skevi_sophocleous@yahoo.gr
- Ms Angela Chrysostomou, PhD candidate, chrisostomou_angela@hotmail.com

- Ms Panayiota Mavri, PhD candidate, mavri.panagiota@ucy.ac.cy
- Ms Nektaria Panayi, PhD candidate, nektaria_ljump@hotmail.com
- Ms Paraskevi Chapesii, Master student, chapesii.paraskevi@ucy.ac.cy
- Ms Eleni Erodoutou, Master student, erodoutou.eleni@ucy.ac.cy
- Ms Eleni Odysseos, Master student, odysseos.o.eleni@ucy.ac.cy

16:10 – 16:25

- Discussion on the virtual visit of the premises of the institution (i.e. library, computer labs, teaching rooms, research facilities).

Names of participants:

- Prof. Demetra Pitta-Pantazi, Professor in Mathematics Education, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy
- Prof. Zacharias Zacharia, Professor of Science Education, Head of the Department of Education, zach@ucy.ac.cy
- Prof. Leonidas Kyriakides, Professor of Educational Research and Evaluation at the Department of Education, kyriakid@ucy.ac.cy
- Prof. Charoula Angeli, Professor of Instructional Technology at the Department of Education, cangeli@ucy.ac.cy
- Dr Charalambos Charalambous, Assistant Professor of Educational Research and Evaluation at the Department of Education, charalambous.y.charalambos1@ucy.ac.cy
- Dr Marios Pittalis, Educational Personnel of Mathematics Education at the Department of Education, m.pittalis@ucy.ac.cy

16:25 – 16:50

- A meeting with the Head of the relevant department and the programme's Coordinator - exit discussion (questions, clarifications).

Names of participants:

- Prof. Zacharias Zacharia, Head of the Department of Education, zach@ucy.ac.cy
- Prof. Demetra Pitta-Pantazi, Coordinator of the Master and PhD Mathematics Education programmes, dpitta@ucy.ac.cy

16:50 – 17:20

- Live streaming of courses.

B. External Evaluation Committee (EEC)

<i>Name</i>	<i>Position</i>	<i>University</i>
Ruhama Even	Professor	Weizmann Institute of Science
Minna Hannula-Sormunen	Professor	University of Turku
Stanislaw Schukajlow	Professor	University of Münster
Yiannis Ppillis	Student representative	Cyprus University of Technology
Name	Position	University
Name	Position	University

C. Guidelines on content and structure of the report

- *The external evaluation report follows the structure of assessment areas.*
- *At the beginning of each assessment area there is a box presenting:*
 - (a) sub-areas*
 - (b) standards which are relevant to the European Standards and Guidelines (ESG)*
 - (c) some questions that EEC may find useful.*
- *The questions aim at facilitating the understanding of each assessment area and at illustrating the range of topics covered by the standards.*
- *Under each assessment area, it is important to provide information regarding the compliance with the requirements of each sub-area. In particular, the following must be included:*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

- *The EEC should state the compliance for each sub-area (Non-compliant, Partially compliant, Compliant), which must be in agreement with everything stated in the report. It is pointed out that, in the case of standards that cannot be applied due to the status of the HEI and/or of the programme of study, N/A (= Not Applicable) should be noted.*
- *The EEC should state the conclusions and final remarks regarding the programme of study as a whole.*
- **The report may also address other issues which the EEC finds relevant.**

1. Study programme and study programme's design and development (ESG 1.1, 1.2, 1.7, 1.8, 1.9)

Sub-areas

- 1.1 Policy for quality assurance**
- 1.2 Design, approval, on-going monitoring and review**
- 1.3 Public information**
- 1.4 Information management**

1.1 Policy for quality assurance

Standards

- *Policy for quality assurance of the programme of study:*
 - *has a formal status and is publicly available*
 - *supports the organisation of the quality assurance system through appropriate structures, regulations and processes*
 - *supports teaching, administrative staff and students to take on their responsibilities in quality assurance*
 - *ensures academic integrity and freedom and is vigilant against academic fraud*
 - *guards against intolerance of any kind or discrimination against the students or staff*
 - *supports the involvement of external stakeholders*

1.2 Design, approval, on-going monitoring and review

Standards

- *The programme of study:*
 - *is designed with overall programme objectives that are in line with the institutional strategy and have explicit intended learning outcomes*
 - *is designed by involving students and other stakeholders*
 - *benefits from external expertise*
 - *reflects the four purposes of higher education of the Council of Europe (preparation for sustainable employment, personal development, preparation for life as active citizens in democratic societies, the development and maintenance, through teaching, learning and research, of a broad, advanced knowledge base)*
 - *is designed so that it enables smooth student progression*
 - *is designed so that the exams' and assignments' content corresponds to the level of the programme and the number of ECTS*
 - *defines the expected student workload in ECTS*
 - *includes well-structured placement opportunities where appropriate*
 - *is subject to a formal institutional approval process*

