METAVERSE ACADEMY

Metaverse Academy

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Data Acquisition Methodology

Guideline for Implementation

Deliverable: 2.2

FIAP

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1. Mixed Method Research

In the social sciences, the mixed methods approach has gained prominence for its ability to provide comprehensive insights into research questions by using both quantitative and qualitative data collection and analysis techniques. The Metaverse Academy project aims to use this approach to conduct a comprehensive needs analysis and skills mapping for its target groups of students and industry stakeholders in the field of immersive technologies, with a particular focus on AR/VR/ XR. This guide outlines the methodology for implementing the mixed methods approach, including quantitative online surveys and qualitative interviews, tailored to each target group.

The mixed methods approach represents a comprehensive research methodology that integrates both quantitative and qualitative methods to investigate research questions

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from multiple perspectives, providing richer insights and a more detailed understanding of complex phenomena (Creswell & Plano Clark, 2018). By combining quantitative surveys with qualitative interviews, the Metaverse Academy project aims to utilize the strengths of both methods to gain a holistic understanding of the needs and preferences of students and industry stakeholders in the field of immersive technologies.

Quantitative surveys have the advantage of collecting numerical data from a larger sample size, allowing for statistical analysis to identify trends and patterns (Creswell & Creswell, 2017). By distributing online multiple-choice questionnaires, the project partners aim to map the profile of learners by quantifying their knowledge levels, skills and preferences in relation to AR/VR and XR technologies. This approach will provide the project team with systematic data that can be utilised for the design and implementation of educational programmes tailored to the specific needs of students.

Qualitative interviews on the other hand provide the opportunity to explore more deeply the participants' experiences, perspectives, and motivations (Guest, Namey, & Mitchell, 2013). Therefore, in addition to individual quantitative surveys for students, extensive individual and group interviews with industry stakeholders will be conducted. This helps to capture rich qualitative data that may not be easily quantifiable. Through open-ended and tailored questions that take into account experience levels, interviewers can explore participants' attitudes, challenges and aspirations in relation to immersive technologies and gain valuable insights into the industry needs.

The data collection process in the Metaverse Academy project follows an ‘explanatory sequential design’ in which quantitative data is first collected through multiple choice questionnaires completed by students. This initial phase allows for the systematic collection of data to establish county specific and overall baseline profiles and identify regional and transnational trends within the student population. Qualitative data is then collected through interviews with industry stakeholders. The interviews can take place online or on site. These qualitative interviews serve to further explain and contextualise the quantitative findings, providing deeper insights into the experiences, perspectives and motivations of the participants. By employing an explanatory sequential design, the project aims to enrich the understanding gained from the quantitative data with detailed qualitative information, facilitating a more comprehensive analysis and interpretation of the research findings.

The integration of quantitative surveys and qualitative interviews within the mixed methods approach allows for the triangulation of data, where findings from one method can be validated or complemented by findings from the other (Johnson & Onwuegbuzie, 2004). By adopting a mixed-methods approach, the Metaverse Academy

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project aims to generate comprehensive and practical insights that can support the development of the 19 educational courses in the field of immersive technologies.

2. Quantitative Online Survey

The objective of the quantitative survey instrument is, as a first step, to understand the general perceptions, preferences and experiences of students in their learning environment in relation to immersive technologies. The target sample size is 2000 participants.

2.1 Design of Multiple-Choice Online Survey for Students

The design of the multiple-choice online survey for students enrolled at a tertiary education institution of the Metaverse Academy project took into account the heterogeneity of the target group, which includes students from various countries and with different levels of experience in the use of XR technologies in their environment of learning. Based on the results of the literature reviews conducted by SABANCI and FIAP, a standardised questionnaire was not considered feasible due to the different backgrounds and experiences of the students. Therefore, a collaborative effort was made to select items from existing sources (a.o. Alvi, 2023; Al-Adwan et al., 2023; Gil-Cordero et al., 2023; Hwang & Lee, 2023; Kumar, Shankar, Behl, et al., 2023; López-Belmonte, Pozo-Sánchez, Lampropoulos, & Moreno-Guerrero, 2022; Prasetia & Aprianingsih, 2023) and develop new ones to create a short questionnaire that could effectively capture the perspectives of all students regardless of their familiarity with the technologies.

