AMR EDUCare

Handbook for training materials

Course development methodology
MS1

Education on antimicrobial resistance for the health workforce

Co-funded by the European Union

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TABLE OF CONTENTS

Project information 2
1. Introduction 4
1.1. Purpose of the handbook 4
1.2. Considerations on the contents of courses 5
1.3. Overview of the Course Development Process 6
2. Developing Module Content 7
2.1. Structure of the AMR EDUCare modules 7
2.2. Check-in: orientation and guidance 8
2.2.1. Intended learning outcomes 8
2.2.2. Relevance for individual and group studies 8
2.2.3. Keywords 9
2.2.4. Workload 9
2.2.5. Navigation 10
2.3. Core content (activities) 11
2.3.1. Text for reading 11
2.3.2. Module summary (infographics) 11
2.3.3. Text for oral presentation (video/audio) 12
2.3.4. Assessment tools 14
2.3.5. Leaflet 14
2.4. Check-out: orientation and guidance 15
2.4.1. Debriefing and take-home messages 15
2.4.2. List of references and glossary 15
3. Course contents 15
3.1. Course on antimicrobial prescribing optimisation 15
3.2. Course on antimicrobial waste reduction and management 17
3.3. Course on patient empowerment 19
4. Roles of Lecturio in the Project 20
5. References 23
6. Annexes 25
6.1. Project level KPIs 25

1. Introduction

1.1. Purpose of the handbook

The **Course Development Methodology Handbook** is designed to provide comprehensive guidance to individuals involved in the creation of educational materials for the AMR EDUCare project. The primary audience for this handbook includes **educators, content creators, instructional designers, and course developers** responsible for developing and delivering courses. Whether you are contributing to the creation of video content, text-based materials, or interactive learning modules, this handbook outlines the processes, best practices, and collaborative efforts needed to ensure high-quality, pedagogically sound courses.

Each role within the course development process plays a critical part in shaping the final learning experience. Educators will find guidance on aligning course content with learning objectives and audience needs. Content creators will be supported in designing clear, engaging materials, while instructional designers and developers will benefit from detailed technical requirements and platform integration guidelines. By clearly defining the expectations and contributions of each role, this handbook aims to foster effective collaboration and ensure consistency across all modules developed for the AMR EDUCare project.

Ultimately, the Handbook serves as a blueprint for producing impactful, learner-centered educational materials that meet the goals of the project, ensuring all team members can contribute effectively to the success of the courses.

Drawing on the renowned Guide of the Association for Medical Education In Europe (AMEE), the Handbook harmonizes educational methodology and technical prerequisites for training modules, aligning them with the chosen educational platform, Lecturio. This Handbook is essential in developing impactful educational materials and advancing the AMR EDUCare project's mission.

Users of this Handbook Brief will

- have a better understanding of their roles and responsibilities in the course development process
- develop courses that meet the needs and expectations of the target audience
- understand standard course development terminology within the project

This Handbook Brief is being continuously developed, on one hand, based on developers' feedback and further needs analysis in the development phase of the project, on the other hand, based on user feedback, improving quality and effectiveness overtime.

Note1: The general aspects of educational methodology are partly specified based on the *AMEE Guide for education material development*[1].

[1] Brauer, D. G., & Ferguson, K. J. (2015). AMEE Guide No. 96: The integrated curriculum in medical education. Medical Teacher, 37(4), 312–322. https://doi.org/10.3109/0142159X.2014.970998

Davis, M. H., & Harden, R. M. (1999). AMEE Guide No. 15: Problem-based learning: a practical guide. Medical Teacher, 21(2), 130–140. https://doi.org/10.1080/01421599979743

The series of guides and handbooks of the Association for Medical Education in Europe (AMEE) about educational development is a comprehensive resource for educators and instructional designers in the field of health professions education. The AMEE publications are available online, and provide practical advice and guidance on all aspects of creating effective educational materials, including curriculum design, instructional design, assessment, and evaluation.

Note2: This Handbook harmonizes and identifies technical requirements for training modules produced in the core WPs of the AMR EDUCare project in the light of the training platform selected for the project. Suggested training platform: Lecturio.

1.2. Considerations on the contents of courses

Throughout the creation of the course, content-appointed technical specialists shall have autonomy for content selection. It is important however, that those responsible for content creation maintain a consistent standard that ensures courses are applicable to all target groups. It is recommended that technical content is tailored to deliver the key principles of the topic and avoid regional specifics such as advising national prescribing protocols and guidelines, recommending approaches that are reliant on specific branded technologies or other such content which cannot be easily transferred for the various target settings the courses shall provide.

Certain course content, such as best practice examples, case studies, may apply to such specifics. When such occasions arise, it is important to clearly state the purpose of these examples and that the course does not recommend them for implementation.

The recommended reading sections should be used to provide additional specific content related to the topic while avoiding including it in the core materials.

e.g. A course on waste management segregation can discuss the need for various waste segregation system principles and give country examples of these in practice, however the course should not state content from (or reference a specific protocol) as the method that should be implemented.