- *results in a qualification that is clearly specified and communicated, and refers to the correct level of the National Qualifications Framework for Higher Education and, consequently, to the Framework for Qualifications of the European Higher Education Area*
- *is regularly monitored in the light of the latest research in the given discipline, thus ensuring that the programme is up-to-date*
- *is periodically reviewed so that it takes into account the changing needs of society, the students' workload, progression and completion, the effectiveness of procedures for assessment of students, student expectations, needs and satisfaction in relation to the programme*
- *is reviewed and revised regularly involving students and other stakeholders*

1.3 Public information

Standards

- *Regarding the programme of study, clear, accurate, up-to date and readily accessible information is published about:*
 - *selection criteria*
 - *intended learning outcomes*
 - *qualification awarded*
 - *teaching, learning and assessment procedures*
 - *pass rates*
 - *learning opportunities available to the students*
 - *graduate employment information*

1.4 Information management

Standards

- *Information for the effective management of the programme of study is collected, monitored and analysed:*
 - *key performance indicators*
 - *profile of the student population*
 - *student progression, success and drop-out rates*
 - *students' satisfaction with their programmes*
 - *learning resources and student support available*
 - *career paths of graduates*

- *Students and staff are involved in providing and analysing information and planning follow-up activities.*

You may also consider the following questions:

- *What is the procedure for quality assurance of the programme and who is involved?*
- *Who is involved in the study programme's design and development (launching, changing, internal evaluation) and what is taken into account (strategies, the needs of society, etc.)?*
- *How/to what extent are students themselves involved in the development of the content of their studies?*
- *Please evaluate a) whether the study programme remains current and consistent with developments in society (labour market, digital technologies, etc.), and b) whether the content and objectives of the study programme are in accordance with each other?*
- *Do the content and the delivery of the programme correspond to the European Qualifications Framework (EQF)?*
- *How is coherence of the study programme ensured, i.e., logical sequence and coherence of courses? How are substantial overlaps between courses avoided? How is it ensured that the teaching staff is aware of the content and outputs of their colleagues' work within the same study programme?*
- *How does the study programme support development of the learners' general competencies (including digital literacy, foreign language skills, entrepreneurship, communication and teamwork skills)?*
- *What are the scope and objectives of the foundation courses in the study programme (where appropriate)? What are the pass rates?*
- *How long does it take a student on average to graduate? Is the graduation rate for the study programme analogous to other European programmes with similar content? What is the pass rate per course/semester?*
- ***How is it ensured that the actual student workload is in accordance with the workload expressed by ECTS?***
- *What are the opportunities for international students to participate in the study programme (courses/modules taught in a foreign language)?*
- *Is information related to the programme of study publicly available?*
- *How is the HEI evaluating the success of its graduates in the labor market? What is the feedback from graduates of the study programme on their employment and/or continuation of studies?*
- *Have the results of student feedback been analysed and taken into account, and how (e.g., when planning in-service training for the teaching staff)?*
- *What are the reasons for dropping out (voluntary withdrawal)? What has been done to reduce the number of such students?*

Findings

PA short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The policy of quality assurance of the programme of study has a formal status and is publicly available for all. It supports the organisation of the quality assurance system through appropriate structures, regulations and processes in different levels (e.g. the level of department and faculty). Policy for quality assurance of the programme of study supports teaching staff, administrative staff and students to take their responsibilities in quality assurance by offering the university staff opportunities to reflect on the strengths and limitations of their work. Students' feedback to the university staff is regularly collected. Procedures ensure academic integrity and freedom, are vigilant against academic fraud, and they guard against intolerance of any kind of discrimination against students or staff.

The programme of study is designed in a way that is in line with the strategy of the university that intends to cover relevant fields of research and prepare students for future employment. It includes the intended learning outcomes. The process of the development of the programme is organized by involving students. It benefits from external expertise which rely on outstanding colleagues from other universities (e.g. visiting professors, collaboration partners, etc.). It reflects the purposes of the Council of Europe and aims at preparing students for employment, for personal development and for life in democratic societies. The basis for this development is the broad knowledge about how teaching, learning and instruction works, how the gender gap affects life of humans, and how important equality is for the society. The design of the programme enables a smooth student progression, the content corresponds to the level of the programme. The expected workload reflected in EDTS is appropriate. The programme is well-structured. It has been approved by the formal institutional approval processes. The programme clearly meets the qualification criteria and it refers to the appropriate level of National Qualifications Framework for Higher Education (European and of Cyprus). The programme is monitored by the instructors, department and faculty, who pay attention to adjusting the programme to new trends and needs of society and research, involving students in the revision process.