Key steps in the design process

Item selection and development: Items for the questionnaire were selected based on a thorough review of relevant literature conducted by SABANCI and FIAP. New items were also developed to meet the specific needs and objectives of the project. The aim was to create a brief questionnaire that could accommodate the diverse backgrounds and experiences of the student population.
In the consortium it was jointly decided to develop one harmonised questionnaire to ensure comparability across all countries.

It was left to the partners to decide whether to include an additional section on culture-specific questions (maximum of 5 questions). Only the South African partners made use of this, they also measured the extent to which factors such as a stable power supply, stable internet connection, access to computers and mobile devices, help users to learn

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more about the use of XR technologies

Collaborative review: The selected items were discussed with all project partners to ensure their relevance and applicability in different cultural contexts to facilitate consistency and comparability of data across international settings. The questionnaire was then finalised in English, up on the agreement of all partners.

Ethical approval: Prior to distribution, the questionnaire was reviewed by the ethics committees of the university partners to ensure compliance with ethical standards and to protect the rights and welfare of participants.

Translation: The approved questionnaire is translated into the native language by the partners in order to facilitate accessibility for the students, ensure comprehensibility and achieve a high response rate

Characteristics of the Survey

Survey Structure: The questionnaire assesses participants' experiences and perceptions regarding XR technologies and MOOCs in their academic journey to capture among other things familiarity with immersive technologies, usage patterns, perceived benefits and challenges.
The questionnaire consists of 19 questions divided into 4 main dimensions (for the complete questionnaire, see Annex 1):

(1) Demographic Data
At the beginning of the questionnaire, the following socio-demographic data are collected: Gender, country of study, educational profile, level of education and years in programme. This serves to contextualise the results. The demographic variables can be included as control variables when evaluating the data in order to enable country-specific but also group-specific analyses (e.g. distinctions between genders or study programmes) and interpretations of the survey results.

(2) Experience and Perceptions Regarding XR & MOOCs
This dimension consists of 7 multiple-choice questions which capture participants' individual experiences and opinions of XR (technologies and MOOCs. It includes questions about personal use of XR technologies, assessment of their benefits for one's country and study programme, and participation in MOOCs and their flexibility in relation to academic goals.

Mainly 5-point Likert scales and multiple-choice questions are used to assess dimensions 2 and 3.

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(3) Experience and Perceptions Regarding XR Technologies in my Field of Study
This dimension consists of 5 multiple-choice questions which assess participants' perceptions of different aspects of the use of XR technologies in their field of study. It includes perceptions of the added value of both theoretical and practical learning experiences, self-assessment of the ability to use XR technologies, relevance of different competences and self-assessment of the level of competence.

(4) Additional Comments
This section consists of 2 open-ended questions and provides participants with an opportunity to share additional comments and suggestions regarding their experiences with XR educational tools, as well as their needs as students in terms of training and development to enter the XR industry within their field of study.

Estimated completion time: Participants are expected to complete the questionnaire in approximately 15-20 minutes.

2.2 Data Collection via Online Survey

The data collection is divided into 2 phases: Firstly, there will be a short pilot of the questionnaire to check its usability, the arrangement of the items and the significance of the items in the questionnaire for statistical viability. The piloting will be limited to testing the questionnaire in Spain; it can be expected that the results will be transferable to other countries as the questionnaire development was a collaborative process.

The second phase then comprises the actual international data collection to achieve the KPIs.

Piloting/Pre-Testing: Prior to the official data collection phase, a pilot phase will be conducted under the supervision of UJI University, during which the questionnaire will be tested on clarity, relevance and effectiveness of the questionnaire with a sample of 10-15 students.
The feedback from the pilot project will be used to ensure the suitability of the questionnaire for the target group and to refine it if necessary.

In addition, a review of the translated surveys is carried out before the data collection phase according to the dual control/4-eye principle: This means that two team members per country check the final questionnaire. This ensures accuracy, clarity and consistency with the research objectives and potential errors can be minimised in advance.

