Agentur für Qualitätssicherung und Akkreditierung Austria

Expert report on the accreditation procedure for the Joint Master's Programme *GRACE* (*Gamified Reality Applications for Real-World Challenges and Experiences*) by St. Pölten University of Applied Sciences, Saxion University of Applied Sciences, and Vidzeme University of Applied Sciences, conducted in St. Pölten (AT), Enschede (NL), Valmiera (LV)

pursuant to the European Approach for Quality Assurance of Joint Programmes

Vienna, 18.12.2024

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List of Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
E³UDRES²	Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions
EHEA	European Higher Education Area
EQF	European Qualifications Framework
ESG	Standards and Guidelines for Quality Assurance in the EHEA
GRACE	Gamified Reality Applications for Real-World Challenges and Experiences
SAXION	Saxion University of Applied Sciences (The Netherlands)
SER	Self-evaluation Report
STPUAS	St. Pölten University of Applied Sciences (Austria)
TRL	Technology Readiness Level
VIDZEME	Vidzeme University of Applied Sciences (Latvia)
VR	Virtual Reality
XR	Extended Reality

1   Overview of the accreditation procedure

Consortium coordinator:

Information on the applicant institution	
Applicant institution	St. Pölten University of Applied Sciences
Sites of the higher education institution	St. Pölten, Mauer (Austria)
Legal status	Gesellschaft mit beschränkter Haftung
Initial institutional accreditation	1996/97
Number of students	3250
Accredited study programmes	26

Consortium partners:

Information on the partner higher education institution	
Name & Country	Saxion University of Applied Sciences (The Netherlands), Vidzeme University of Applied Sciences (Latvia)

Information on the accreditation application	
Programme title	GRACE - Gamified Reality Applications for Real-World Challenges and Experiences
Type of study programme	Joint Master Programme
ECTS credit points	120
Standard duration of studies	4 semesters
Planned number of students per academic year	25
Academic degree	Master of Science (MSc)
Organizational form	Full-time
Language/s	English
Sites of the study programme	St. Pölten (AT), Enschede (NL), Valmiera (LV)
Tuition fee	363,36 Euro (for students from third countries: 1.500 Euro) plus Students' Union (ÖH) fee

The applicant institution submitted the accreditation application on 23.02.2024. According to the decisions from the Board of AQ Austria on 18.09.2024 and on 02.10.2024, the following experts were nominated for this procedure:

Name	Function and Institution	Area of competence
FH-Prof. Josef Schinwald, MSc	Professorship at University of Applied Sciences Salzburg (Austria)	Realtime Art & Visual Effects, Animation, Creative Technologies
Ieva Šlēziņa, MD, MBA	Director of Medical Education Technology Centre, Rīga Stradiņš University (Latvia)	Simulation-based programs for healthcare students and professionals using full body patient simulators, manikins, task trainers, immersive rooms, VR/AR and 3D printed solutions
Anne Marleen Olthof, MSc	PhD-researcher University of Amsterdam (The Netherlands) & University of Antwerp (Belgium), Lecturer Amsterdam University of Applied Sciences (The Netherlands) Visiting Lecturer, Fachhochschule Kufstein (Austria)	Designing with the Body XR, mixed reality technology, integration of Artistic and Design Research
Kevin Stadler, PhD	Student at University of Applied Arts Vienna (Austria)	Diploma programme Media Arts; completed BSc Software & Information Engineering (Vienna University of Technology), MSc Speech & Language Processing (University of Edinburgh, UK), PhD Linguistics & English Language (University of Edinburgh, UK)

On 05.11.2024, a site visit on the applicant institution's premises took place in St. Pölten (AT).

2 Preliminary remarks

The review panel expresses its appreciation for the collaborative and well-coordinated efforts of the Consortium during the accreditation process and onsite visit. The panel acknowledges the extensive preparatory work undertaken by the Consortium, which reflects a clear commitment to ensuring the success and sustainability of the joint degree programme "GRACE" between St. Pölten University of Applied Sciences (STPUAS), Saxion University of Applied Sciences (SAXION), and Vidzeme University of Applied Sciences (VIDZEME). The site visit, hosted by STPUAS, was particularly noteworthy for its comprehensive participation from the applicant side, demonstrating substantial engagement with the programme.

The E³UDRES² (Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions) initiative is of particular relevance to the GRACE programme, given that both are committed to fostering innovation, interdisciplinary learning and regional development. The E³UDRES² initiative emphasises the importance of fostering collaboration across European academic institutions in order to address regional challenges through the implementation of innovative, sustainable solutions. Additionally, it places a strong emphasis on the promotion of entrepreneurial skills among students and researchers. This is in accordance with the objectives of GRACE, which are to combine the technological, creative, and sustainability-driven expertise of its partner universities in order to equip students with practical, real-world competencies. It is of particular interest to the review panel that the GRACE programme has been developed as part of a larger effort within the E³UDRES² network of universities to collaborate in terms of resources, knowledge, and specialisations. Furthermore, this networked approach offers resilience, as in the unlikely event of one partner being unable to continue in the programme, another E³UDRES² institution could assume responsibility, ensuring continuity and maintaining the programme's collaborative, interdisciplinary essence. By participating in a programme that embraces E³UDRES² values, GRACE students benefit from a curriculum that not only addresses regional needs but also prepares them to make impactful contributions to sustainable development across Europe.

The review panel has given its endorsement to the proposed submission of GRACE as an Erasmus Mundus programme, on the grounds of the experience of the stakeholders in supporting a mobile student body. Erasmus Mundus status would enhance GRACE's appeal to international students by facilitating mobility across partner institutions, allowing students to benefit from diverse academic and cultural experiences. This recognition would also provide crucial financial support, including scholarships, promoting inclusivity and diversity within the programme. Aligning with the goals of the Erasmus Mundus programme, GRACE would reinforce its commitment to collaborative European education and interdisciplinary learning, making it an attractive option for students globally.

The site visit was instrumental in addressing a significant number of questions that had remained open following the self-evaluation. During the on-site visit different more major and some minor issues were discussed and could be resolved in St.Pölten on the spot or through supplementary documents provided afterwards. Concerning some minor issues, the review panel gives recommendations in this report it considers beneficial to help the Consortium make GRACE even more well-rounded and future proof.

The review panel was informed during the on-site visit that the further development and coordination between the participating institutions, which at times presented significant

deviations from the self-evaluation report, had taken place as recently as the day before the on-site visit of the review panel. This further coordination resulted in relevant additional information on topics like financing, resources, organisational structures and coordination of learning outcomes. Despite this, it should be positively noted that these developments contributed to improvements and provided further clarity on outstanding questions. Throughout the interviews, it became clear that that a few issues of assessment and flow of information between different boards of the organisation were not completely resolved and needed some further discussion between the Consortium partners.

With regard to VIDZEME the review panel was informed that the university has not yet completed the requisite national licensing process. The vice-rector of Vidzeme University of Applied Sciences has convincingly argued that this will be resolved in time for the Board of AQ Austria to make its final decision.

The review panel would like to commend the Consortium for its comprehensive documentation and transparent approach, which greatly facilitated the evaluation process. The involvement of various stakeholders, including academic staff, administrative personnel, and students, demonstrated the inclusive nature of the programme's development.

In summary, the review panel is satisfied with the site visit and acknowledges the Consortium's substantial progress and readiness for the accreditation process. The commitment to collaboration, transparency, and adherence to quality assurance principles provides a solid foundation for the successful implementation of the joint degree programme.

3 Assessment and evaluation pursuant to Standards for Quality Assurance of Joint Programmes in the EHEA

3.1 1. Eligibility

1.1 Status: The institutions that offer a joint programme should[1] be recognised as higher education institutions by the relevant authorities of their countries. Their respective national legal frameworks should enable them to participate in the joint programme and, if applicable, to award a joint degree. The institutions awarding the degree(s) should ensure that the degree(s) belong to the higher education degree systems of the countries in which they are based.

[1] The Standards use of the common English usage of "should" which has the connotation of prescription and compliance.

Review Panel assessment: The standard is met.

Statement

The review panel received all the necessary information concerning this standard. Based on the information provided in the self-evaluation report (SER), in additional documents submitted prior to the site visit, and during the on-site interviews, the review panel can conclude that the three participating universities meet the basic prerequisites for participation in this programme.

- The Consortium universities have provided proof of accreditation and are officially recognized and registered as higher education institutions by the relevant authorities of their countries.

- The partner universities are entitled, according to their respective national legal frameworks, to participate in a joint master programme, allowing for the European Approach to be embedded, partially or in full. All partner universities adhere to both national regulations and European standards, and carry out procedures according to binding rules and criteria that adhere to the principles of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). For STPUAS, this is coordinated by the Agency for Quality Assurance and Accreditation Austria (AQ Austria). For SAXION, this is coordinated by the Dutch-Flemish Accreditation Organisation (NVAO). For VIDZEME, this is coordinated by the Quality Agency for Higher Education Latvia (AIKA). Study programmes are developed using the vision of external stakeholders, and correspond to the defined learning outcomes which comply with the Latvian and European Qualifications Framework.

All three universities are entitled to issue a degree that belongs to the higher education degree systems of the respective countries. Upon successful completion of the program, the student is awarded a MSc degree jointly issued by the three universities. In addition to the Master's Certificate, each graduate also receives a Transcript of Records and a Diploma Supplement.