Public information about the programme is available and includes selection criteria, intended learning outcomes, qualification that is awarded after finishing the programme, and the teaching, learning and assessment procedures.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The programme has a lot of strengths which cannot all be mentioned in this short summary. However, the most impressive are:

- Level of support of the teaching and administrative staff.
- Very high engagement of the teaching staff in the implementation of the standards for quality assurance system.
- High benefits through involving external experts in the programme and in suggesting how to improve it. The quality of the programme clearly benefits from that.
- Development of the system that allows a smooth students' progression through the programme. The success of the programme is reflected in the very low (3%) dropout rates.
- High qualification of the students who finished the programme. Absolvents of the PhD programme take central positions in the Ministry of Education and in research. This demonstrates that the programme works very well. Finishing of the programme increases chances to become a high-level employment in the future.
- Evaluation system implemented in the programme. This system combines face-to-face evaluation through the interviews during and after the courses and a summative assessment via standardised questionnaires.

- Teaching staff put great efforts into improvement of the programme according to new research findings and new demands on the labour market.
- Communication of the selection criteria, intended learning outcomes and learning opportunities.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

The success of the programme can be better communicated to the public. For example, we did not find information about the pass rate of the programme, which when presented to us by the coordinators of the programme, were very impressive. The organizers can, for example, consider offering short videos that make visible the goals of the programme. This may help to recruit more students to the programme in the future.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
1.1	Policy for quality assurance	Compliant
1.2	Design, approval, on-going monitoring and review	Compliant
1.3	Public information	Compliant
1.4	Information management	Compliant

2. Student – centred learning, teaching and assessment (ESG 1.3)

Sub-areas

2.1 Process of teaching and learning and student-centred teaching methodology

2.2 Practical training

2.3 Student assessment

2.1 Process of teaching and learning and student-centred teaching methodology

Standards

- *The process of teaching and learning supports students' individual and social development.*
- *The process of teaching and learning is flexible, considers different modes of delivery, where appropriate, uses a variety of pedagogical methods and facilitates the achievement of planned learning outcomes.*
- *Students are encouraged to take an active role in creating the learning process.*
- *The implementation of student-centered learning and teaching encourages a sense of autonomy in the learner, while ensuring adequate guidance and support from the teacher.*
- *Teaching methods, tools and material used in teaching are modern, effective, support the use of modern educational technologies and are regularly updated.*
- *Mutual respect within the learner-teacher relationship is promoted.*
- *The implementation of student-centred learning and teaching respects and attends to the diversity of students and their needs, enabling flexible learning paths.*
- *Appropriate procedures for dealing with students' complaints regarding the process of teaching and learning are set.*

2.2 Practical training

Standards

- *Practical and theoretical studies are interconnected.*
- *The organisation and the content of practical training, if applicable, support achievement of planned learning outcomes and meet the needs of the stakeholders.*

2.3 Student assessment

Standards

- *Assessment is consistent, fairly applied to all students and carried out in accordance with the stated procedures.*
- *Assessment is appropriate, transparent, objective and supports the development of the learner.*

- *The criteria for the method of assessment, as well as criteria for marking, are published in advance.*
- *Assessment allows students to demonstrate the extent to which the intended learning outcomes have been achieved. Students are given feedback, which, if necessary, is linked to advice on the learning process.*
- *Assessment, where possible, is carried out by more than one examiner.*
- *A formal procedure for student appeals is in place.*
- *Assessors are familiar with existing testing and examination methods and receive support in developing their own skills in this field.*
- *The regulations for assessment take into account mitigating circumstances.*

You may also consider the following questions:

- *How is it monitored that the teaching staff base their teaching and assessment methods on objectives and intended learning outcomes? Provide samples of examination papers (if available).*
- *How are students' different abilities, learning needs and learning opportunities taken into consideration when conducting educational activities?*
- *How is the development of students' general competencies (including digital skills) supported in educational activities?*
- *How is it ensured that innovative teaching methods, learning environments and learning aids that support learning are diverse and used in educational activities?*
- *Is the teaching staff using new technology in order to make the teaching process more effective?*
- *How is it ensured that theory and practice are interconnected in teaching and learning?*
- *How is practical training organised (finding practical training positions, guidelines for practical training, supervision, reporting, feedback, etc.)? What role does practical training have in achieving the objectives of the study programme? What is student feedback on the content and arrangement of practical training?*
- ***Are students actively involved in research? How is student involvement in research set up?***
- *How is supervision of student research papers (seminar papers, projects, theses, etc.) organised?*
- ***Do students' assessments correspond to the European Qualifications Framework (EQF)?***
- *How are the assessment methods chosen and to what extent do students get supportive feedback on their academic progress during their studies?*
- *How is the objectivity and relevance of student assessment ensured (assessment of the degree of achievement of the intended learning outcomes)?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

All standards related to student-centred learning, teaching and assessment are met.