Distribution & Outreach: The distribution strategy for the student survey in the Metaverse Academy project aims to reach a total of 2000 students to map their profiles, including knowledge levels, skills, and preferences related to immersive technologies.

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Each **University** needs to collect responses from **300 students**. All **other entities** need to collect responses from **100 students**. **Deadline** to reach that number will be **1st of October 2024.**

In agreement with UJI University, it has been decided that each partner will receive a link to the final approved questionnaires, translated into their respective local languages, to be integrated into the online survey tool Google Forms. Following a brief pilot phase conducted by UJIand an assessment of the questionnaire's applicability, each partner will receive a unique link in their language for sharing among students for data collection. This will allow for monitoring of surveys conducted by each partner.

The data collection phase will start before the semester break in 06/2024 and will last until End of September 2024. Depending on the response rate, the survey period can be extended after consultation with the partners.

The heterogeneity of partners ensures broad coverage and representation of diverse student groups. Partners will use a variety of channels to reach out to students and encourage them to participate in the survey. Communication channels such as (university) email newsletters, social media and learning platforms, announcements in lectures and student organisation meetings will be used to disseminate information about the survey and encourage student participation and to maximise outreach. To encourage participation, partners may offer rewards such as gift cards or vouchers for completing the survey.
Since the partners have very different approaches to the students (direct access as a university, indirect access via networks of other organisations in the project), the outreach strategies of the partners must be designed individually according to a joint pattern. For a description of the partners' individual outreach and distribution strategies, see Distribution Strategy of Student Survey)

In order to make the survey accessible, questions are translated in the local language.

By following these steps, the Metaverse Academy project aims to develop a robust tool that can effectively capture the diverse perspectives and experiences of students from different cultural and educational backgrounds, thereby informing the development of tailored educational programmes and resources in the field of immersive technologies.

Monitoring of participation: During the period of data acquisition, designated representatives of each organization will have access to monitor the progress of the survey and ensure that the KPIS are met. Using the tracking features of the online tool to monitor survey participation and response rates allows partners to initiate appropriate early strategies to increase participation and ensure a representative sample if response is low (e.g. reminder emails, posting the survey link on social media, explaining the purpose of the questionnaire and contacting students directly). The

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defined small group of people ensures monitoring on the one hand and data security on the other.

Privacy and ethics: The choice of online tool ensures that the data protection regulations and ethical guidelines of the participating organisation can be complied with. The privacy and anonymity of the participants is protected throughout the entire data collection process, right up to the analysis and publication of the results. The collected data is stored in a password-protected cloud service for a period of 5 years. Responses remain anonymous and no personally identifiable information is collected.

Data analysis and reporting: At the end of the data collection, UJI will produce a comprehensive report on the key findings and actionable insights. The report will show country-specific results as well as general conclusions, the support of the partners is required to contextualise and interpret the results of the different countries.

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3. Qualitative Interviews

In seeking to understand the demand and requirements for immersive technologies in different industries, qualitative data collection serves as a key tool.

Using qualitative interviews, we aim to assess the current state of the immersive technology market, highlighting its applications, stakeholders and implications for workforce development. By exploring the complexities of different industries, we aim to identify key players and stakeholders, explore existing uses of immersive technologies, and identify the essential skills and knowledge for immersive technologies across different industries.

By engaging with 200 industrial stakeholders (min 100 companies with 200 interviewees) through qualitative on-site interviews, we seek to uncover the skills and knowledge essential for individuals to adapt to the rapidly evolving landscape of immersive technologies.

By systematically analysing qualitative data, we intend to gain deeper insights into the demand and requirements for immersive technologies in order to tailor our educational courses and initiatives to meet the constantly changing needs of both students and industry stakeholders.

3.1 Design of Interview Guideline for Industrial Stakeholders

This guideline's objective is to assist partners in conducting interviews with industrial stakeholders to assess the demand and requirements for immersive technologies, specifically AR/VR and XR, across various sectors. These insights will inform the development of educational courses within the Metaverse Academy project.