> 1.2 Joint design and delivery: The joint programme should be offered jointly, involving all cooperating institutions in the design and delivery of the programme.

Review Panel assessment: The standard is met.

Statement

In general, the review panel learned from the SER and supplementary documents submitted by the Consortium as well as from discussions held during the site visit that the GRACE programme is a joint endeavour of all the participating universities. Particularly from the SER, the review panel concludes that STPUAS, SAXION, and VIDZEME share a common vision about the future of higher education in a European context, which is supported by their respective European University Alliance E³UDRES² memberships.

The GRACE study programme is a joint master's programme, which involves a joint governance structure that translates to a programme that has been developed jointly, will be taught jointly and assessed jointly (at least in the final exam). The existing strong collaboration of STPUAS, SAXION, and VIDZEME has emerged from previous small-scale joint initiatives, such as bootcamps, hackatons and modules in the context of gamification for XR and the context of health, smart industries, education, and related fields. These joint initiatives have led to an awareness of commonalities, expertise and shared ambition to create a joint curriculum together. In the SER, the Consortium stated that the GRACE joint master programme and its integrated mobility concept emphasizes the 'multi-university campus across Europe'. On-site conversations with the representatives of the Board and Programme Management confirmed a dedication to promoting attractiveness and openness to further developments in innovation and entrepreneurship within European higher education. For example, it was mentioned that the GRACE initiative offers each institute greater visibility in the European context towards the goal of a European multi-university campus. During the site visit, conversations with the representatives of the Executive Board and Project Management of STPUAS, SAXION, and

VIDZEME revealed a shared dedication towards the development of knowledge, skills and intercultural competences that potentially can establish innovation and entrepreneurship in the European context. The representatives also highlighted the geographic context shared by the three institutions: All three are situated in small- and medium-sized cities, whilst also being not far away from the main capitals of their respective countries and neighbouring countries. The proximity of urban and regional qualities provides opportunities for GRACE to support the development of regional settings that are future-proof, and offer the best possible quality of life for citizens in a progressive European society. The SER addresses the notion of a European multi-university campus, in which the E³UDRES² mission to closely work together and collaborate in the fields of research, teaching, innovation is explained. In the SER, the aim to distribute the students evenly among the three partner universities has resulted in an integrated mobility concept. GRACE students will transfer countries every semester, starting in Austria, then The Netherlands and finally Latvia. The review panel learned during the site visit that the representatives showed a clear vision and practical implementation regarding housing, for instance by reserving dorm room facilities of the universities. All Consortium partners take on a shared responsibility when housing or relocating becomes an issue, and the international offices are in contact with each other about this. In case of emergencies or worst-case scenarios, the representatives take a shared responsibility to enable students to finish the degree.

The global context of future challenges has led to the motivation to apply for the Erasmus Joint Master's Programme (EMJM) and to involve Erasmus Mundus for developing partnerships with underrepresented EU Member States and third countries. The SER addresses intercultural competence, as well as a demand for highly qualified IT students in the industry, which has led to a joint strive to look for ways to facilitate non-EU students to take part in the GRACE programme. The separate universities of STPUAS, SAXION, and VIDZEME are experienced in dealing with international visa-arrangements and procedures, which can take quite some time. The Consortium understands the necessity to take care of procedural visa-arrangements, in particular for the facilitation of Erasmus Mundus (non-EU) students. The SER states that the date of commencement of the programme will be announced a minimum of eight months prior to registration. On-site conversations with the representatives of the Board and Programme Management confirmed that the deadline for the current registration (when starting the programme in September 2025) is February 1st, 2025. During the on-site visit, the Consortium stated their intention to set up a joint international office dedicated to GRACE, in particular to support any future enrollments through the Erasmus Mundus programme, as well as to provide pre-enrollment interaction modes (the ability to ask questions at a forum, or connect mentors to prospective students).

Recommendations

The review panel recommends that the Consortium pursue their stated intention to establish a joint international office with the objective of optimising programme operations and providing enhanced support for staff and students.

The review panel suggests developing a strategic risk management plan for *potential risks and worst-case scenarios* in the geopolitical context, clearly defining roles and responsibilities when these scenarios occur. The main aims of this recommendation are (1) to ensure effective management, decision-making, and adherence to the programme's goals, and (2) inform and

support the students, teachers, and programme coordination team (PCT) beforehand about the procedures that can be expected.

1.3 Cooperation Agreement: The terms and conditions of the joint programme should be laid down in a cooperation agreement. The agreement should in particular cover the following issues:

- Denomination of the degree(s) awarded in the programme
- Coordination and responsibilities of the partners involved regarding management and financial organisation (including funding, sharing of costs and income etc.)
- Admission and selection procedures for students
- Mobility of students and teachers
- Examination regulations, student assessment methods, recognition of credits and degree awarding procedures in the consortium.

Review Panel assessment: The standard is met.

Statement

As part of the self-evaluation report, the Consortium submitted a comprehensive partnership & cooperation agreement based on the DESCA Model Consortium Agreement for Horizon Europe (version 1, December 2021). During the on-site visit, the experts asked for clarification on a number of open questions, particularly regarding the Consortium's Governance Framework. Due to the continuous development of the GRACE programme, particular aspects of the terms and conditions had further developed and the information that was present in the SER needed to be updated. Additional documents on governance structure, finance, student admission and selection, and student onboarding were requested. The review panel has received additional documents after the on-site visit, which contains all the necessary information concerning this standard. The review panel learned during the site visit that all universities and its representatives take on a shared responsibility towards the programme.

- The review panel found from the SER that the **denomination of the degree(s) awarded** in the programme is covered in the Partnership & Cooperation Agreement for GRACE (Gamified Reality Applications for Real-World Challenges and Experiences) and was fully explained and clarified during the site visit. The degrees that are awarded for the GRACE programme are nationally recognized by all participating countries as 'Master of Science (MSc)', at EQF level 7. All universities carry out procedures according to binding rules and criteria that adhere to the principles of the Standards and Guidelines for Quality Assurance (ESG) in the European Higher Education Area. SAXION adheres to both national regulations and European standards, which is coordinated by the Dutch-Flemish Accreditation Organisation (NVAO). The participating universities are entitled to issue a degree that belongs to the higher education degree systems of the respective countries. For GRACE, the three institutions will jointly issue a Master of Science (MSc) degree, which the review panel understands to also satisfy the legal requirements of each of the three countries.

- During the on-site interviews, the representatives of the executive management clarified the **coordination and responsibilities of the partners involved regarding management and financial organisation**. The review panel learned from the

additional documentation that the governance model of the Joint Master's Programme GRACE is a multi-tiered structure that oversees the strategic, operational, and quality assurance aspects of the programme. It comprises several boards and committees, each with clearly defined roles and responsibilities, aimed at ensuring effective management, decision-making, and adherence to the programme's goals.

Role of Consortium Partners
- GRACE relies on active participation and collaboration between its three partner institutions:
  St. Pölten University of Applied Sciences (STPUAS) acts as the coordinator of the programme, responsible for programme-wide communication, reporting, and overall management;
- *Saxion University of Applied Sciences* (SAXION);
- *Vidzeme University of Applied Sciences* (VIDZEME).

Key elements of the **governance framework** include (see also Figure 1):

Programme Coordination Team (PCT): Responsible for overall programme coordination, strategic alignment, and operational management. This local operational team acts consists of professionals within the separate universities and ensures that the programme aligns the programme content, ensures the mobility of students and faculty, and promotes a joint educational experience. It also makes sure that learning outcomes and teaching matches across all three partner institutions and gives suggestions to the Academic Directors Board.

- *Academic Directors Board (ADB)*: Serves as the primary decision-making body, with equal representation from all Consortium partners.

- *Board of Module Coordinators (BMC)*: Ensures consistency and quality across all module areas offered within the programme:

  - Path to Reality (coordinating AD from STPUAS)

  - Design & Innovation (coordinating lecturer from SAXION)

  - Didactics & Gamification (coordinating lecturer from SAXION)

  - Development & Implementation (coordinating lecturer from VIDZEME)

  - Evaluation & Dissemination (coordinating lecturer from STPUAS)

- *Quality Assurance Board (QAB)*: Focuses on quality assurance and continuous improvement, incorporating feedback from various stakeholders.

- *Advisory Board (AB)*: Provides industry and academic insights to guide the programme's strategic direction.