Modules are the building blocks of the courses developed in AMR EduCare.

Partners will receive editable templates for completing the modules' elements below (see Annexes).

WP	AMR EDUCare course modules	WP5
WP2 – Antimicrobial prescription	**a) Training programme for medical doctors and pharmacists:**	Digital Health Skills: Available technologies, state-of-the art digitalisations, technologies for health management. Behaviour change interventions.
	1. Antimicrobial resistance and antibiotics	
	2. Respiratory tract infections	
	2.1. Upper respiratory tract infections	
	2.2. Lower respiratory tract infections	
	3. Urinary tract infections	
	4. Other infections in adults	
	4.1 Sexually transmitted infections	
	4.2. Skin and soft tissue infections in adult patients	
	4.3. Oral and odontogenic infections	
	5. Common paediatric infections	
	6. Interpretation of microbiological results	
	7. The role of physicians and pharmacists in antimicrobial stewardship in the community	
	b) Training programme for nurses	
	1. Antimicrobial resistance and antibiotics	
	8. Role of nurses in infection prevention and control and antimicrobial stewardship in the community	
	c) Training programme for managers	
	1. Antimicrobial resistance and antibiotics	
	9. Role of primary healthcare managers in the correct use of antimicrobials	
WP3 - Waste management	1. Introduction to antimicrobial waste minimisation and management in healthcare settings	
	2. Managing waste in clinical practice and settings (Critical points of control)	
	3. Organisational strategies for mitigating waste and AMR in health facilities	
WP4 - Patient empowerment	1. Empowerment of young adults: Communication skills for professionals (prescribers, nurses and community pharmacists)	
	2. Empowerment of the general public	
	3. Empowerment of the elderly	

Figure 1: Elements of the programme in the AMR EDUCare project

1.3. Overview of the Course Development Process

The **Course Development Methodology Handbook** provides a structured roadmap for the creation of educational materials within the AMR EDUCare project. This process is divided into key phases, each designed to ensure the delivery of high-quality, learner-centered courses. The main stages include:

1. **Initial Planning**: Define course objectives and outline the overall structure of the modules. This phase focuses on aligning the content with the intended learning outcomes and audience needs.
2. **Content Development**: Create the core content, including text, video scripts, and interactive elements. Lecturio and course developers collaborate closely to ensure pedagogical soundness and clarity of materials.
3. **Review and Feedback**: Conduct phased reviews to gather input from internal experts, partners, and external reviewers. Feedback is iteratively incorporated to refine the content.
4. **Multimedia Integration**: Finalize video production, infographics, and other multimedia elements, ensuring seamless integration with the learning platform.

5. **Technical Implementation**: Ensure all content complies with technical standards, such as SCORM and xAPI, for easy integration into Learning Management Systems (LMS) like Lecturio.
6. **Final Approval and Launch**: After final revisions, the course content is approved and made available on the platform, complete with analytics and tracking features.

This concise process ensures consistency and clarity in course development, allowing teams to collaborate effectively while focusing on creating impactful educational experiences.

2. Developing Module Content

2.1. Structure of the AMR EDUCare modules

Modules are the building blocks of the courses developed in AMR EduCare. All modules are agreed to be built according to the same structure (*see: Figure 2. Structure of the modules in AMR EDUCare project*)

Based on the concepts of general educational methodology, learners' engagement and active learning require transparent settings, standard structure, and content provided in various forms according to different learning strategies and learning styles. This requires consistency regarding structure, orientation, guidance, and content on the design and development side, as well as flexibility regarding formats, timeframes, and learners' pathways.