When developing a guide for interviewing industry representatives, it is important to consider the different levels of experience with XR technologies and the diversity of industries and sectors in order to gain detailed insights and perspectives from key industry stakeholders. The qualitative interviews serve as a critical component of the Metaverse Academy project's data acquisition strategy, providing an opportunity to explore in depth the experiences, skill and knowledge needs of industry stakeholders in relation to immersive technologies.

With the implementation of the interview guidelines, we aim to analyse the current state of the market for immersive technologies in different industries and sectors. This will include identifying the key players and stakeholders in each industry, the current applications and uses of immersive technologies, and the specific skills and knowledge required for individuals to be successful in these industries and to foster industry-

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relevant educational initiatives and meaningful collaboration between academia and industry.

Key steps in the design process

In the design process led by UJI, with FIAP providing an initial set of questions based on their experience, several key steps were taken to ensure the effectiveness and relevance of the interview guidelines. First, Sabanci and UJI refined the set of interview questions provided by FIAP. The refined questionnaire was then reviewed and discussed by all project partners to ensure alignment with the project objectives and suitability across different industry sectors. In addition, consideration was given to the selection of questions to account for the different experiences and perspectives of stakeholders from different industries and sectors, particularly in relation to their engagement with immersive technologies. Through this collaborative and iterative design process, the interview guidelines were tailored to elicit comprehensive insights from industry stakeholders in different contexts.

Characteristics of the Interview

The interview for industrial stakeholders serves as an agile tool, capturing essential information while flexibly adapting to the respondent's experience with immersive technologies. Firstly, basic details such as organisation, name, position, country and industry/sector are collected to provide context for responses. In addition, at the beginning of the interview the respondent's experience with immersive technologies is assessed in order to tailor the interview accordingly.

With a total of 26 questions across 7 dimensions (Introduction & Background; Awareness of Immersive Technologies; Use of Immersive Technologies; Benefits, Challenges and Requirements; Workforce Demand and Training; Collaboration between Industry and Educational Institutions; Conclusion), the interview guideline is structured to ensure comprehensive coverage while addressing varying levels of experience with immersive technologies. Each dimension includes questions tailored to both experienced individuals and those less familiar with immersive technologies, allowing for a differentiated exploration of perspectives. Throughout the interview, it's important to ensure that questions from all dimensions are covered, although the interviewer has the flexibility to select questions based on the respondent's background and expertise from each dimension. This approach ensures a dynamic and responsive conversation that captures insights across a spectrum of immersive technology experiences and perspectives. (for the complete Interview guideline, see Annex 1):

While organizing interview forms and questions, an introduction was set out to build a trust for the interview, the first questions were organized to be answered easily, questions were ordered from private to general. Questions regarding sensitive topics

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were left to the end, questions about knowledge and experience were asked in relation with experiences, and questions regarding individual info were asked at the beginning.

Interview Design Issues: Data collection instruments consist of in-depth interviews prepared in order to collect qualitative data and semi-structured forms and instructions used in focus group meetings, and survey forms used in onsite, on the phone and online applications which have been prepared in order to collect quantitative data. The followings have been taken into consideration:

Easy-to-understand and focuses questions: Questions of the interview should be defined as explicitly and open as possible in order to be understood easily by the individual interviewed. Efforts were made not to prepare general and abstract questions and researchers organized the questions according to the individual interviewed as possible.

Asking open-ended questions: On forming the interview questions, attention was paid not to prepare predictable and short-answer questions. An important note here is not to move on to a new question once a desired answer has been given and to wait until the interviewee has finished their explanation.

Avoiding manipulation: Researchers avoided manipulative reactions to the answers apart from asking questions during the interview and giving tips to clarify the questions.

In addition to these mentioned above, necessary precautions to keep the information obtained from the interviewee confidential have been taken. The content of the information obtained has not been discussed with anyone other than the authorized and the people related with the project.