- *Board of Students (BS)*: Consists of one students for each Consortium partner and represents student interests and contributes to learner-centred approaches.
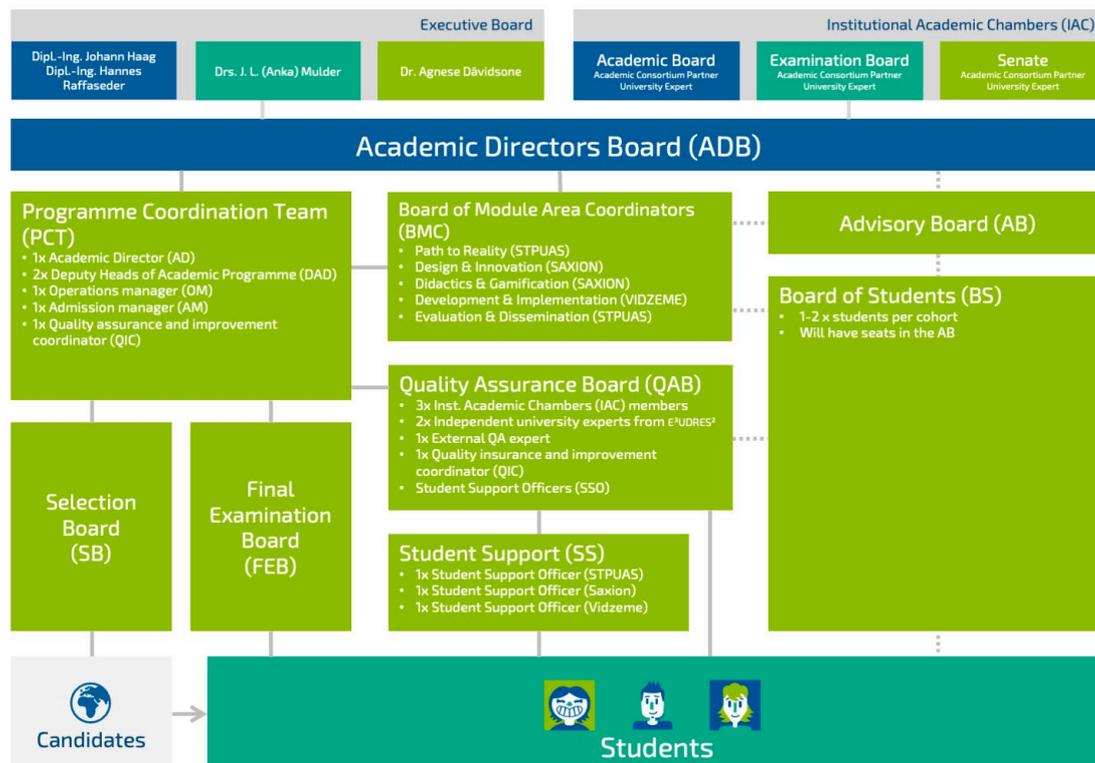
Figure 1 Governance structure of the Joint Master's Program GRACE

Each partner institution shares responsibility for ensuring that the programme as a whole meets its academic, administrative, and strategic goals. The institutions also cooperate to align programme content, to ensure mobility of students and faculty, and to promote a joint educational experience. The review panel found from the SER, the site visit and additional documentation that the coordination and responsibilities of the partners involved regarding management is fully covered.

- The review panel learned from the SER, from the site visit and from additional documents that the executive board of GRACE is designated to be the decision-maker of the **financial organisation**, the financial administrator and all financial matters by GRACE. The review panel found from the SER that the financial organization was provided through a multi-annual 'financial plan' with details concerning the financing of the joint programme from the academic year 2024/2025 until the academic year 2028/2029. The calculations of the study programme are based on the assigned study places, and the financing includes number of semester hours offered (ASWS) regarding the study places, employment costs for the course of the programme through full-time teaching, part-time teaching and research/administration, and an overview of the investments, logistics and organizational expenses.

On-site conversations with the representatives of the executive management have shown the insight and knowledge about the financial organisation, as well as the responsibilities of the Consortium partners for the financial organisation. In the eyes of the review panel, the basic requisites for the financial organisation are met, and the operational execution is in development.

- The review panel learned from the SER, from the site visit and from additional documentation that the **admission and selection** procedures for students are fully covered under the 'Admission and Recognition' in SER, and were further elaborated on in the 'Student Admission Guide' submitted following the on-site visit. The review panel learned through the SER and during the interviews that the Consortium has well-defined specific eligibility criteria for selection and admission, such as:

  - o Bachelor of Science or a Bachelor of Engineering degree or an equivalent university diploma in Game Development, Game Design, Creative Computing, Digital Games, Information Technology, Multimedia Technology, Computer Science in Real-Time Interactive Simulation, Extended Reality, Expanded Reality, AR/VR/XR Development & Design, or XR Design.

  - o Applicants whose native language is not English or whose undergraduate instruction was not in English must demonstrate proficiency in English by the application deadline, as stated in the 'Admission Guide for Students'. Equivalent alternatives may be considered upon request.

  - o The recognition of prior learning will be decided on an individual basis and applicants need to demonstrate their academic background and knowledge by providing the predefined list of documents (e.g. copy of Bachelor's degree, academic records, portfolio, personal motivational letter, recommendation letters, personal video), specified in the 'Admission Guide for Students'. Additionally, students can optionally include details of their work experience, of which preference will be given to qualified applicants who also possess relevant professional experience.

The review panel verified during the site visit and additional documentation from the 'Student Admission Guide' that a well-defined admission and selection procedure (e.g. eligibility check and review by the Selection Board, scoring system, motivation, interviews, notification of results) is in place. After admission, the students are guided through enrolment, including any necessary visa applications, housing arrangements, and orientation details.

- The review panel found from the SER and the interviews with the representatives of all universities during the site visit that the Consortium has taken comprehensive preperations for the **mobility of students and teachers**. STPUAS serves as host university during the first semester; SAXION during the second semester and VIDZEME during the third semester. All universities deliver tailored services through their respective international relations offices to help with cultural integration, housing, and navigating the complexities of international travel and residence requirements. With regard to housing and the transferring to another country in general, the review panel found the SER underscore the practicality of relocating students to another country for at least three times. During the site visit, the Consortium representatives elaborated on the practical implementation of student housing, for instance by allocating rooms in the dormitories of the universities. The review panel also learned during the site visit that all partner universities take on a shared responsibility if problems arise with housing or relocating, and the international relations offices are in contact with each other on this topic. Furthermore, the review panel concludes that student mobility is carefully incorporated into the curriculum.

  According to the SER, staff mobility programmes are designed to encourage faculty and administrative staff exchanges to enhance the international perspectives. The teaching staff can contact international relations offices of their home institutions (faculties, departments) with questions regarding all aspects of their (Erasmus+ funded) stay abroad.

- The review panel found that the **examination regulations, student assessment methods, recognition of credits and degree awarding procedures** are fully covered and well explained under the 'Examination and Student's Assessments Regulations' (annex 8) of the SER. All modules and courses in the semesters are designed in accordance with national norms. Moreover, the review panel found that the course and module examinations are organized under the responsibility and regulations of each GRACE partner university, based on a Consortium agreement to recognize each other's conventions. The allocation of ECTS points is described in the SER and supplementary documents provided to the review panel. The review panel recognizes that the Consortium has established that the recognition of courses with 2.5 ECTS taken at SAXION will not pose any legal obstacles for issuing the joint degree on the side of VIDZEME (who, according to Latvian regulations, cannot themselves run courses with fractional ECTS).

Recommendations

The review panel recommends the formulation of KPI-based (key performance indicators) strategic plan for monitoring objectives of the programme, encompassing financial planning for Erasmus Mundus grants, student participation costs (e.g. partner and programme countries) . Furthermore, it suggests the implementation of regular updates and reviews of the cooperation agreement to address procedural or structural changes in governance, finances, and student support, thereby ensuring alignment with programme objectives and regulatory requirements.

3.2   2. Learning Outcomes

> 2.1 Level [ESG 1.2]: The intended learning outcomes should align with the corresponding level in the Framework for Qualifications in the European Higher Education Area (FQ-EHEA), as well as the applicable national qualifications framework(s).

Review Panel assessment: The standard is met.

Statement

The GRACE Joint Master's Degree programme aims to offer a highly specialized knowledge and skills in the application of gamification for XR solutions in the context of Health, Smart industries, Education, and related fields to solve the real-life challenges.

The review panel learned from the SER, and discussions during the site visit provided further corroborating evidence, that the GRACE curriculum aligns with the European Higher Education Area's qualifications framework. Graduates will have specialized knowledge at the forefront of XR technologies. The programme combines profound knowledge and advanced skills regarding XR technological solutions (programming/coding, audio, visual tools, AI, 3D modelling etc.) with design thinking, a gamification approach, a focus on problem-solving, and entrepreneurial competences. In addition, the curriculum also takes into account UN Sustainable Development Goals. The programme is designed to address the whole range of complexities and unpredictabilities of modern professional environments, beginning with field research and industry needs analysis to the development of innovative projects to solve real-life problems.

From the review panel's point of view, the interdisciplinarity of the programme exists also in different focus areas of XR solutions' applicability to health, smart industries, education and related fields dealing with learning, training, maintenance, and therapeutic interventions. As demonstrated in the SER and further supported during on-site meetings with Consortium staff, the GRACE curriculum merges theoretical knowledge with hands-on expertise. The programme also integrates the Technology Readiness Levels (TRL) framework as standardized system developed by the European Commission to assess the maturity and readiness of technological innovations. In addition, the joint delivery of the programme by three universities located in three different countries ensures that students enrolled in GRACE are also exposed to a multicultural study environment, thus gaining intercultural competence as additional value.

The review panel has also found in the SER and during on-site discussions that all three partner universities have many years of experience in developing, accrediting, and conducting bachelor's programmes (EQF 6) and master's programmes (EQF 7). VIDZEME additionally offers a graduate programme (EQF 8) in the field of XR. Therefore, the rationale behind the development of GRACE as a joint master's programme was to provide an option for educational continuity to the graduates of the Consortium's partner universities to specialize and acquire additional qualifications in relevant subject areas.

The GRACE master programme has a standard duration of 4 semesters and a workload of 120 ECTS credits based on the EQF and NQF requirements according to level 7.

> 2.2 Disciplinary field: The intended learning outcomes should comprise knowledge, skills, and competencies in the respective disciplinary field(s).