The programme offers a range of opportunities for students to learn and develop as school teachers, researchers, curriculum developers and decisions makers at various administrative positions. It does so through seminars, discussions, lectures and conference participation. Special attention is given in the programme to analyzing current research and its implications for educational and curriculum programs. Modern educational technologies are used in the programme and they are regularly updated. The coordinators of the programme emphasized in their presentations that the programme is flexible and adjustments are often made in course readings and assignments in order to meet individual students' needs, backgrounds and interests. Students' autonomy is encouraged by giving the opportunity to choose the topics on which they work at seminars and especially by the encouragement and the impressive support given to students to present their work at national and international conferences.

The programme aims at developing students' theoretical knowledge, understanding and professional specialization in mathematics education and developing their research skills in mathematics teaching and learning. As such, practical training centers on the practice of doing research. This kind of practical training is comprehensively provided for the students, guiding and closely mentoring students at the different stages of conducting research. In addition, the coordinators of the programs stressed that all students are offered the opportunities to reflect on theoretical approaches and their implications for instruction. Special attention is paid to analyzing current research and its implications for educational and curriculum programs, thus preparing programme graduates for curriculum development and for various decision-making roles related to mathematics education in the educational system.

Descriptions of courses are published and they include detailed information regarding course purpose and objectives, learning outcomes, prerequisites, course content including weekly schedule, and the way assessment is conducted. Review of the written information about course assessment suggests that assessment means and criteria are appropriate, transparent and support the development of the learner.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

- Adjustments made in course readings and assignments in order to meet individual students' needs, backgrounds and interests, for example, for students with degree in mathematics and secondary school teachers.
- The extensive support and encouragement given by faculty members to students to present their work in conferences and to publish it in academic journals.
- More than 40 master and PhD students' publications have been published in journals, among them lead journals in the field of mathematics education: *Educational Studies in Mathematics*, *Journal of Mathematical Behavior*, *Mathematical Thinking and Learning*, and *International Journal of Science and Mathematics Education*.
- More than 150 master and PhD students' publications have been published in conference proceedings, among them lead conferences in the field of mathematics education: PME and CERME.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

- The quality of the programme offered to students with background in primary education, which are the vast majority of participants in the programme, is of high quality. Yet, with more emphasis on aspects relevant for secondary school teaching of mathematics, the programme might be more attractive to secondary school mathematics teachers or math graduates. For example, offering courses that centre on key aspects of mathematics, such as, modelling, and courses that focus on research related to the teaching and learning of central mathematical topics in the secondary school curriculum, such as, algebra and geometry.
- Similarly, pre-primary math education, or early mathematical development does not get much attention in the contents of the programme, or in the number of students participating in the programme. Most recent developments in early mathematics education are reachable online, and these online sources could well be utilised in the programme (Eg., <https://earlymath.erikson.edu/> or <https://learningtrajectories.org/>)
- The form currently used for collecting students' feedback on courses does not provide students with the opportunity to evaluate their own contribution to learning in the course. We recommend adding a section to the form with self-evaluation of their own effort, input and self-directed learning activities during the course.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
2.1	Process of teaching and learning and student-centred teaching methodology	Compliant
2.2	Practical training	Compliant
2.3	Student assessment	Compliant

3. Teaching staff (ESG 1.5)

Sub-areas

3.1 Teaching staff recruitment and development

3.2 Teaching staff number and status

3.3 Synergies of teaching and research

3.1 Teaching staff recruitment and development

Standards

- *Institutions ensure the competence of their teaching staff.*
- *Fair, transparent and clear processes for the recruitment and development of the teaching staff are set up.*
- *Teaching staff qualifications are adequate to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.*
- *The teaching staff is regularly engaged in professional and teaching-skills training and development.*
- *Promotion of the teaching staff takes into account the quality of their teaching, their research activity, the development of their teaching skills and their mobility.*
- *Innovation in teaching methods and the use of new technologies is encouraged.*
- *Conditions of employment that recognise the importance of teaching are followed.*
- *Recognised visiting teaching staff participates in teaching the study programme.*

3.2 Teaching staff number and status

Standards

- *The number of the teaching staff is adequate to support the programme of study.*
- *The teaching staff status (rank, full/part time) is appropriate to offer a quality programme of study.*
- *Visiting staff number does not exceed the number of the permanent staff.*