3.2 Data Collection via qualitative Interviews with Industry Stakeholder

Step by Step Guideline for the implementation

1. **Partner Selection:** Partners should aim to select a diverse range of industrial stakeholders representing different sectors such as healthcare, education, manufacturing, etc. Special consideration should be given to the size and prominence of the companies/institutions to ensure a comprehensive understanding of the market landscape. Since AR/VR/XR technologies are not yet widely used, participants may have little or no experience/knowledge. Therefore, when selecting participants, it is important to conduct a preliminary assessment and try to balance those who have experience/knowledge with those who do not. Also the interview should not be conducted with just anyone in the organization but with

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knowledgeable and authorized individuals. Preferably, interviews should be held with managers, technical staff, or participants from the training department. It is recommended to have 2 interviewees per one company, or to conduct the interview in the form of a focus group meeting to blend different perspectives within the organization.

2. **Approach and Outreach:** Partners should reach out to selected industrial stakeholders via email or phone, introducing the purpose of the interview and the relevance of their participation in shaping educational initiatives within the Metaverse Academy project. If the partner has a database of potential participants, pre-screening should be done to find out the best candidates. If possible an announcement of invitation can be done to find out participants via social media channels or e-mail distribution lists. It is important to clearly outline the benefits of their involvement, such as contributing to the development of skilled professionals in the field of immersive technologies.

3. **Scheduling and Time Allocation:** Partners should coordinate with the industrial stakeholders to schedule the interviews at mutually convenient times. Allocate sufficient time for each interview, typically ranging from 45 minutes to an hour, depending on the depth of discussion.

4. **Interview Preparation:** Partners should familiarize themselves with the objectives of the interview and the questions outlined in the interview guide. If needed tailor the questions based on the specific industry and the role of the stakeholder within their organization. Depending on the level of experience of the companies with Metaverse technologies, select the appropriate questions, ask questions, allow questions or give examples of good practice (here, for example, the country reports can be used to give the partners an idea of which technologies are available and how they can be used successfully).

5. **Conducting the Interview:** Create a conducive environment for the interview, whether it's in-person, via video conference, or onsite. Begin the interview by introducing the Metaverse Academy Project purpose and importance of their insights in shaping educational initiatives. Encourage open and honest responses by listening actively and asking for detailed information where necessary. Ensure that all suitable questions are covered within the allocated time frame while allowing flexibility for additional discussion if needed.

6. **Documentation:** Two options are available for the documentation of the interviews. The choice of the most appropriate option is at the discretion of the interviewer. The objective is to document the results in English in a format that can be analysed by UJI and used to produce a meaningful report.

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Option1: Transcription of the interviews:
It is imperative that the interviewee be informed and consent to the recording and transcription of the interview. The interview can be conducted in either English or the local language. The interview can be transcribed using automated tools, such as https://riverside.fm/, and subsequently translated into English. In addition to the English transcript, a brief summary of the most significant findings, challenges and recommendations proposed by the stakeholders should be prepared. Furthermore, it is requested that the most illustrative quotations be documented in order to be incorporated into the report, thus providing a humanising perspective.

Option 2: Creation of a comprehensive written record of the interviews
The interview can be conducted in either English or the local language.
It is essential to document the responses of the interviewees in detail within the interview guide for each question. This will ensure that no information is lost and that the information can be understood by anyone who was not present during the interview. In addition to the English detailed documentation, a brief summary of the most significant findings, challenges and recommendations proposed by the stakeholders should be prepared. Furthermore, it is requested that the most illustrative quotations be documented in order to be incorporated into the report, thus providing a humanising perspective.

7. **Follow-up & Data Confidentiality:** After the interview, partners should express gratitude to the industrial stakeholders for their time and valuable contributions and highlight again the importance of their insights in informing the development of educational courses within the Metaverse Academy project. Partners must ensure that all information obtained during the interviews is treated confidentially and used solely for the purpose of the project.
   Obtain consent from the stakeholders regarding the use of their anonymized responses for project-related documentation and analysis. After the session, transcribe the interview and share it with participants to ensure data accuracy and resonance. This process is called “member checking or respondent validation”. Get their approval before whether the transcribed notes are correct or not.

By following this comprehensive guideline, partners can effectively conduct interviews with industrial stakeholders to gather valuable insights for the needs analysis of immersive technologies within various sectors. These insights will play a crucial role in shaping the educational courses of the Metaverse Academy project.