Review Panel assessment: The standard is met.

Statement

In its SER, the Consortium reports that there is currently a lack of specialised master programmes on XR that also incorporate aspects of gamification, and game technologies. In addition, during the on-site visit, the Consortium representatives cited a study by the European Commission which indicates an increasing demand for skilled XR professionals on the job market, especially in key areas such as health, industry, education, and sustainability.

To address this situation, the Consortiums has designed a joint Master of Science programme for graduates with a background in computer science and game development. The new programme focuses on XR gamification-based learning applications to help graduates develop innovative products for future markets.

From the review panel's point of view, the GRACE programme shows a strong dedication to training future professionals in designing and implementing evidence-based XR gamified applications. These applications address challenges in healthcare, smart manufacturing, and education, promoting sustainable solutions for society.

The SER describes **professional, methodological, social**, and **personal competences** to be acquired during the GRACE programme. To advance **professional knowledge and competences**, students focus on technologies and tools for designing XR-gamification applications.

Methodological competences are gained through scientific writing and expertise in research design.

Social competences are strengthened through promoting collaboration in interdisciplinary teams with colleagues, industry professionals, research institutions, and entrepreneurial networks thus allowing students to develop a comprehensive understanding of the needs and perspectives of various stakeholders.

Regarding development of **personal competences**, students are encouraged to adopt an open attitude towards innovative approaches and problem-solving.

From the review panel's point of view, the GRACE curriculum offers a balanced amount of technical and entrepreneurial study courses that support the following learning outcomes (as stated in the SER):

- **Design & Innovation** (e.g. innovations & creative problem solving, design & implementation of XR Learning experiences, agile software life cycle),
- **Didactics & Gamification** (e.g. media based instructional design, principles of gamification design, business strategy for gamification solutions),
- **Development & Implementation** (e.g. object-oriented programming, audio for XR, XR hardware, mobile and web-based XR solutions, advanced 3D modelling within interactive environments),
- **Evaluation & Dissemination** (e.g. research design, scientific writing, scientific publications and knowledge transfer, usability and experience evaluation).

Furthermore, the review panel is convinced that the integration of the so-called 'bootcamp' and the 'hackathon' into the curriculum greatly adds to students' competences, complementing theoretical knowledge and practical skills gained during the other study courses.

Moreover, discussions during the on-site visit strongly supported the review panel's view that the learning outcomes and the whole design of GRACE embody the added value coming from its joint delivery. The Consortium is able to successfully unite the distinctive competences of each partner university: STPUAS with its extensive state-of-the-art equippment and laboratories as well as strong standing in applied research, SAXION with its special focus on creativity, design thinking and prototyping, and VIDZEME contributes extensive expertise in computing, XR, and industry engagement.

Based on all the evidence available, the review panel concludes that the GRACE programme provides adequate learning outcomes in the field of XR gamification-based designing, developing, and prototyping to address real-life challenges with new technologies and an entrepreneurial mindset.

> 2.3 Achievement [ESG 1.2]: The programme should be able to demonstrate that the intended learning outcomes are achieved.

Review Panel assessment: The standard is met.

Statement

The GRACE programme aims to equip students with advanced competences in XR technologies, designing, and prototyping to cover the full life cycle of product development. The review panel has been able to ascertain that the aim and intended learning outcomes of GRACE are clearly addressed in the design of the programme and its curriculum.

The review panel identified the so-called 'Path to Reality' concept to constitute the core element of the GRACE Master's programme thus providing consequent stages of the individual project development regarding to expected outcomes for each semester, e.g Expose, Low-Fi Prototype, High-Fi Prototype. It guides students through the key stages of project/product development, starting from idea generation and project definition (**Exposé stage** in the 1st semester), moving on through various stages of **Low-fidelity prototyping** (2nd semester) to **High-fidelity prototyping** (3rd semester). In the 4th and final semester, the 'Path to Reality' module culminates in a finished project and its scientific evaluation (Master's thesis). In combination with the GRACE admission requirements, which requests students to have quite a technical background, the review panel sees a discrepance in the linear setup of the 'Path to Reality', in particular for the development of prototyping skills. The GRACE programme integrates two different orientations for design and development:

1. *design thinking* orientation, oriented towards mapping contextual and behavioral needs of users and 'wicked problems', using a reflective orientation and methodological approach for project definition and idea generation. High-fidelity prototyping skills are usually not embedded in this orientation.
2. *agile development orientation*, driven towards iteratively solving the problem, and using 'trial-and-error' approach and high-fidelity prototyping from the start of the development process. Evaluation is done through software testing (performance, compatibility, security, etc.) and testing with end users.

Although Design Thinking and Agile Development are not necessarily incompatible, the students can potentially get confused if they work only on idea generation and project definition during the Exposé stage, in particular when they are used to an 'agile-driven process' of development, and have access to the vast amount of lab-facilities at STPUAS in the first semester. Since the curriculum is still in development, the review panel is convinced that this discrepance can be overcome by the Consortium. The joint delivery of the GRACE programme ensures that the level of complexity of prototyping increases with each semester and that the facilities available at each partner university support this level-up process through its different technological stages.

In addition, the SER presents the didactics behind the 'Path to Reality' along **three parallel learning paths**:

Learning Path 1: Communication and Collaboration with Industry/Business - focuses on the communication and collaboration skills needed for successful interaction with industry or business stakeholders promoting interdisciplinary teamwork.

Learning Path 2: Design, Prototyping and Implementation - involves understanding the principles and best practices in AR, VR, and mobile applications, designing low- fidelity and high-fidelity prototypes, and implementing these designs into a working prototype, according to Technology Readiness Levels (TRL) mentioned before.

Learning Path 3: Social Personal Communication and Team Working - focus on working effectively in diverse teams and communicate efficiently with fellow students and other

professionals from different disciplines, promoting a respectful and inclusive working environment.

Another perspective which the review panel finds valuable in terms of specific outcomes of GRACE are the three areas of focus – **healthcare**, **smart industries**, and **education**.

To reflect the variety of perspectives open to GRACE students after graduation, the Consortium has developed a persona (a fictional representations of a target user or a group of users) for each of the three main areas of application:

- 'Kim', specialising in health and healthcare applications, focuses on VR exergames to improve medical treatments
- 'Jamie', specialising in XR environments for smart engineering apps, ensures the seamless integration of XR technologies into industrial processes
- 'Morgan', focusing on sustainable development, raises environmental awareness by employing gamified XR experiences in the NGO sector

Although the User Experience approach helps to demonstrate outcomes and achievements of graduates, the review panel finds the description of each persona rather vague and lacking detail with regards to 'Path to Reality'. In addition, a persona with a dedicated academic career is missing, as discussed with and acknowledged by Consortium representatives during the on-site visit.

During the on-site visit, Consortium representatives explained to the review panel that in order to address real-life challenges and industry needs, the GRACE programme offers close collaboration and engagement with international industry players throughout all semesters.

The review panel also considers the GRACE mentorship model to be a critical and supportive element to guide students throughout their project development. Mentorship is provided, firstly, in-house as lecturers from the Consortium extend their roles to mentors supporting students' career and personal growth. Secondly, consultation and advisory activities are also provided externally in close collaboration with mentors from stakeholder companies. As mentioned in the SER, the mentorship scheme provides 7-10 mentors from industry for each domain (smart industry, healthcare, and education).

According to the review panel, the documentation provided by the Consortium clearly establishes that at the end of the programme, the following deliverables are expected from successful graduates :

- presentation of the individual project – a gamified XR application solving the real-life challenge in chosen field of interest (health, smart industries, education)
- submitted and defended Master thesis supporting development of the individual project and explaining methodological approach and research done for it
- passing the examination discussion on contents relevant to the curriculum such as the study portfolio.

The review panel is confident that the completion of these items strongly supports the whole design and intended outcome of the GRACE programme.

In addition, as presented in the SER and emphasized during the on-site visit, building up a "multi-university campus across Europe" was stated as extra-curricular study goal for the

programme. During the on-site visit, both the faculty of the programme as well as the student participants, enthusiastically emphasized that studying abroad plays a significant role in fostering personal growth by expanding one's worldview and cultivating open-mindedness. Immersed in a new culture, students encounter different perspectives, traditions, and ways of thinking, which encourages them to question and broaden their own beliefs and assumptions. This exposure helps individuals become more adaptable, empathetic, and culturally aware, qualities that contribute to a more open-minded approach in all aspects of life. Professionally, studying abroad also provides unique advantages in shaping one's career path. Experiencing a new educational system, meeting international professionals, and even interning or working in a foreign country gives students a diverse set of skills and knowledge that can be valuable in the international job market. By navigating different cultural and professional environments, GRACE students will be supported in developing essential skills such as problem-solving, cross-cultural communication, and resilience. These attributes not only enhance employability but also allow students to identify and pursue career paths that align with their expanded goals and ambitions.

Based on all evidence available, the review panel assesses that graduates of the GRACE programme will be well-equipped to meet industry needs by creating innovative XR-gamified solutions from concept to product. In order to complete this, the graduates will combine both technical and managerial competences, addressing all stages from design to dissemination. In addition, studying and working in an intercultural setting will expand students' perspectives and strengthen their resilience, preparing them for careers in the international job market.

Recommendations

The review panel recommends to engage with a non-linear setup for using methods and techniques for prototyping, or self-directed learning approach.