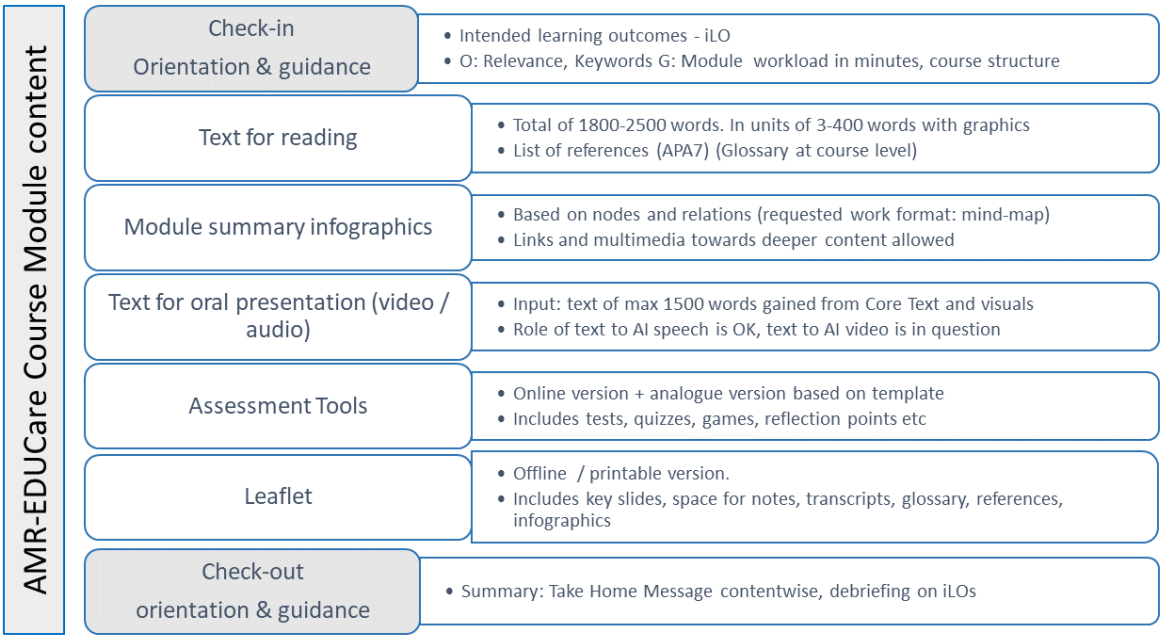


Figure 2. Structure of the modules in AMR EDUCare project

2.2. Check-in: orientation and guidance

The learner must be oriented about the relevance of the content, the aim of the module (*see Figure 3. Intended learning outcomes in AMR EduCare project*), the keywords of the material, and the workload for completion on a minimum level.

Developers need to define the learning outcomes (LO) of the programme on the course level as well as on the module level and align them with the activities (see: *Core content*) and the evaluation and feedback methods (see: *2.3.4. Assessment tools*)

2.2.1. Intended learning outcomes

Intended learning outcomes are the aims and objectives that the course developer sets for the learner and, at the same time, the learner intends to reach. These aims must be simple, specified and aligned with the activities and the evaluation. The learning outcomes must be transparently mapped and communicated at every level of the programme, so the learner can follow his/her learning journey, get engaged with the material, and be informed about his/her competence development.

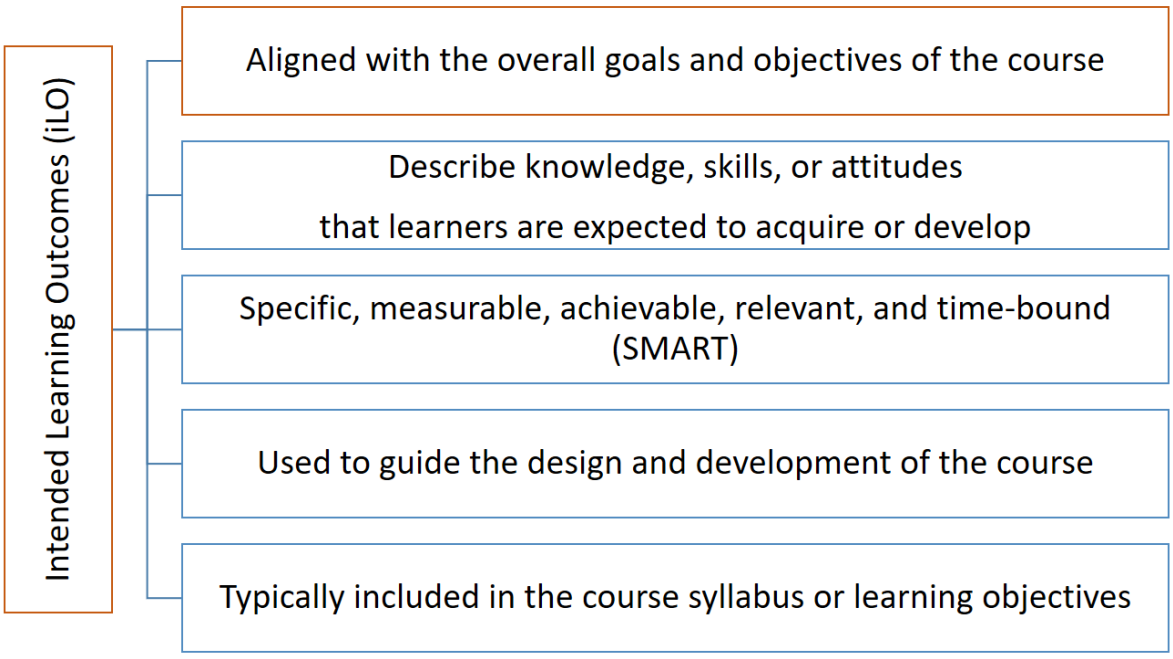


Figure 3. Intended learning outcomes in AMR EDUCare project

2.2.2. Relevance for individual and group studies

Relevance for individual experts:

- Intensive therapy doctor
- Nurse

- GP
- GP assistant
- Hospital manager
- Microbiologist
- Semi-professional lay audience

Define relevance for stakeholders for team-level training. Define the health professionals who should be involved in a team that studies your course. (E.g.prescribing GP, + GP assistant OR for WP2: intensive therapy doctors, management, nurses, hospital pharmacists, microbiology doctors, laboratory assistants, etc.)