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Annexes

Annex 1: Need Analysis: Online Survey for Students

Dear Participant,

Thank you for participating in the Metaverse-Immersive (VR/MR/XR/AR) Technology Needs Assessment Survey. You have been selected to participate in this survey because you are currently enrolled as a student at a tertiary education institution.

Metaverse immersive technologies (VR/MR/XR/AR) refer to a spectrum of immersive digital experiences that merge the physical and virtual worlds. Virtual reality (VR) fully immerses the user in a simulated environment, while augmented reality (AR) overlays digital content onto the real world. Mixed reality (MR) combines elements of VR and AR, allowing digital objects to interact with the physical environment. Extended Reality (XR) is an umbrella term that encompasses VR, AR and MR technologies. These technologies add a new dimension to learning, work and leisure activities by enabling interactive, immersive and experiential experiences that increase engagement and understanding. For simplicity, the survey uses the umbrella term XR technologies.

You will not receive any direct benefit from completing this survey but your feedback is invaluable in shaping the future of the educational experiences within the Metaverse Academy Project (Funded by the European Union). This survey aims to understand your perspectives and requirements concerning XR technologies in the field of your academic study. Your responses will help us tailor XR-based course content and ensure that the needs of our learners are effectively met. The findings from this survey might be used in academic or other forms of publications.

This survey will take approximately 15-20 minutes to complete. The collected data will be stored on a password protected cloud service for a period of 5 years. Your responses will remain anonymous and no personally identifiable information will be collected.

If you have any additional comments or suggestions, please feel free to share them at the end of the survey. By continuing to the survey questions you confirm that you are adequately informed about the project and consent to participate. Please note that you can withdraw at any time without adverse effects, but once submitted your submission will be de-identified.

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Sincerely,
Metaverse Academy Project Team

Demographic data

Gender

☐ male

☐ female

☐ diverse

Country of study

☐ Türkiye

☐ Bulgaria

☐ Germany

☐ Greece

☐ Israel

☐ Romania

☐ Slovakia

☐ South Africa

☐ Spain

☐ Sweden

☐ Other (please specify)

Educational Profile

☐ Humanities

☐ Social Sciences

☐ Natural Sciences

☐ Technical/Engineering

☐ Business/Management

☐ Health Sciences

☐ Arts

☐ Education

☐ Law

☐ Other (please specify)

Level of Education

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☐ Bachelor's degree

☐ Master's degree

☐ Doctorate/Ph.D.

☐ Other (please specify)

Years in the programme

☐ Less than one year

☐ 1-2 years

☐ 3-4 years

☐ 5 years or more

Experience and Perceptions Regarding XR and MOOCs

What is your experience with XR technologies?

☐ I have never heard of it

☐ I have heard of it but never used it

☐ I have seen demonstrations but never used it

☐ I have used it a few times

☐ I use it often but only because I have to

☐ I have a lot of experience using it for leisure and/or professional activities

Have you experienced any sort of XR technology in your Country?

☐ Yes

☐ No

If yes, please specify.

Do you think that XR technologies can benefit your Country?

☐ Yes

☐ No

☐ No opinion

I am interested to use XR technologies in my field of study

(Scale 1 to 5, 1= strongly disagree, 2=disagree, 3 =neither agree or disagree, 4 = agree, 5 =strongly agree)

☐ strongly disagree

☐ disagree

☐ neither agree or disagree

☐ agree

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☐ strongly agree

To what extent are XR technologies used in your study programme?
(Scale 1 to 5, 1 =not at all, 2 =rarely used, 3 =occasionally used, 4 =frequently used, 5 = very actively used)

☐ not at all

☐ rarely used

☐ occasionally used

☐ frequently used

☐ very actively used

Have you previously participated in any Massive Open Online Courses (MOOCs) (e.g. Coursera, EdX, Udemy, etc.)?