The inclusion of a persona representing students with academic career aspirations, such as those aiming for a PhD, would broaden the curriculum's appeal and ensure alignment with diverse student pathways.

> 2.4 Regulated Professions: If relevant for the specific joint programme, the minimum agreed training conditions specified in the European Union Directive 2005/36/EC, or relevant common trainings frameworks established under the Directive, should be taken into account.

Not applicable to GRACE.

3.3 3. Study Programme [ESG 1.2]

> 3.1 Curriculum: The structure and content of the curriculum should be fit to enable the students to achieve the intended learning outcomes.

Review Panel assessment: The standard is met.

Statement

The review panel examined the curriculum structure and content of the GRACE joint degree programme. The curriculum is designed to provide students with a comprehensive education in gamified reality applications, combining theoretical knowledge and practical experience. The review panel noted that the programme's curriculum is organised around key modules, including basic and advanced courses in XR/VR development, gamification and project-based learning.

The review panel determined that the curriculum of the GRACE programme effectively demonstrates the distinctive capabilities of each participating institution, thereby facilitating an integrated and dynamic learning experience throughout its structured semesters. St. Pölten University of Applied Sciences contributes its robust focus on technological innovation and advanced practical learning environments, which enhance the programme's hands-on approach to XR/VR development. Saxion University of Applied Sciences contributes its renowned expertise in design thinking, particularly evident in the second semester, equipping students with creative problem-solving methodologies essential for the effective management of complex projects. Furthermore, the programme benefits from robust industry connections, which facilitate the integration of real-world applications into the curriculum. Vidzeme University of Applied Sciences introduces an additional focus on sustainability, regional development, and multidisciplinary research, thereby providing a comprehensive and well-rounded educational approach.

From the perspective of the review panel, the combined efforts of the three institutions create a synergy that promotes a multifaceted learning environment. The distinctive competencies of STPUAS, SAXION, and VIDZEME are drawn upon to enrich the programme, thereby fostering educational outcomes that ensure students develop a diverse, practical, and innovative set of skills. This collaboration reinforces the programme's innovative character and commitment to interdisciplinary excellence, thereby jointly equipping students with competencies that go beyond what each university could provide on its own.

The review panel found that the 'Path to Reality' module series confers considerable advantages through the provision of a structured, progressive methodology for project development and the facilitation of practical learning. The series is designed to be completed over multiple semesters, allowing students to engage in continuous, iterative prototyping and project refinement. This approach enables students to align their theoretical knowledge with practical application over an extended period. The advantage of distributing these modules across different semesters and participating institutions is the varied expertise and unique resources each university contributes to the programme. This structure allows students to experience a variety of educational methodologies and access a broader range of facilities and mentoring styles, thereby enriching their learning journey. By capitalising on the strengths of STPUAS's technological focus, SAXION's design thinking and VIDZEME's emphasis on sustainability and interdisciplinary research, the module series ensures that students develop a comprehensive, practical skill set that reflects the collaborative and innovative nature of the GRACE programme.

The review panel noted that the curriculum provides a strong foundation in the technical and theoretical aspects necessary for the programme. However, certain imbalances were identified. For example, the prototyping phases in the 'Path to Reality' module place significant emphasis on the exposé in the first semester, which may limit early student engagement with facilities and project development. Importantly, during the on-site interviews, students expressed a strong interest in making greater use of the state-of-the-art facilities available at STPUAS during this phase in the first semester.

In addition, the panel noted that the number of ECTS credits allocated to teaching outweighed those allocated to project work, a problem acknowledged during the site visit by the Deputy Programme Director of SAXION. This imbalance may require adjustments after the first few years of the programme, as more practical experience is gained. The Consortium's intention to use other courses of the curriculum to support 'Path to Reality' projects is challenged by the need for coordination between these course contents and project requirements. A reallocation of ECTS credits to prioritise project work is therefore likely to be essential.

The structure of the curriculum also appears to be somewhat unbalanced in terms of content. The representation of gamification - a core element symbolised by the 'G' in GRACE - is limited to a single course, while other areas, such as advanced 3D and audio classes, occupy a disproportionate share of the curriculum. The Consortium argues that these classes and other structures, like the intended batch system, will provide valuable insights into various workflows relevant to GRACE's gamification content. This seems viable, but should be monitored for potential future review.

Furthermore, the timing of the third semester hackathon raises concerns. Positioned late in the curriculum, it seems unlikely to effectively influence the development of high-fidelity prototypes, given that project selection already takes place in the middle of the first semester.

Recommendations

The review panel recommends that the Consortium closely monitor the workload of the "Path to Reality" projects to collect data for a potential reallocation of ECTS credits if necessary. The focus and importance of gamification as a core aspect of the programme should be clearly communicated to students. Additionally, the timing of the hackathon could be brought forward to enhance its relevance to the development of high-fidelity prototypes. Finally, the Consortium should ensure clear and transparent communication regarding the mentoring setup to provide students with a better understanding of the available support.

> 3.2 Credits: The European Credit Transfer System (ECTS) should be applied properly and the distribution of credits should be clear.

Review Panel assessment: The standard is met.

Statement

The GRACE Joint Degree Programme awards 120 ECTS credits over four semesters, following the standards of the European Higher Education Area. The distribution includes 5 to 10 ECTS per module, with a 30 ECTS thesis module in the final semester, consisting of 28 ECTS for Project Implementation & Evaluation and 2 ECTS for the final examination.

The review panel noted that while the overall distribution of workload appears appropriate, there are a few minor imbalances in the ECTS allocation for specific courses. For example, basic courses such as 'Object-Oriented Programming' have 2 ECTS credits, which should be considered to be the minimum. Depending on prior knowledge of future students, this should be monitored to ensure it is matching the workload of the course. Similarly, the course

'Principles of Gamification Design' is allocated 2.5 ECTS credits. This allocation could potentially misrepresent the importance of gamification as one part of the core objectives of the whole programme. As clarified in the on-site visit, the course only represents a part of the gamification aspects of GRACE, which should be communicated clearly to future students.

In contrast, courses such as 'Audio for Extended Realities' and 'Advanced 3D Modelling within Interactive Environments' are allocated 3 and 6 ECTS credits respectively, which may disproportionately shift the focus away from essential core content.

The review panel also noted that the greater emphasis on classroom-based learning over project work may limit the amount of hands-on practice, particularly in the 'Path to Reality' module. Adjustments to the prioritisation of project work may be necessary as the programme evolves and more operational evidence is gathered.

Recommendations

The review panel recommends that the ECTS allocation be reviewed to ensure a more balanced focus on core programming and gamification courses and to increase the emphasis on project work.

> 3.3 Workload: A joint bachelor programme will typically amount to a total student workload of 180-240 ECTS-credits; a joint master programme will typically amount to 90-120 ECTS-credits and should not be less than 60 ECTS-credits at second cycle level (credit ranges according to the FQ-EHEA); for joint doctorates there is no credit range specified.
>
> The workload and the average time to complete the programme should be monitored.

Review Panel assessment: The standard is met.

Statement

The GRACE joint degree programme comprises 120 ECTS credits over four semesters. As stated in the Self-Evaluation Report (SER), the monitoring of student workload and the time required to complete the programme is integrated into the course evaluations and the planned student surveys. Students can contact the Student Council, the Board of Module Coordinators and the Advisory Board if they feel that the workload is not commensurate with the ECTS credits allocated.

The Review Panel found that the mechanisms for monitoring workload, including feedback through student evaluations and boards, were well structured to ensure that workload was in line with ECTS credits. This was supported by on-site evidence where students highlighted the effectiveness of these feedback channels and the documentation in the SER detailing their implementation and regular review process. This multi-level system provides clear channels for students to raise concerns and enables responsive adjustments to be made where necessary.

Recommendations

The review panel recommends continued monitoring of workload distribution to ensure it remains balanced and aligned with the programme's 120 ECTS framework. Special attention should be given to modules with intensive theoretical content or project phases, such as the 'Path to Reality' module, to ensure workload supports practical learning objectives.

3.4   4. Admission and Recognition [ESG 1.4]

> 4.1. Admission: The admission requirements and selection procedures should be appropriate in light of the programme's level and discipline.

Review Panel assessment: The standard is met.

In the self-evaluation report, the Consortium states that applicants must hold a Bachelor-level university degree in a narrow range of fields centered around Game Development, Game Design and XR technologies. Non-native speakers also require proof of proficiency in English, based either on prior attendance of an English-language institution of higher education, or based on applicants' test results on a recognized English language qualification test. The report clearly specifies all the supporting documents required to apply for admission, the website where applications are to be submitted, a deadline for the completion and submission of applications, as well as an outline of the admission and registration procedure.

The self-evaluation report describes a multi-stage selection procedure with clear division of responsibility between administrative staff, a joint Selection Board featuring representatives of all three institutions and, finally, the Consortium Committee. At the site visit, the Consortium representatives told the review panel that the point-based selection procedure used by the Selection Board is based on a procedure already in use in another joint programme run by one of the partner universities. The Consortium members also declared their intention to add an additional external member to the Selection Board. Following the site visit, the review panel was provided by the Consortium with preliminary versions of two documents which give more details regarding the selection procedure, aimed at interested students and the members of the Selection Board, respectively. The review panel examined the so-called 'Student Admission Guide' and found the description of the admission and selection procedure to be well-defined. This guide contains an overview of the admission procedure consisting of an eligibility check and a review by the Selection Board, also taking into account motivational letters and recommendation letters. On top of that, interviews can be conducted if additional information or clarification are needed. Furthermore, a transparent and standardized scoring system to assess academic performance is outlined in a document labelled 'Selection Board Guide'. Students will be notified of the results of the admission process through email. After admission, successful candidates will be guided through enrollment, including any necessary visa applications, housing arrangements, and orientation details.