2.2.3. Keywords

Keywords are essential elements, as they help both the developer and the learner to map the programme and navigate the content.

1. Target Audience Research: Understand your target audience and conduct keyword research to determine the terms and phrases they will likely use when searching for a course like yours. Consider their needs, interests, and pain points.
2. Relevance and Specificity: Choose keywords that accurately represent your course's content and learning outcomes. Be specific and avoid using generic terms. For example, instead of "AMR course," consider "course on AMR for prescribers."
3. Long-Tail Keywords: Include long-tail keywords, which are longer and more specific phrases likely to attract highly targeted traffic. Long-tail keywords often have less competition and can lead to higher conversion rates.
4. Use Tools and Analytics: Utilize keyword research tools like Google Keyword Planner, Moz, or SEMrush to identify popular and relevant keywords. Monitor and analyze your website and course analytics to see which keywords drive traffic and conversions.
5. Placement: Incorporate your chosen keywords strategically in various elements, such as the course title, description, headings, subheadings, and tags. However, ensure that the keywords are used naturally and do not compromise the readability and flow of your content.

2.2.4. Workload

Workload is a suggested net (reading, video watching, etc) and gross time (total required) for module completion, estimated by the developer. It is important for the learner to be informed about the time required for completion, as this highly determins his/her engagement and scheduling his/her time dedicated for learning.

Suggested workload, as a potential reference point, also gives immediate feedback for the learner about his/her invested effort and performance.

1. Course Content Analysis: Break down the course content into its components, such as video lessons, readings, assignments, quizzes and exams. Determine the estimated time

required for each component based on your own experience or input from subject matter experts.

2. Time Estimates for Videos: Calculate the duration of each video lesson and include it in the workload estimation. For example, if a video lesson is 10 minutes long, assign 10 minutes of workload to that component.
3. Additional Components: Consider other activities and assignments in the course. Estimate the time required for readings, assignments, quizzes, exams based on the complexity and expected level of effort.
4. Self-Paced Workload: Present the workload for a self-paced online course in a way that allows students to plan their own schedule. Instead of indicating hours per week, provide the estimated total workload for the entire course. For example:
    - Video Lessons: 8 hours
    - Readings: 6 hours
    - Quizzes: 2 hours
5. Total Workload: Sum up the estimated workload for all modules to give students an overall understanding of the time commitment required to complete the course. For example, the total workload for the course would be 42 hours.
6. Communication and Instructions: Communicate the workload breakdown and expectations to students through the course syllabus, online course description, or any platform where the course is presented. Provide instructions on accessing and navigating the course materials, including the video lessons.

Flexibility and Time Management: Highlight that the course's self-paced nature allows students to progress at their own speed within a given timeframe. Encourage students to plan their time effectively and manage their workload accordingly.

2.2.5. Navigation

Navigation in an educational programme is crucial for the success of the courses both for the developer and for the learner. The content must be well structured and mapped, and the platform must serve its goals in the most user-friendly way possible.

1. Preferred Way of Study: Provide students with an overview of the course's preferred way of studying. Explain the recommended order of completing modules or units, and highlight any dependencies or prerequisites. This helps students understand the logical progression of the course content.
2. Learning Pathways: Offer multiple learning pathways to accommodate diverse student needs and learning preferences. For example, some students may prefer a linear pathway, going through the course sequentially, while others may prefer a modular approach, focusing on specific topics of interest. Clearly present these pathways and guide students on how to choose their preferred learning route.
3. Mandatory and Optional Elements: Differentiate between mandatory and optional course elements. Clearly identify which components are essential for students to complete and indicate any additional resources, activities, or readings that are supplementary or

optional. This allows students to prioritize their efforts and focus on the core content while exploring optional materials at their discretion.

4. Introduction to Visual Signposts: Use visual signposts, such as icons, labels, or color codes, to assist students in navigation. For example, you can use an "Important" icon to highlight crucial concepts or a "Resource" icon to denote supplementary materials. Visual cues can help students quickly identify and locate specific types of content or activities within the course.
5. Navigation Tools: Implement user-friendly navigation tools within the online course platform. Ensure that students can easily access different modules, units, or sections of the course. Include a clear menu or table of contents that provides an overview of the course structure and allows students to jump to specific sections if needed.
6. Progress Tracking: Incorporate a progress tracking system that enables students to monitor their advancement within the course. This could include progress bars, checklists, or completion indicators. Clear feedback on completed tasks and milestones helps students stay motivated and provides a sense of accomplishment.
7. Clear Instructions: Provide detailed instructions on how to navigate the course platform, access different resources, submit assignments, and engage in discussions. Include a tutorial or orientation module at the beginning of the course to familiarize students with the online learning environment and its features

2.3. Core content (activities)

2.3.1. Text for reading

Text for reading is the written format of the core content, for those learners, who prefer to process the information by using a textbook. Regardless of that the text will be published in a digital or analogue form, a clear structure, a uniform appearance, a proportional distribution of content, readable font size, list of content, list of references and glossary of terms are basic requirements.