☐ Yes

☐ No

To what extent do you believe MOOCs provide flexible opportunities for acquiring new skills that are relevant to your academic goals?
(Scale 1 - 5, 1= not relevant at all, 2= slightly relevant, 3= moderately relevant, 4= very relevant, 5= highly relevant)

☐ not relevant at all

☐ slightly relevant

☐ moderately relevant

☐ very relevant

☐ highly relevant

Experience and Perceptions Regarding XR Technologies in my Field of Study

Please rate on a scale of 1-5 how much you agree with the following statements
(Scale 1 to 5, 1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree)

- XR technologies provide added value to theoretical learning experience
- XR technologies provide added value to practical learning experience
- Improved learning outcomes can be achieved through the use of XR technologies
- I have the capacities required to use XR technologies in my field of study

Please rate on a scale of 1-5 how relevant you think the listed competencies are

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for you to be able to use XR technologies effectively (Scale 1 - 5, 1= not relevant at all, 2= slightly relevant, 3= moderately relevant, 4= very relevant, 5= highly relevant)

- Creativity
- Technical literacy (how to operate devices)
- Adaptability to new interfaces
- Safety awareness
- Understanding the ethics surrounding XR
- Technical Design skills
- Creative Design skills

Please rate on a scale of 1-5 how you perceive your own level of competency in the listed areas (Scale 1 to 5, 1 = not competent at all, 2 = low competency, 3 = competent, 4 = moderately competent, 5 = highly proficient)

- Creativity
- Technical literacy (how to operate devices)
- Adaptability to new interfaces
- Safety awareness
- Understanding the ethics surrounding XR
- Technical Design skills
- Creative Design skills

Please rate on a scale of 1-5 how much you agree with the following statements (Scale 1 to 5, 1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree)

- It is difficult to integrate XR technologies into the regular study routine
- XR technologies have the ability to make the complexity of my learning field more accessible
- I feel confident in using XR technologies and utilising them for study work

What challenges do you consider while using XR technologies for learning? (Multiple selection possible)

☐ Technical Issues

☐ Lack of Training/Workshops

☐ Time Constraints

☐ High Costs

☐ Accessibility problems to Technical Infrastructure (stable internet connection and electricity, access to computer and/or mobile device)

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Additional Comments

Is there anything else you would like to share regarding your experience with XR educational tools and do you have any suggestions that could be important in the development of educational courses within the Metaverse Academy?

Is there anything else you would like to share regarding your needs as a student in terms of training and development to enter the XR industry in your field of study?

Country-specific Questions

South Africa

Please rate on a scale of 1-5 how each of the following factors will help you to learn about the use XR technologies
(Scale 1 to 5, 1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree)

- There is a stable internet connection where I study
- The internet connection where I study is strong and fast
- Stable electricity supply
- I have access to a mobile device that is capable of using XR technologies
- I have access to computers and other devices that make it possible to use XR technologies

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Annex 2: Need Analysis: Interview guideline for Industrial Stakeholders

By following this comprehensive guideline, partners can effectively conduct interviews with industrial stakeholders to gather valuable insights for the needs analysis of immersive technologies within various sectors. These insights will play a crucial role in shaping the educational courses of the Metaverse Academy project.

Introduction **Letter**

Please consider it as an inspiration/proposal, the letter can be adapted flexibly depending on who is being addressed, whether personal contacts already exist and whether there can be a more informal approach accordingly.

Subject: Request for Participation in an Interview for the Metaverse Academy Project

We hope this letter finds you well. We are writing to ask for your valuable participation in an interview aimed at gaining insights into the use and demand for immersive technologies, specifically AR/VR/MR and XR, across different sectors. This initiative is part of the Metaverse Academy project, funded by the European Union, which aims to develop training courses tailored to industry needs.

The Metaverse Academy project (funded by the European Union) focuses on immersive technologies that blend the physical and virtual worlds to enhance learning, work, and leisure activities. These technologies include Virtual Reality (VR), which immerses users in simulated environments; Augmented Reality (AR), which overlays digital content onto the real world; Mixed Reality (MR), which combines elements of VR and AR; and Extended Reality (XR), an umbrella term that encompasses VR, AR and MR technologies. These technologies offer interactive, immersive and experiential experiences that significantly increase engagement and understanding.