3.3 Synergies of teaching and research

Standards

- *The teaching staff collaborate in the fields of teaching and research within the HEI and with partners outside (practitioners in their fields, employers, and staff members at other HEIs in Cyprus or abroad).*
- *Scholarly activity to strengthen the link between education and research is encouraged.*
- *The teaching staff publications are within the discipline.*

- *Teaching staff studies and publications are closely related to the programme's courses.*
- *The allocation of teaching hours compared to the time for research activity is appropriate.*

You may also consider the following questions:

- *How are the members of the teaching staff supported with regard to the development of their teaching skills? How is feedback given to members of the teaching staff regarding their teaching results and teaching skills?*
- *How is the teaching performance assessed? How does their teaching performance affect their remuneration, evaluation and/or selection?*
- *Is teaching connected with research?*
- *Does the HEI involve visiting teaching staff from other HEIs in Cyprus and abroad?*
- *What is the number, workload, qualifications and status of the teaching staff (rank, full/part timers)?*
- *Is student evaluation conducted on the teaching staff? If yes, have the results of student feedback been analysed and taken into account, and how (e.g., when planning in-service training for the teaching staff)?*

Findings

Standards concerning the competence, recruitment and development of teaching staff are clearly met. Teaching staff qualifications are adequate to achieve the objectives and planned learning outcomes of the study programme. The teaching staff is regularly engaged in professional and teaching-skills training and development, for example, via the support and evaluation from Centre for Teaching and Learning (CTL), and continuous gathering of student feedback in the courses. Promotion of the teaching staff takes adequately into account the quality of their teaching, their research activity, the development of their teaching skills and their mobility. Innovation in teaching methods and the use of new technologies is encouraged, staff member's own research is clearly visible in their courses and enables demonstration of linkages across research and practice well. Conditions of employment that recognise the importance of teaching are followed. Recognised visiting teaching staff participates in teaching the study programme.

The number of the teaching staff is adequate to support the programme of study. The teaching staff status (rank, full/part time) is appropriate to offer a quality programme of study. Visiting staff number does not exceed the number of the permanent staff.

Standards in the synergies of teaching and research are met exceptionally well. The teaching staff collaborate in the fields of teaching and research within the HEI and with partners outside (practitioners in their fields, employers, and staff members at other HEIs in Cyprus or abroad). Scholarly activity to strengthen the link between education and research is encouraged and clearly visible in the accomplishments of the staff in many areas of research and practice of mathematics education. Large proportion of the teaching staff publications are within the discipline, but also within closely related STEM and educational disciplines and they are sufficiently related to the programme's courses. Based on the information provided, exact allocation of teaching hours compared to the time for research activity is not known for the staff members, thus this is not evaluated.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The department has been successful in recruiting staff with great deal of international experience from top-level universities, which seems to lead to excellent level of scientific accomplishments. Their scientific research and teaching are exceptionally well-linked to the development of national curriculum and mathematics education materials as well as consultation of academic staff in the Ministry of Education. The staff has been very successful in getting international project funding for their research. Recent research of academic staff has been incorporated in teaching, while visiting scholars and research seminars with students allow following the recent developments in the field of mathematics education well. All staff submits yearly reports of their accomplishments, which represents an equal and effective strategy of the department in following the work and progress of the staff. The staff includes good combination of more senior and junior members, and they have opportunity for sabbatical, as well as participation in international collaboration and conferences.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

- The department could consider utilizing more of the recent developments in high-level online courses, materials and conferences available. This would enable students' and staff participation in conferences and high-level online events with little or no extra cost.
- It is not entirely clear how much workload each staff member has in teaching, research and administrative work, but it would be important at the department level, to keep on making sure the staff maintains well-being and work-life balance and receives support in handling pressures of various academic evaluations also in the future.
- The staff could possibly use of more support in guiding students in academic writing and language skills from the university, considering students' active involvement in international conferences and learning materials in English. Some universities offer mentoring for staff members. This could be considered at the department, whether the staff would benefit from this kind of support in the future.
- The EEC could not find information concerning studies about research ethics and open science policies, which would be important topics for the programme.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
3.1	Teaching staff recruitment and development	Compliant
3.2	Teaching staff number and status	Compliant
3.3	Synergies of teaching and research	Compliant

4. Student admission, progression, recognition and certification (ESG 1.4)

Sub-areas

- 4.1 Student admission, processes and criteria
- 4.2 Student progression
- 4.3 Student recognition
- 4.4 Student certification

4.1 Student admission, processes and criteria

Standards

- *Pre-defined and published regulations regarding student admission are in place.*
- *Access policies, admission processes and criteria are implemented consistently and in a transparent manner.*

4.2 Student progression

Standards

- *Pre-defined and published regulations regarding student progression are in place.*
- *Processes and tools to collect, monitor and act on information on student progression, are in place.*