In a textbook, chapters should not be longer than 1800-2500 words, divided into subchapters of maximum 200-300 words. Each subchapter must cover part of the core content, standing on its own as a unit, for several reasons.

2.3.2. Module summary (infographics)

An infographic is the summary of the core content in a visual format, for those learners, who prefer to get a quick overview of the information by browsing through an algorithm, mindmap, timeline, etc. before going into details. It does not contain new information, but visualizes the key points (nodes) of the content, and the type of connections (relations) between them.

The infographic helps the learner to see the structure and the approach at one glance, and allows him/her to unfold the topic in an individual pathway, in his/her own pace.

Regardless of that the infographic will be published in a digital or analogue form, a clear structure, a uniform appearance, a proportional distribution of content, readable font size, limitation to one single page are basic requirements.

The infographic should effectively summarize and visually represent the main elements and connections of the module. It should be visually appealing, easy to understand, and enhance the learning experience for the online course participants.

1. Identify Nodes and Relations: Identify the main content elements (nodes) and their connections (relations). These can be topics, sub-topics, concepts, or any other relevant components. Group related elements and determine the hierarchy or sequence in which they should be presented. Connections are to clarify the nature of the relationship, such as cause and effect, sequence, or dependency.
2. Provide the request to the designer.
3. Include Supporting Information: If necessary, incorporate additional information, statistics, or examples within the infographic to support the main content elements and connections. Ensure that the additional information complements the overall visual presentation without overwhelming the infographic.
4. Review and Refine: Proofread the infographic for clarity, accuracy, and coherence. Ensure that the information presented is concise and easily understandable. Make any necessary revisions to improve the overall visual representation and alignment with the module content.

2.3.3. Text for oral presentation (video/audio)

Text for oral presentation is a combination of displayed written format (typically Powerpoint or Prezi) and notes for an oral presentation of the core content, for those learners, who prefer to process the information by attending or listening to lectures. It does not contain new information, but explains the key points (nodes) of the content, and the type of connections (relations) between them in a video for watching or audio for listening.

Regardless of that the displayed text will be published in a digital or analogue form, a clear structure, a uniform appearance, a proportional distribution of content, readable font size, list of content, list of references and glossary of terms are basic requirements.

In an oral presentation, slides should not contain too much written information, they are rather meant to support the explanation by visual aids, and multimedia. The list of content must be aligned with the core text (*see 2.2.1*), the slides must follow the same structure. Each slide must have an individual title, covering parts of the core content in main- and subchapters, standing on their own as units, as these will serve as bookmarks in the video or audio file.

An oral presentation must be optimized to the attention span of the learner, which means that the content must be chunked into building blocks of ideally 2-5 (maximum 10) -minute presentations, as individual units each. If the content requires more, it means that it can be

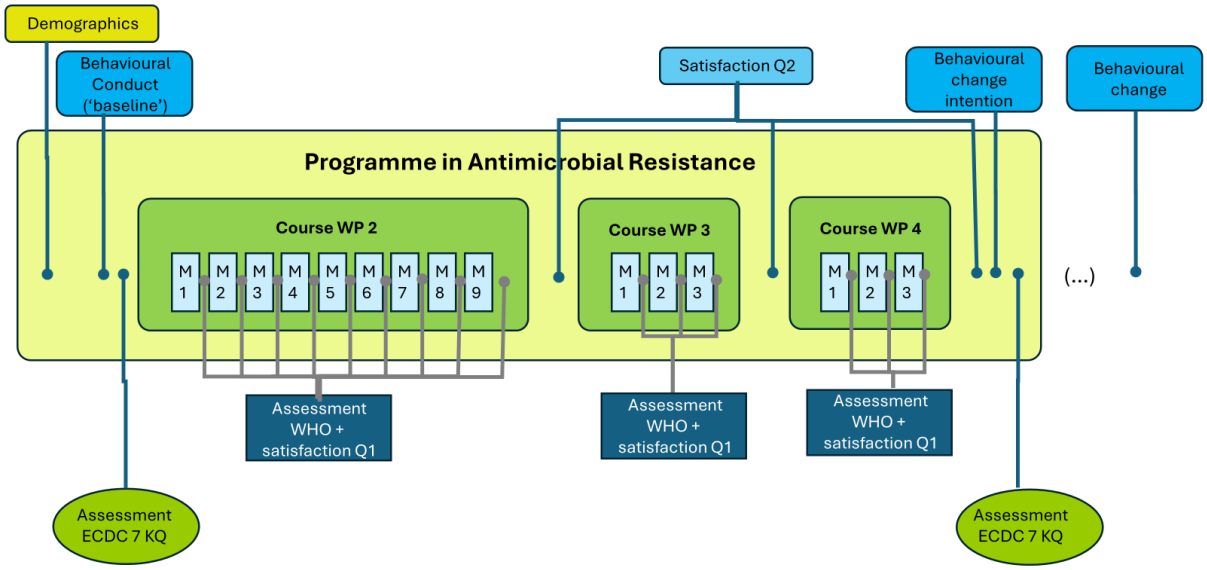
covered in multiple presentations. In this case, related parts must be clearly linked, but preferably following the list of content as unique building blocks in their titles, instead of being referred to as „part 1", „part 2" etc.