From the experts' point of view, the programme demonstrates a systematic approach to evaluating student applications with regard to their academic quality, personal motivation as well as personal skills. The experts found that the formal admission requirements for both the educational background as well as the English language proficiency are appropriate given the technical level of the curriculum. The requirements of each of the necessary documents to be submitted by applicants are described in detail in the Student Admission Guide, while the Selection Board Guide provides clear guidelines for scoring the quality of each of the documents.

> 4.2. Recognition: Recognition of qualifications and of periods of studies (including recognition of prior learning) should be applied in line with the Lisbon Recognition Convention and subsidiary documents.

Review Panel assessment: The standard is met

Statement

The review panel gathered from the SER that all three Consortium partners are fully-fledged members of the European Higher Education Area (EHEA), and carry out procedures according to binding rules and criteria that adhere to the principles of the Standards and Guidelines for Quality Assurance (ESG). In the SER, the Consortium universities reaffirm the objectives of the Bologna Process and EHEA, which include the recognition of qualifications and prior learning. All three countries have ratified the Lisbon Recognition Convention and its subsidiary documents, and the provisions are applied accordingly.

The review panel learned that the recognition of prior academic performance will be decided on an individual basis. Applicants are required to demonstrate their academic background and knowledge by providing records from a predefined list (e.g. copy of Bachelor's degree, academic records, portfolio, personal motivational letter, recommendation letters, personal video), as outlined in the 'Admission Guide for Students'. Additionally, candidates can also include details of their prior work experience. If necessary, the Consortium will prefer applicants with relevant professional experience and proper documentation.

3.5   5. Learning, Teaching and Assessment [ESG 1.3]

> 5.1 Learning and teaching: The programme should be designed to correspond with the intended learning outcomes, and the learning and teaching approaches applied should be adequate to achieve those. The diversity of students and their needs should be respected and attended to, especially in view of potential different cultural backgrounds of the students.

Review Panel assessment: The standard is met.

Statement

The review panel learned in the SER that the setup of the programme is organised in four semesters around the expertise of the three Consortium partners STPUAS, SAXION and VIDZEME, and is taking place at three different locations, St. Pölten in Austria (STPUAS), Enschede in The Netherlands (SAXION) and Valmiera in Estonia (VIDZEME). During the site visit, the review panel learned that the Consortium has put in the effort to create a coherent curriculum for the Joint Programme of GRACE, which ensures a continuous improvement of teaching and assessment standards. The curriculum is work-in-progress and will evolve over time and be adapted when necessary.

In the SER, and during the site visit, the review panel detected a few possible challenges for the programme to correspond to the intended learning outcomes. We want to outline these challenges with the intention to provide suggestions for further development:

- **Identity of the programme.**

  From the SER, the review panel learned that the programme offers a variety of modules in the first semester covering topics that require in-depth expertise. But that depth is not always properly reflected in ECTS allocation. Examples are: 'applied artifical intelligence' (2 ECTS) , 'object-oriented programming' (2 ECTS), or 'audio for extended realities' (3 ECTS). In the second semester, examples are 'principles of gamification design' and 'business strategy for gamification solutions' (both 2.5 ECTS). During the site visit, the review panel learned that this setup is intended to let students broaden their horizon and apply their knowledge to different fields. Also, the curriculum is evolving and students will have more courses to choose from in the future.

- **Trouble-shooting project change**

  In the SER, the review panel learned that students will choose industry partners and work with the speciality of the stakeholders that are involved. In this context, students will work on a single project from the beginning to the end, but in practice students can run into problems or a project can become obsolete. Students can change projects, but then they have to start from scratch and bring a new project back up to the same level as the old one.

- **Academic career path**

  In regards to academic research, the review panel learned during the site visit that students will learn from other academic researchers on how to deal with research questions in the context of XR. In the conversations with the representatives of the GRACE programme, adding an academic path career 'persona' was seen as an valuable to the other three main areas of application.

Recommendations

The review panel recommends to explore the individual learning loops of students and how students make decisions in regards to the provided curriculum, to better understand the needs and wishes for interdisciplinary learning and knowledge dissemination.

The review panel recommends the Consortium to provide a dedicated trouble-shooting procedure for students when projects and collaboration with stakeholders stop or are changed over the course of the programme.

In the context of academic research, the review panel recommends the Consortium to explore the integration of industrial needs and academic research from a futuristic orientation, moving beyond the stakeholders that are present at the start of the GRACE programme, so that an outward orientation towards knowledge gaps and knowledge dissemination can be maintained over the course of the programme.

The review panel recommends the Consortium to balance formative and summative evaluation during the learning process, for instance by exploring alternative ways of learning and assessing, such as 'self-directed learning' and 'programmatic assessments'. This becomes even more relevant when interdisciplinarity becomes a strong aspect in the programme.

> 5.2 Assessment of students: The examination regulations and the assessment of the achieved learning outcomes should correspond with the intended learning outcomes. They should be applied consistently among partner institutions.

Review Panel assessment: The standard is met.

Statement

The review panel found in the SER that all GRACE students are subject to the respective examination regulations of the hosting university they are attending every semester. The Consortium partners apply their national grading system for course examination. During the site visit, the Consortium pointed out that individual teachers can design assessments on how they want to assess the learning outcomes, with an emphasis on online tests, portfolios, presentations and a mix of different types. The Consortium also explained to the review panel that the assessments have not yet been set in stone and further guidelines to teacher and students will be provided.

Final examination

Based on the VIDZEME examination regulations, progressing from the 3rd to the 4th semester is only possible when all previous courses have been completed. The final examination will be completed with an oral master's exam (thesis defence) before an examination board, consisting of a panel of five people, including:

- 1 academic from the hosting university,
- 1 additional academic committee member from another Consortium partner,
- 1 additional academic committee member of an external university from the E^{3}UDRES^2 European University Alliance
- at least 2 examiners from associated institutions/industry partners.

The final examination will consist of three independently assessed parts: First, a presentation of the Master's thesis. Second, defence and examination discussion that addresses the links between the topic of the Master's thesis and the relevant subjects of the curriculum. Finally, an examination discussion on other contents relevant to the curriculum such as the study portfolio.

Students receive basic information on course type, workload and assessment procedure in the curriculum, in the course and study management system provided by GRACE and in detail at the beginning of each course.

Recommendations

Like mentioned in the recommendations of 5.1, the review panel recommends the Consortium to balance formative and summative evaluation during the learning process, for instance by exploring alternative ways of assessing learning outcomes, such as the 'programmatic assessments'. This is also recommended when interdisciplinarity and/or a diverse group of students becomes more prominent in the student cohorts.

The review panel recommends a common grading system that includes conversion rules based on an ECTS grading table, made available to the students at the beginning of their studies. This would be particularly helpful for students who are falling behind in ECTS accumulation and need additional guidance for setting up a learning plan to move forward.

3.6   6. Student Support [ESG 1.6]

> The student support services should contribute to the achievement of the intended learning outcomes. They should take into account specific challenges of mobile students.

Review Panel assessment: The standard is met.

The self-evaluation report states that all three institutions have experienced student support offices dedicated to international students. All institutions organize language and intercultural competence programmes as well as local 'buddy systems' to ensure a soft landing of incoming students. During the on-site visit, current students of all three institutions confirmed to the review panel the presence and effectiveness of these services from the student perspective. In addition, the Programme Director of GRACE also expressed the intention to align the three different on-boarding approaches.

The self-evaluation report mentioned support for students in finding accommodation on- or off-campus. During on-site interviews, the programme directors explained to the review panel that all three institutions will be able to offer on-campus housing to all students of a cohort enrolled in the GRACE programme. To help with the relocation during the relatively short break between winter and summer semester, courses will be scheduled to stop a little earlier during the winter semesters. In turn, students will be expected to arrive on campus 1.5 weeks before the start of term, both as a safety buffer as well as to allow them to be fully settled in once courses start.

During the site visit, Consortium representatives acknowledged the particular mobility demands of students who may require multiple visas/residence permits (particularly non-EU students). They expect the first cohort of the programme to be made up of EU-students. Applications of non-EU students will also require checking that the financial situation of the students will satisfy the requirements for their visa applications. In case of a successful application to Erasmus Mundus, the Consortium plans to hire a dedicated staff member to meet the additional demands generated by supporting a large number of non-EU students.

During the site visit, the programme directors also mentioned different ways in which students can raise both their personal and study-related concerns to the institutions' local support services, as well as through the administrative structure of the Joint Programme (particularly the Board of Students). They stressed the importance of offering multiple routes to accommodate cultural differences in how students prefer to raise concerns. Current students of the three institutions confirmed to the review panel the approachability and effectiveness of raising issues of workload with the teachers and other staff at their institutions. The students of STPUAS and SAXION also described their direct perception of systematic instructor feedback procedures at their institutions, as well as their positive experiences with feedback being taken up and implemented effectively.