We are interested in finding out the industrial perspective on these technologies and their applications in your sector by conducting interviews with managers, administrators and operational staff. The interview will take approximately 45-60 minutes and all responses will be anonymised and kept confidential.

Your feedback is invaluable in shaping the future of educational experiences within the Metaverse Academy. We kindly request your permission to interview your employees and would appreciate your written confirmation of this.
Thank you for considering our request. We look forward to your positive response and to potentially collaborating to advance the application of immersive technologies in education and industry.

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Sincerely,
[Your Full Name]
[Your Position]
[Your Contact Information]
[Your Email Address]
[Your Phone Number]
[Your Organization's Name]

Consent Form
I hereby give my consent for interviews to be conducted with both employees and managers of our company as part of the Metaverse Academy project. The data collected will be anonymized and treated confidentially. Please send the signed consent form to [your email address] or bring it with you to the interview.

Signature & Date: _____

Interview Guideline

(1) Introduction & Background

Introduction could look like this:
"Thank you for taking the time to participate in this interview. We aim to gather insights from industry representatives like yourself to understand the demand and requirements for immersive technologies, particularly AR/VR and XR, across various sectors. Your perspectives will contribute to the development of educational courses tailored to meet these needs within the framework of the Metaverse Academy project. The interview will take approximately 45-60 minutes and your responses will be anonymized and treated confidentially."

Organization	
Name, Position	
Country	
Industry/Sector of operation	
Company size	

Could you please introduce yourself, mentioning your current sector/role?	
Could you give us an overview of your company/institution, including its areas of activity?	
Could you give us an overview of your	

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company/institution's use of Information and Communication technologies?	
How do you train your employees for new skills? Do you provide online or f2f training? How much time do they spend on a training program?	
In the Metaverse Academy project we will prepare a training program on immersive technologies such as AR/VR and XR targeting your field of working/sector. What would be your suggestions to develop an efficient and effective training program?	

(2) Awareness of Immersive Technologies

Have you heard of VR/AR/XR, Metaverse?	
Have you ever used VR/AR/XR, Metaverse personally or/and in your organization?	
Why do people or organizations use VR/AR/XR, Metaverse?	

(3) Use of Immersive Technologies

(If the answers in Section #2 is "no experience" move to Question-Section #4) Please briefly outline **your experience** with immersive technologies such as AR/VR and XR in your field of working/sector?	

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What **experiences have your company/institution** had with immersive technologies?	
To what extent do immersive technologies play a **role** in your work **sector** and in your company in particular?	
What specific applications or projects have been implemented in the past or are planned for the future in your company ?	

(4) Benefits, Challenges and Requirements

What **benefits** do you see in using immersive technologies for your company/institution?	
What specific **needs or challenges** could be addressed through the adoption of AR/VR/XR?	
Where do you see **constraints and limitations** to the use of immersive technologies in your organization and field of work? How could these be overcome?	
What particular **features or functionalities** do you believe are **necessary** for successful implementation in your sector?	

2. Workforce Demand and Training

What **skills** and knowledge do you believe are necessary for individuals working safely and effectively with immersive technologies (VR/AR/XR, Metaverse) in your field?	
Do you expect your **employees** to have	

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previous experience in working with immersive technologies? How do you prepare them for working with it?	
What **training or educational programs** currently exist to impart these skills, and how effective are they?	
Are there any specific gaps or needs in the training offerings that you have identified?	
In addition to using immersive technologies, do you want to train your personnel on the development of immersive technologies (e.g. development of a virtual reality based showroom or virtual shopping place) ?	
If there is a training program on VR/AR/XR, Metaverse, how should it be designed? • Which courses should be included? • Technical courses? • Soft skill courses? • online or onsite? • Other requirements e.g. in terms of accessibility, interactivity, level of difficulty.?	

(6) Collaboration between Industry and Educational Institutions

What **opportunities** do you see for enhanced collaboration between industry and educational institutions to address this gap (if there is one)?	

3. Conclusion

Is there anything else you would like to add that may be important for the	

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development of educational courses within the Metaverse Academy?	

Thank you for your time and valuable insights.

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