4.3 Student recognition

Standards

- *Pre-defined and published regulations regarding student recognition are in place.*
- *Fair recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning, are essential components for ensuring the students' progress in their studies, while promoting mobility.*
- *Appropriate recognition procedures are in place that rely on:*
 - *institutional practice for recognition being in line with the principles of the Lisbon Recognition Convention*
 - *cooperation with other institutions, quality assurance agencies and the national ENIC/NARIC centre with a view to ensuring coherent recognition across the country*

4.4 Student certification

Standards

- *Pre-defined and published regulations regarding student certification are in place.*
- *Students receive certification explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.*

You may also consider the following questions:

- *Are the admission requirements for the study programme appropriate? How is the students' prior preparation/education assessed (including the level of international students, for example)?*
- *How is the procedure of recognition for prior learning and work experience ensured, including recognition of study results acquired at foreign higher education institutions?*
- *Is the certification of the HEI accompanied by a diploma supplement, which is in line with European and international standards?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

Pre-defined and published regulations regarding student admission are in place. Access policies, admission processes and criteria are implemented adequately. Pre-defined and published regulations regarding student progression are in place, with the exception of the progress in PhD research studies, which seems to be quite vaguely described. Processes and tools to collect, monitor and act on information on student progression, are in place. Pre-defined and published regulations regarding student recognition are in place. Fair recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning, are essential components for ensuring the students' progress in their studies, while promoting mobility. In the EEC material package received, there seems not to be information regarding to specifics about institutional practice for recognition being in line with the principles of the Lisbon Recognition Convention and cooperation with other institutions, quality assurance agencies and the national ENIC/NARIC centre with a view to ensuring coherent recognition across the country.

Pre-defined and published regulations regarding student certification are in place. Students receive certification explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

Overall, student admission, progression, recognition and certification are taken care of adequately. Electronical Platform used seems to be useful tool in gathering and providing detailed information about enrolment, ECTS, progress, personal details and final marks. The interviews used to make sure the candidates with their qualifications and future goals fit to the programme and staff profiles.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

The EEC would recommend special emphasis on advertisement of the programme and recruitment of the students due to excellent quality of the programme and its top-level results. This especially due to slight decrease of incoming students in the last years.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
4.1	Student admission, processes and criteria	Compliant
4.2	Student progression	Compliant
4.3	Student recognition	Compliant
4.4	Student certification	Compliant

5. Learning resources and student support (ESG 1.6)

Sub-areas

5.1 Teaching and Learning resources

5.2 Physical resources

5.3 Human support resources

5.4 Student support

5.1 Teaching and Learning resources

Standards

- *Adequate and readily accessible teaching and learning resources (teaching and learning environments, materials, aids and equipment) are provided to students and support the achievement of objectives in the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose.*
- *Student-centred learning and flexible modes of learning and teaching, are taken into account when allocating, planning and providing the learning resources.*

5.2 Physical resources

Standards

- *Physical resources, i.e. premises, libraries, study facilities, IT infrastructure, are adequate to support the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose and students are informed about the services available to them.*

5.3 Human support resources

Standards

- *Human support resources, i.e. tutors/mentors, counsellors, other advisers, qualified administrative staff, are adequate to support the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose and students are informed about the services available to them.*

5.4 Student support

Standards

- *Student support is provided covering the needs of a diverse student population, such as mature, part-time, employed and international students and students with special needs.*
- *Students are informed about the services available to them.*
- *Student-centred learning and flexible modes of learning and teaching, are taken into account when allocating, planning and providing student support.*
- *Students' mobility within and across higher education systems is encouraged and supported.*

You may also consider the following questions:

- *Evaluate the supply of teaching materials and equipment (including teaching labs, expendable materials, etc.), the condition of classrooms, adequacy of financial resources to conduct the study programme and achieve its objectives. What needs to be supplemented/ improved?*
- *What is the feedback from the teaching staff on the availability of teaching materials, classrooms, etc.?*
- *Are the resources in accordance with actual (changing) needs and contemporary requirements? How is the effectiveness of using resources ensured?*
- *What are the resource-related trends and future risks (risks arising from changing numbers of students, obsolescence of teaching equipment, etc.)? How are these trends taken into account and how are the risks mitigated?*
- *Evaluate student feedback on support services. Based on student feedback, which support services (including information flow, counselling) need further development?*
- *How is student learning within the standard period of study supported (student counselling, flexibility of the study programme, etc.)?*
- *How students' special needs are considered (different capabilities, different levels of academic preparation, special needs due to physical disabilities, etc.)?*
- *How is student mobility being supported?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The department provides adequate and readily accessible teaching and learning resources (e.g. materials, aids, equipment etc.) to students. Teaching and learning resources, both physically and virtually, are available to students via a very well-resourced library. Students can also order, if needed, new material such as specialized tests (e.g. Naglieri tests, Cognitive style tests etc.) Access to teaching and learning resources is also facilitated by appropriate technical and IT support.