Following the site visit, the Consortium submitted a preliminary version of a student "Onboarding Guide" to be distributed to accepted students. This guide aims to provide detailed information on the academic, travel and visa logistics for each of the three programme locations. While the draft version of the guide available to the export panel is still fragmentary, its general outline is well-structured and, once completed, the guide would provide an important reference for supporting students in independently answering questions regarding academic as well as social life and general life logistics at each of the three programme locations.

The review panel has found that all three institutions are highly experienced in supporting the needs of mobile students, and are taking significant steps to coordinate and align their support to deliver these services jointly to the students of the programme.

Recommendation

The review panel recommends the standardisation of a regular student-to-instructor feedback process across all three institutions. (The design of this feedback process can and should bring together the strengths of the already established feedback practices of the individual institutions, such as the exemplary twice-per-semester feedback system adopted at STPUAS, which was commended by students.)

Commendation

The experts commend the Consortium's guarantee of offering on-campus housing to all students of the cohort, since this will greatly alleviate the pressure exerted by a programme with such high demands on student mobility.

3.7   7. Resources [ESG 1.5 & 1.6]

> 7.1 Staff: The staff should be sufficient and adequate (qualifications, professional and international experience) to implement the study programme.

Review Panel assessment: The standard is met.

Statement
During the site visit in St. Pölten (Austria), the panel of experts met with faculty and administrative staff from STPUAS, VIDZEME and SAXION. The panel was introduced to key members involved in the joint degree programme, including professors, lecturers and support staff responsible for the delivery and coordination of the programme.

The panel also verified the qualifications and experience of the staff through the SER provided. This included CVs, lists of research projects and publications relevant to the programme's focus on applications of gamified reality.

The review panel found that the teaching and administrative staff at all three institutions are highly qualified and bring diverse and relevant expertise to the programme. Faculty members have significant academic and industry experience in areas such as computer science, XR/VR technology, gamification and educational methodology. This blend of theoretical and practical

knowledge is a clear advantage in delivering an innovative and comprehensive educational experience.

The panel observed that the staff demonstrated a strong commitment and enthusiasm for the programme. During on-site discussions, staff members articulated clear strategies for supporting student learning, promoting research and fostering collaboration between partner institutions. In addition, the faculty's involvement in cutting-edge research projects and collaborations with industry partners enhances the practical relevance of the curriculum.

However, the panel noted that while staffing levels are generally adequate, external lecturers and industry professionals should continually be seen as a part of the knowledge transfer to further connect academia and current industry trends. Ensuring that through industry knowledge strengthens the programme's ability to be able to react to changing trends and needs within the industry effectively.

Recommendation

The review panel recommends that the Consortium consider increasing the number of external industry lecturers to reflect current industry trends and requirements. This would enhance the overall quality and future prospects of the programme content.

Commendation

The review panel congratulates the Consortium on assembling a highly qualified and committed team of faculty and staff. Their dedication and expertise are critical to the success of the programme and provide a strong foundation for future growth and sustainability.

> 7.2 Facilities: The facilities provided should be sufficient and adequate in view of the intended learning outcomes.

Review Panel assessment: The standard is met.

Statement

During the site visit, the review panel had the opportunity to examine the facilities of STPUAS, including the computer labs, seminar rooms, motion capture studio, XR/VR lab, postproduction lab, maker lab, and student study spaces. Additionally, the review panel analysed video, photo and text documentation showcasing the facilities at VIDZEME and SAXION.

The review panel found that all three institutions possess state-of-the-art facilities that are well-suited to support the learning and research needs of students enrolled in the joint degree programme. The facilities at STPUAS were particularly notable for their comprehensive range of technology and resources, including specialized labs that cater to XR/VR development, motion capture, and postproduction work. These features underscore the institution's commitment to providing an advanced educational environment.

The video documentations provided by VIDZEME and SAXION demonstrated that both institutions are similarly equipped with modern, high-quality facilities. These include dedicated spaces for student study and collaborative projects, as well as technological resources that align with the programme's focus on gamified reality applications and innovative learning approaches.

From the review panel's point of view, the combination of physical and digital resources at all three institutions is commendable and significantly enhances the learning experience. The commitment to maintaining and developing these facilities ensures that students have access to a stimulating and supportive educational environment.

Recommendations

The review panel recommends that the Consortium continues to invest in regular updates and maintenance of their facilities to keep pace with technological advancements and evolving student needs. Additionally, enhancing the accessibility of resources for remote and disabled students would further improve the inclusivity and reach of the programme.

Commendation

The review panel congratulates the Consortium on providing state-of-the-art facilities that foster a highly conducive learning and research environment. This dedication to quality infrastructure is a key strength of the joint degree programme.

3.8   8. Transparency and Documentation [ESG 1.8]

> Relevant information about the programme like admission requirements and procedures, course catalogue, examination and assessment procedures etc. should be well documented and published by taking into account specific needs of mobile students.

Review Panel assessment: The standard is met.

The self-evaluation report points to the website of the programme (https://grace.eudres.eu/) which provides information about the Consortium, its member institutions, as well as basic information about the Joint Programme. As of mid-December 2024, the website described the overall structure of the programme's five core modules, as well as giving the names of the individual classes to be taken in each semester. The overall mobility concept and timeline was explained, and the basic admission requirements (including a listing of all required documents) as well as tuition fees and application deadlines were clearly stated. No details were given about the amount or the meaning of the "Students' Union" fee. The admission requirements page mentioned that applications from third countries were currently only possible upon request, and provided the e-mail and phone details of STPUAS' student support center (CSC) as contact points for further questions.

The admission requirements page as well as the programme frontpage linked to the programme's application system, which is hosted on the existing application system infrastructure of STPUAS (https://www.fhstp.ac.at/en/study-programmes/media-digital-

technologies/gamified-reality-applications). The programme description there contained mostly the same information as the main programme website, with some more details on the mobility concept and individual modules' learning outcomes, as well as a listing of the curriculum's individual course names and ECTS in PDF format. This website also advertised the dates of online information events on the programme, as well as a contact form for getting in touch in writing.

The 'How to apply' section on this website again listed all documents required for application, and gave an overview of the selection and admission procedure. 'Apply now' leads to the actual application system where prospective students can register and upload their application documents.

Following the site visit, the consortium submitted the draft version of a "Student Admission Guide" as an additional 13-page document in PDF format. This admission guide succinctly summarises all necessary details about the application procedure (including a detailed explanation of each required document not currently found on the websites), deadlines, as well as a FAQ section covering scholarships, mobility, and other practicalities.

From the experts' point of view, the Consortium has published all information regarding the basic outline of the programme content, mobility concept and admission requirements in a clear and transparent manner. However, the review panel found that more detailed information about the content and examination modalities of individual courses, such as is contained in the self-evaluation report, has not yet been made available publicly, or only in a very rudimentary form.

Recommendations

More detailed information about the content of individual courses as well their examination modalities should be made available on the programme website.

Information about the term times of each of the 4 semesters and the required timeframes for on-campus presence for each semester should be provided online.

3.9   9. Quality Assurance [ESG 1.1 & part 1]

> The cooperating institutions should apply joint internal quality assurance processes in accordance with part one of the ESG.

Review Panel assessment: The standard is met.

Statement

The review panel found from the SER that the joint study programme GRACE has been developed along the principles of the Standards and Guidelines for Quality Assurance (ESG) in the European Higher Education Area. In addition, the guidelines and information from the European Approach for Quality Assurance for Joint Programmes standards have been followed and incorporated in the application for accreditation, the Partnership & Cooperation Agreement, the curriculum, the student's assessment regulations, as well as the guides on student selection and admission submitted after the on-site visit. The GRACE programme is integrated into the quality assurance systems of the three Consortium partners, which are higher education

institutions that carry out procedures according to binding rules and criteria that adhere to the above-mentioned common guidelines. This forms the core of the cooperation from the academic perspective, and is applied in a way that is appropriate for the context and in coordination with the strategy and profile of the individual universities.

Concerning joint internal quality assurance processes, the review panel learned from the SER, as well as interviews during the site visit, that GRACE employs a multi-tiered governance model that oversees the strategic, operational, and quality assurance aspects of the programme. An additional "Governance Structure" document submitted after the site visit provides greater detail about the purpose and responsibilities, composition and membership, decision-making authority, meeting frequency and procedures, interaction with other boards as well as key outputs and deliverables of each of the boards and committees.

The programme's central organ for internal quality assurance is the Quality Assurance Board (QAB), whose role is to monitor and improve the quality of GRACE. The QAB consists of academic representatives as well as the Student Support Officers from all three partner institutions, independent university experts from the wider E³UDRES² network, GRACE's Quality insurance and improvement coordinator (QIC), and an external quality assurance expert. The QAB meets regularly (at least twice a year in person according to the SER, only once a year with provisions for in-person meetings according to the signed Cooperation Agreement and the Governance Structure document), and is in charge of producing annual quality reports including analyses of student feedback and recommendations for improvements to the programme. Its responsibilities include further developing the quality assurance system, analysing stakeholder feedback, and addressing student complaints and suggestions. The QAB has the authority to investigate and resolve student complaints, propose quality improvements, and prepare evaluations based on student feedback. To gather the information it needs, the QAB interacts with the Institutional Academic Chambers (IAC), the Academic Directors Board (ADB), the Board of Module Area Coordinates (BMC), the Advisory Board (AB) as well as the Board of Students (BS).