1. Define the Learning Objectives: Start by clarifying the specific learning objectives you want to achieve with the video. What key concepts or skills should the learners take away from the training? This will help you structure the content and ensure its relevance.
2. Outline the Content: Create an outline or storyboard that outlines the main topics and subtopics you want to cover in the video. Organize the information in a logical and sequential manner, ensuring a smooth flow from one topic to the next.
3. Introduce the Video: Begin the video with a brief introduction that grabs the learners' attention and provides an overview of what they will learn. Clearly state the purpose and relevance of the training to set the context.
4. Break Down the Content: Divide the content into smaller sections or modules that can be easily understood within the 10-minute timeframe. Each section should focus on a specific topic or concept, making it easier for learners to follow along and comprehend the information.
5. Use Clear and Concise Language: Write the script using simple and concise language. Avoid jargon or technical terms that may confuse the learners. Use active voice and clear sentence structures to enhance comprehension.
6. Provide Examples and Visuals: Incorporate real-world examples, case studies, or visual aids to illustrate the concepts being taught. Visuals can help enhance understanding and engagement with the content.
7. Use a Conversational Tone: Write the script in a conversational tone to make the learners feel like they're having a conversation with the instructor. This helps create a more engaging and relatable learning experience.
8. Incorporate Interaction and Engagement: Consider adding interactive elements to the video, such as quizzes, questions, or activities, to keep learners engaged and assess their understanding of the content.
9. Summarize and Recap: At the end of each section or module, provide a summary or recap of the key points covered. This helps reinforce the learning and ensure important concepts are not missed.
10. Conclude the Video: End the video with a conclusion that recaps the main takeaways, reiterates the importance of the content, and encourages learners to further explore the topic.
11. Practice and Record: Once the script is finalized, practice delivering the content to ensure a smooth and confident delivery. When recording the video, speak clearly and with enthusiasm to keep learners engaged.

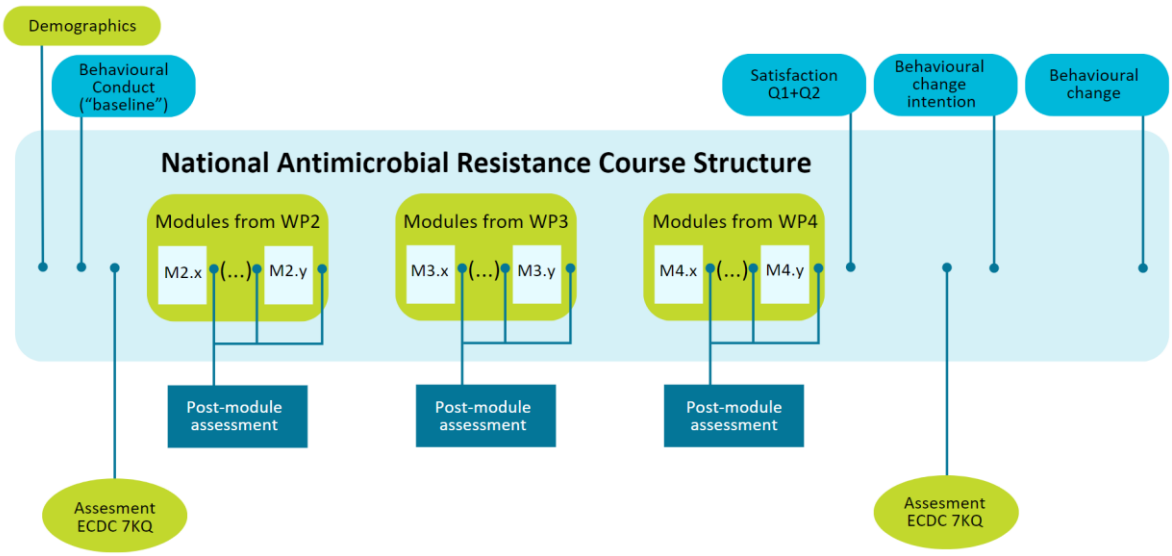
Please also provide visual aids for the video - suggested to use the same aids as in core text.

2.3.4. Assessment tools

The structure of the assessment tools is as follows in the below figure for the courses on the Lecturio White Label platform:



The survey structure of the individual modules on the pages of the national platforms is the following:



2.3.5. Leaflet

The module leaflets are visual summaries of the entire module contents.

2.4. Check-out: orientation and guidance

2.4.1. Debriefing and take-home messages

Debriefing is an important part of the course, as it gives a short summary and feedback for the learner about the route traveled in his/her learning journey. It reflects on the intended learning objectives, and specifically highlights them as accomplished outcomes from the perspective of the content and the developed competences.