Furthermore, physical resources are adequate to support the study programs. The department has a clear commitment to meeting the needs of current and future learners, as indicated by a willingness to expand resources and acquire their own building in the future.

The staff resources for student support include an appropriate range of tutors and well-qualified administrative staff. The Academic Affairs and Student Welfare Service seems to be a very useful and complete service to support the students during their learning.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

- Overall resources and support of the studies are of a good level
- Suitable books and reputable journals supporting the programme
- Strong administrative support (e.g. psychological support, support for mature, part-time, or students with difficulties, Erasmus mobility programs etc.) across the programme

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

- Staff was positive about teaching materials and classrooms, but not so positive about the location of the facilities. A unified department would be a good move to improve physical facilities.
- Through the online meeting with a number of representatives of both Master's and PhD's students and graduates, the committee came to the conclusion that they do not seem comfortable in speaking and communicating in English, a skill that is crucial for a future academics to possess. Based on that, we recommend that there should be more focus and approach on supporting students' academic English skills both in spoken and written form throughout the programme.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
5.1	Teaching and Learning resources	Compliant
5.2	Physical resources	Compliant
5.3	Human support resources	Compliant
5.4	Student support	Compliant

6. Additional for doctoral programmes (ALL ESG)

Sub-areas

6.1 Selection criteria and requirements

6.2 Proposal and dissertation

6.3 Supervision and committees

6.1 Selection criteria and requirements

Standards

- *Specific criteria that the potential students need to meet for admission in the programme, as well as how the selection procedures are made, are defined.*
- *The following requirements of the doctoral degree programme are analysed and published:*
 - *the stages of completion*
 - *the minimum and maximum time of completing the programme*
 - *the examinations*
 - *the procedures for supporting and accepting the student's proposal*
 - *the criteria for obtaining the Ph.D. degree*

6.2 Proposal and dissertation

Standards

- *Specific and clear guidelines for the writing of the proposal and the dissertation are set regarding:*
 - *the chapters that are contained*
 - *the system used for the presentation of each chapter, sub-chapters and bibliography*
 - *the minimum word limit*
 - *the binding, the cover page and the prologue pages, including the pages supporting the authenticity, originality and importance of the dissertation, as well as the reference to the committee for the final evaluation*
- *There is a plagiarism check system. Information is provided on the detection of plagiarism and the consequences in case of such misconduct.*
- *The process of submitting the dissertation to the university library is set.*

6.3 Supervision and committees

Standards

- *The composition, the procedure and the criteria for the formation of the advisory committee (to whom the doctoral student submits the research proposal) are determined.*
- *The composition, the procedure and the criteria for the formation of the examining committee (to whom the doctoral student defends his/her dissertation), are determined.*
- *The duties of the supervisor-chairperson and the other members of the advisory committee towards the student are determined and include:*
 - *regular meetings*
 - *reports per semester and feedback from supervisors*
 - *support for writing research papers*

- *participation in conferences*
- *The number of doctoral students that each chairperson supervises at the same time are determined.*

You may also consider the following questions:

- *How is the scientific quality of the PhD thesis ensured?*
- *Is there a link between the doctoral programmes of study and the society? What is the value of the obtained degree outside academia and in the labour market?*
- *Can you please provide us with some dissertation samples?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The programme for obtaining a PhD degree is very well prepared and fulfil all standards and requirements. Clear criteria future students need to meet (e.g. quality of academic career, prior achievement, ability of developing independent critical thinking) and the selection procedure are well defined. The requirements of the doctoral degree programme are carefully prepared by the authorities and they are accessible for future doctoral students. They include the stages of completion, time needed to complete the programme, examinations, courses that have to be completed (compulsory and elective), and details on the preparation, submission and obtaining the PhD degree.

Students are guided through the preparation courses (so called research stages courses) that allow a close collaboration between the students and their consulting supervisors about the expectations regarding the PhD thesis. After that, the writing stages ensure a continuous progress in students' writing process. We did not find specific guidelines about the steps of progress, etc, which we believe is an appropriate approach, as decisions about the length of each chapter and other specific details should be made based on the research topic and they cannot be set in a general way. The University uses a plagiarism software in order to ensure the originality of the work and students are informed about it. However, we could not locate any information about research ethics taught in the programme. This is an important content for PhD studies. There is a standardized procedure regarding the way the dissertation should be submitted.