In the view of the review panel, the comprehensive setup of the QAB implements a joint quality assurance process that effectively involves all partner institutions, as well as all the joint boards and committees that are part of the GRACE governance framework.

Recommendation

The review panel recommends that the Quality Assurance Board (QAB) meet at least twice a year, at least during the first cohorts of the programme when early feedback might indicate need for adjustments to the programme or the quality assurance process itself.

4 Summary and final evaluation

The review panel was highly appreciative of the open and constructive collaboration with the Consortium of the Joint Master's Programme GRACE throughout the on-site visit. The documentation provided, insights derived from the site visit, and the dedication of all stakeholders exhibited a profound commitment to the successful delivery of an innovative and

high-quality programme. The Consortium left a favourable impression on the panel, demonstrating a clear vision and effective collaboration across partner institutions.

The programme successfully integrates advanced competencies in XR technologies and gamification, providing students with a robust framework for both theoretical learning and practical application. The 'Path to Reality' module is particularly notable for its progressive structure, enabling students to experience continuous hands-on project development throughout the programme.

Furthermore, the panel found the facilities at the partner institutions to be state-of-the-art, offering students access to cutting-edge technologies and resources. To guarantee inclusivity, the panel urges the continuation of efforts to enhance accessibility for remote and disabled students. Additionally, although the Consortium has exhibited a robust dedication to collaboration, the structure for external mentoring suggests further clarification to provide more explicit guidance for students and stakeholders.

The review panel concluded that the programme meets the standards of the European Approach for Quality Assurance of Joint Programmes. The Consortium's efforts to leverage the unique strengths of each partner institution and its focus on fostering interdisciplinary learning and practical application were particularly commendable. The jointness of the approach and the resulting additional benefits that students will be able to enjoy by studying within the proposed structure of the programme is particularly worth mentioning as one of the key strengths of GRACE.

However, the panel identified areas where further refinement is recommended. It would be beneficial to adjust the timing of the hackathon to align it more closely with the development of high-fidelity prototypes. Additionally, the allocation of ECTS credits could be revised to give greater priority to project work and core gamification content. By addressing these and other recommended areas for improvement (see detailed report), the Consortium can ensure even greater impact and long-term success.

The integration of formative and summative assessments with techniques such as programmatic assessments facilitates interdisciplinary and diverse learning. Here, the implementation of a unified grading system with ECTS conversion rules would offer students requiring additional support a clear framework for progression.

The programme's alignment with E^3UDRES^2 serves to enhance its success by leveraging shared resources, expertise, and best practices across a European network. This collaboration supports interdisciplinary education, smart regional development, and entrepreneurial thinking, thereby ensuring GRACE's adaptability, resilience, and relevance in preparing students for real-world challenges. The review panel commends the Consortium for embedding the programme within such a forward-thinking initiative, which serves to significantly strengthen its impact and sustainability.

Final Assessment

The review panel unanimously recommends the accreditation of the GRACE Joint Master's Programme without conditions, acknowledging its strong adherence to the standards set forth by the European Approach and its dedication to providing a joint high-quality educational experience.

Standard	Assessment	Recommendations	Conditions
Standard 1: Eligibility			
1.1 Status	Standard is met		
1.2 Joint design and delivery	Standard is met	The review panel recommends that the Consortium pursue the establishment of a joint international office with the objective of optimising programme operations and providing enhanced support. Furthermore, the development of a strategic risk management plan to address geopolitical or institutional risks would serve to reinforce the programme's resilience.	
1.3 Cooperation Agreement	Standard is met	The review panel recommends the formulation of KPI-based (key performance indicators) strategic plan for monitoring objectives of the programme, encompassing financial planning for Erasmus Mundus grants, student participation costs (e.g. partner and programme countries) . Furthermore, it suggests the implementation of regular updates and reviews of the cooperation agreement to address procedural or structural changes in governance, finances, and student support, thereby ensuring alignment with programme objectives and regulatory requirements.	
Standard 2: Learning Outcomes			
2.1 Level	Standard is met	The standard is fulfilled as the programme aligns with EQF level 7 and national frameworks, ensuring advanced competencies.	
2.2 Disciplinary Field	Standard is met	The standard is fulfilled as the programme prepares students to create XR gamified applications in healthcare, manufacturing, and education while fostering interdisciplinary competencies through technical, entrepreneurial, and methodological courses.	
2.3 Achievement	Standard is met	The review panel recommends to engage with a non-linear setup for using methods and techniques for prototyping, or self-directed learning approach. Furthermore, the inclusion of a persona representing students with	

		academic career aspirations, such as those aiming for a PhD, would broaden the curriculum's appeal and ensure alignment with diverse student pathways.	
2.4 Regulated Professions	Not applicable		
Standard 3: Study Programmes			
3.1 Curriculum	Standard is met	The review panel recommends that the Consortium undertake a re-evaluation of the allocation of ECTS credits in order to achieve a more nuanced relation between coursework and project work, particularly within the 'Path to Reality' module. An increased emphasis on core gamification content would result in a curriculum that more closely aligns with the programme's stated objectives. The timing of the hackathon should be reconsidered, as moving it earlier in the programme could enhance its impact on high-fidelity prototype development. Furthermore, the Consortium should address the lack of structure in external mentoring and ensure that a clear, well-defined framework is in place.	
3.2 Credits	Standard is met	The review panel recommends a review of the ECTS allocation to ensure a greater emphasis on core areas such as gamification and programming, which are fundamental to the programme's objectives. An adjustment to the distribution of credits would enhance the curriculum's focus and better align it with the intended educational outcomes.	
3.3 Workload	Standard is met	The review panel recommends that the distribution of workload be monitored on an ongoing basis through the use of regular student feedback, with the objective of ensuring that it aligns with the programme's stated goals. Particular attention should be paid to modules that include intensive theoretical or practical content, such as the 'Path to Reality' module, in order to maintain an even focus between the amount of work assigned and the practical learning objectives of the programme.	
Standard 4: Admission			

and Recognition			
4.1 Admission	Standard is met	The standard is fulfilled as the programme applies a systematic and transparent admission process with clear eligibility criteria and rigorous selection procedures. This ensures that admitted students meet the high academic and professional standards required.	
4.2 Recognition	Standard is met	The standard is fulfilled as the programme follows established European frameworks for the recognition of qualifications, ensuring fair and consistent evaluation of prior academic achievements.	
Standard 5: Learning, Teaching and Assessment			
5.1 Learning and Teaching	Standard is met	The review panel recommends an investigation into students' individual learning processes and decision-making techniques, with the aim of gaining a deeper understanding of their requirements for interdisciplinary learning and knowledge dissemination. It is recommended that a troubleshooting procedure be established to address project or stakeholder issues during the programme. There is a need for greater focus on prototyping methods and their academic exploration in order to address knowledge gaps in XR. It is advised that the Consortium integrate futuristic academic research with industrial needs in order to ensure continued knowledge dissemination beyond the initial stakeholders. Additionally, it is advised that formative and summative assessments respectively be chosen, potentially through programmatic methods, as interdisciplinarity becomes more central to the programme.	
5.2 Assessment of students	Standard is met	The review panel recommends that the Consortium adopt a more varied approach to evaluation throughout the learning process by exploring alternative methods of assessing learning outcomes, such as the 'programmatic assessments' recommended in 5.1. Furthermore, this is recommended when interdisciplinary work and/or a diverse cohort of students in the GRACE programme becomes a more prominent feature. The review panel suggests the implementation of a unified grading system that incorporates	

		conversion rules based on an ECTS grading table, accessible to students at the outset of their studies. This is particularly relevant for students who are behind in ECTS and require additional guidance in formulating a learning plan to progress.	
Standard 6: Student Support	Standard is met	The review panel recommends the standardisation of a regular student-to-instructor feedback process across all three institutions.	
Standard 7: Resources			
7.1 Staff	Standard is met	The review panel recommends augmenting the participation of external industry lecturers to guarantee that the curriculum remains synchronised with contemporary trends and industry demands.	
7.2 Facilities	Standard is met	The review panel recommends that the facilities be updated and maintained on a regular basis in order to align them with technological advancements and student needs. Furthermore, it is encouraged that accessibility for remote and disabled students be improved in order to enhance inclusivity and broaden the programme's reach.	
Standard 8: Transparency and Documentation	Standard is met	The review panel recommends that the course content and assessment information be made more detailed and accessible online, including semester timelines and required on-campus presence schedules.	
Standard 9: Quality Assurance	Standard is met	The review panel recommends that the Quality Assurance Board (QAB) meet at least twice a year (at least during the first cohorts of the programme).	

The review panel **recommends** to the Board of AQ Austria the accreditation of the Joint Master's Programme *GRACE* (*Gamified Reality Applications for Real World Challenges and Experiences*) without conditions.

5 Reviewed documents

- Application for accreditation of the Joint Master's Programme GRACE, received on 23.02.2024 in the version of 10.06.2024

- Subsequent document submitted prior to the site visit, received on 29.07.2024:

  - Information on country-specific requirements (Latvia, The Netherlands) for the European Approach and on the legal status of all three partner institutions

- Subsequent documents submitted after the site visit, received on 12.11.2024:

  - Information on infrastructure and financial calculations, as well as drafts of Student Admission Guide, Selection Board Guide, Governance Structure, Onboarding Guide

- Subsequent document submitted after the site visit, received on 13.11.2024:

  - Statement on the handling of ECTS allocation