2.4.2. List of references and glossary

References are important for the learner to see evidence of what is stated by the developer, and have the sources at hand for further reading. In the AMR-EduCare project, we use the APA7 publication style; citation within the text (Smith, 2023), hyperlinked to the reference list, opening an info label with the full reference. All references must be listed at the end of each module.

Glossary is a list of terms, used in the material, specifically referred to the relevant sources. Clear terminology is crucially important for the success of the course, as learners of diverse backgrounds may use similar (or the same) terms with different notions on their own disciplinary fields.

3. Course contents

During the AMR EDUCare project, the following three courses are to be developed:

Figure 4. Contents of the programme in AMR EDUCare project

3.1. Course on antimicrobial prescribing optimisation

Course Offering: Enhancing Antimicrobial Stewardship in Primary Healthcare

a) Training programme for medical doctors and pharmacists:

1. Antimicrobial resistance and antibiotics
2. Respiratory tract infections

2.1. Upper respiratory tract infections

2.2. Lower respiratory tract infections

3. Urinary tract infections

4. Other infections in adults

4.1 Skin and soft tissue infections in adult patients

4.2. Sexually transmitted infections

4.3. Intraabdominal infections

4.4. Oral and odontogenic infections

4.5. Special populations

5. Common paediatric infections

6. Interpretation of microbiological results

7. The role of physicians and pharmacists in antimicrobial stewardship in the community

b) Training programme for nurses

1. Antimicrobial resistance and antibiotics

2. Role of nurses in infection prevention and control and antimicrobial stewardship in the community

c) Training programme for managers

1. Antimicrobial resistance and antibiotics

2. Role of primary healthcare managers in the correct use of antimicrobials

1) Intended Learning Outcomes:

- Understand the fundamental concepts of antimicrobial resistance (AMR) and the responsible use of antibiotics.

- Evaluate the specific learning needs and knowledge gaps in relation to AMR and antimicrobial use among primary care health professionals.

- Apply evidence-based practices in the management of upper respiratory tract infections, lower respiratory tract infections, urinary tract infections, skin and soft tissue infections, oral and odontogenic infections, sexually transmitted infections, intraabdominal infections, and common pediatric infections.

- Interpret microbiological results to guide appropriate treatment decisions.

- Demonstrate the role of physicians and pharmacists in antimicrobial stewardship in the community.

- Employ effective communication strategies to engage patients and address AMR concerns.

- Analyze the unique responsibilities of nurses and managers in antimicrobial stewardship.

2) Keywords:

Antimicrobial resistance, antibiotics, primary care, responsible use, upper respiratory tract infections, lower respiratory tract infections, urinary tract infections, skin and soft tissue infections, oral and odontogenic infections, sexually transmitted infections, intraabdominal infections, pediatric infections, microbiological results, physicians, pharmacists, nurses, managers, evidence-based antibiotic prescribing, primary care AMR prevention, responsible antimicrobial use, optimal antibiotic therapy, healthcare stewardship strategies, evidence-based strategies for responsible antibiotic use, optimal antibiotic prescribing in primary care, primary healthcare AMR prevention techniques, effective primary care stewardship practices, responsible antimicrobial use guidelines

3) Summary Text for Course Contents:

Our comprehensive course "Enhancing Antimicrobial Stewardship in Primary Healthcare" equips primary care health professionals with in-depth knowledge and skills to combat antimicrobial resistance (AMR) effectively. Explore diverse modules covering essential topics such as understanding AMR and antibiotics, managing various infections in adult patients, interpreting microbiological results, and embracing the role of physicians, pharmacists, nurses, and managers in antimicrobial stewardship. Dive into evidence-based practices, communication strategies, and specialized responsibilities to become a catalyst for positive change in combating AMR within the primary care setting.

4) Summary Infographics Suggestion: An infographic could present a roadmap of the course modules, highlighting the sequence of topics covered, key learning outcomes, and a visually engaging representation of the diverse areas addressed. Additionally, infographics could depict a collaborative healthcare environment, showcasing the roles of physicians, pharmacists, nurses, and managers in fostering antimicrobial stewardship and combatting AMR.

3.2. Course on antimicrobial waste reduction and management

Course Offering: Sustainable practices for antimicrobial waste reduction and management

Course Modules:

1. Critical points of control for waste management
2. Reliable surveillance and risk assessment
3. Digital solutions that reduce and improve the management of antimicrobial waste

1) Intended Learning Outcomes:

- Understand healthcare waste minimization and management systems and the role of waste management in AMR development.

-Recognize the modes of waste minimisation including the role of procurement and waste management in combating antimicrobial resistance (AMR) within the healthcare sector.

- Promote and implement sustainable practices that effectively reduce antimicrobial waste and its associated environmental impact.

- Understand the significance of circularity and green procurement in minimising AMR risks and fostering responsible resource utilization.

- Guide healthcare institutions in adopting environmentally conscious clinical care practices that reduce waste and procurement strategies to address AMR challenges.

- Understand the concepts of critical control points for effective waste management and disposal

- Enable healthcare workers to understand the role of reliable surveillance and risk assessments as a tool to address potential AMR development due to improper waste disposal.