The supervision of the dissertation is guaranteed on the very high quality. The composition, procedure and criteria for the formation of the advisory and examination committees are regulated through the department, faculty and university policy. The supervisors, and if needed the other members of the advisory committee, have regular meetings with the doctoral students. Doctoral students receive feedback on their research and get strong support from their supervisors. Participation in conferences is an important part of the qualification. The supervisors encourage students to submit research reports to national and international conferences and they strongly support the research process in every stage of the development of the research report. Indeed, all PhD students participate in conferences during their doctoral programme.

Strengths

A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

- High professional level of the teaching staff. All course instructors have an exceptional experience in research and in teaching. They publish papers in the best journals in mathematics education and also influence educational practice in Cyprus. Thus, they can be excellent role models for the PhD students.
- Structure and content of the courses. The courses cover all essential parts that PhD students need for conducting research in an appropriate way. The courses (1) refer to the theory of mathematics education and theory in related subjects (e.g. Education or Educational Psychology), (2) include analysis of the state of the art of contemporary research in mathematics education, and (3) help to identify research gaps. Further, the courses prepare students for using research methodology in qualitative and quantitative research on high level (e.g., grounded theory, action research, multi-level modelling, IRT-models).
- The idea of research stage courses and writing courses. The research stage courses allow dealing in a flexible way with the individual progress of students while working on their proposal. Similarly, writing courses offer the opportunity to share difficulties and demands on the written part of research papers and doctoral dissertation.
- Including a seminar by external experts into the programme. The seminar offered by an external expert from another country allows valuable new insights into the educational system, research and teaching practice from outside of Cyprus. Because of that, PhD students have an excellent opportunity to reflect on their own teaching and research experience and improve their personal skills and professional development.
- Offering an opportunity to participate at international conferences. Students have a strong support from the department for participation in international conferences, which is essential for their progress in research and teaching. By submitting, for example, a proposal for a Research Report at PME (Psychology in Mathematics Education) they get acquainted with a submission process, demands on the research, reviews, and finally with presenting their research to a wide scientific audience. Further, this enable them to communicate with researchers from all over the world. Thus, participating at international conferences address well the goals of the programme at the individual level (professional development) and at the general level of the four purposes of higher education of the Council of Europe (e.g., preparing to their life as citizens in democratic societies).
- Orientation toward international research. Although the programme is offered in Greek, the programme is based on international research on key concepts in mathematics education. The teaching staff ensures the international character of the programme by (1) selecting students who have suitable knowledge in English, (2) base their courses on research published in English, encouraging students to read and analyse report studies in English, and (3) support students during the writing process by giving them feedback on their writing, on using scientific language, etc.
- Opportunities for following individual interests. The programme demonstrates in an exceptional way how autonomy and guiding of students can be realized. On the one hand, students are welcome to choose a research area that is of interest to them. On the other hand, the supervisors guide their PhD students through the very demanding process of developing a proposal, conducting the research, and writing the dissertation.

Areas of improvement and recommendations

A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

The EEC noticed quite substantial discrepancy between English language skills in the descriptions of requirements from students in the written documents provided to us and the actual performance of (former) and current students of the programme when the EEC met with them. The programme relies on English learning materials. Thus, special emphasis on supporting students' English skills in relevant language and concepts for mathematics education literature and practice would be recommended throughout the courses of the programme both in written and in spoken forms.

Please select what is appropriate for each of the following sub-areas:

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
6.1	Selection criteria and requirements	Compliant
6.2	Proposal and dissertation	Compliant
6.3	Supervision and committees	Compliant

D. Conclusions and final remarks

Please provide constructive conclusions and final remarks which may form the basis upon which improvements of the quality of the programme of study under review may be achieved, with emphasis on the correspondence with the EQF.

The PhD programme is fully compliant with the demands for such programmes. It fulfils all the standards and requirements formulated in the ESG and EQF. We would like to underline the high quality of the teaching staff. The achievements in teaching and research refer to (a) successful recruitment of the staff, (b) getting European funding for research, (c) publishing in high-impact journals, and (d) the international opportunities and connections provided to the PhD students. Furthermore, the department is linked very strongly to the educational practice in primary schools in the country.

We see the following areas that could benefit from careful attention and consideration: (1) adding more emphasis on specific mathematical content in the description of the courses, (2) covering all levels of the educational levels from early childhood to secondary school, (3) giving more support for academic language skills, and (4) allocating office spaces for PhD students.

Finally, the Committee was impressed with the quality, dedication, and energy of the faculty members responsible for the PhD programme in mathematics education we evaluated. The programme and its graduates reflect well on the University of Cyprus and are a source of strength for the State of Cyprus.

E. Signatures of the EEC

Name	Signature
Ruhama Even	
Minna Hannula-Sormunen	
Stanislaw Schukajlow	
Yiannis Ppillis	

Date: November 25, 2020