- Harness digital solutions to streamline and enhance the management of antimicrobial waste, contributing to efficient and responsible practices.

2) Keywords:

Procurement, waste minimisation, waste management, antimicrobial resistance, sustainable practices, green procurement, healthcare sector, environmental impact, critical control points, surveillance, risk assessment, digital solutions, eco-friendly procurement, antimicrobial waste reduction, green healthcare practices, sustainable waste management, AMR prevention solutions, eco-friendly procurement for AMR prevention, antimicrobial waste reduction strategies, green practices for healthcare sustainability, sustainable waste management solutions, environmental impact of antimicrobial waste

3) Summary text for course contents:

Our course "Antimicrobial waste reduction and management" aims to build healthcare workers' understanding of waste minimisation and management and its role in antimicrobial resistance development. This aims to support healthcare workers to utilize procurement, waste minimization and management as tools in the fight against AMR. Modules of this course include critical areas such as reducing antimicrobial waste, emphasizing green procurement, guiding healthcare institutions in adopting eco-friendly practices, and utilizing

digital solutions for efficient antimicrobial waste management. Join us to empower healthcare professionals and managers with the resources needed to identify waste-related challenges and implement sustainable solutions that combat AMR.

4) Summary infographics suggestion:

An infographic could illustrate the lifecycle of antimicrobial waste, starting from procurement to disposal. It could highlight the impact of improper waste management on AMR development and showcase the critical control points and digital solutions that contribute to responsible waste management practices.

3.3. Course on patient empowerment

(Section contents approved by WP4)

Course Offering: Empowering patients through informed healthcare

Course Modules each offering communication skills for professionals (prescribers, nurses and community pharmacists)

1. Empowerment of young adults
2. Empowerment of the general public (including parents and health workforce in pediatric care)
3. Empowerment of the elderly

1) Intended Learning Outcomes:

- Comprehend the vision of patient empowerment and its role in combating antimicrobial resistance (AMR).

- Develop essential communication skills necessary for effective patient education, tailored to various age groups and backgrounds.

- Create, adapt, and employ a diverse range of materials and tools to facilitate the transfer of knowledge from healthcare professionals to patients.

- Equip patients from diverse backgrounds with the knowledge to navigate healthcare topics through engaging educational resources.

- Identify and bridge knowledge gaps across patients and healthcare professionals, enhancing understanding of antibiotic use and its far-reaching impacts.

- Provide resources and manuals for tracking improvement on communication skills among healthcare professionals

2) Keywords:

Patient empowerment, healthcare education, communication skills, healthcare professionals, patient engagement, educational resources, knowledge gaps, antibiotic use, antimicrobial resistance, AMR Awareness, effective communication skills for patient education on antibiotics, informed decisions about antibiotic use

3) Summary Text for Course Contents:

The course "Empowering Patients through Informed Healthcare'' represents our vision of equipping patients with the awareness and understanding necessary for informed antibiotic use. The three modules are designed to cultivate effective communication skills among healthcare professionals, enabling them to inform and therefore educate patients of various age groups and backgrounds. The course will engage the trainees via a diverse set of materials and tools, promoting knowledge transfer from professionals to patients. Participate in a platform generated by a healthcare related entities network, promoting the sharing of best practices for patient education. All resources generated have been developed thanks to a co-creation work with patients and healthcare professionals from all across Europe, resulting in outreach educational content that bridges knowledge gaps and empowers individuals to make informed healthcare decisions. All resources are online and outreach resources can be downloaded freely.

4) Summary Infographics Suggestion:

An infographic could visually represent the collaborative cycle of knowledge transfer between healthcare professionals and patients. It could highlight the diverse educational resources, effective communication strategies, and the overall empowerment journey that both parties undertake.

4. Roles of Lecturio in the Project

Lecturio has a central role in the course development process for the AMR EDUCare project. Here are the most important roles of their contribution in the course creation process:

1. Initial Content Development

- Support for Didactic Structure: Lecturio provides expertise in structuring courses, ensuring that modules are pedagogically sound and aligned with learning objectives.
- Content Outline Creation: Lecturio assists in developing conceptual outlines for modules, supporting course developers in organizing content effectively to meet the educational goals of the AMR EDUCare project.

2. Content Review and Enhancement

- Text Element Review: Lecturio performs didactic revisions on text elements provided by course developers, ensuring consistency, clarity, and adherence to educational standards. They also enhance these with suitable infographics to improve understanding and engagement.
- Interactive Module Design: Lecturio integrates interactive elements such as quizzes, drag-and-drop activities, and scenario-based learning into the modules, leveraging tools like Articulate Rise. This ensures modules are engaging and promote active learning.

3. Multimedia Production and Integration

- Video Production: Lecturio handles the production of video content, including recording, editing, and post-production. This involves transforming provided input into polished videos, adding visual elements like lower thirds, and managing post-production tasks such as animation where needed.
- Translation and Integration: All content, including videos and interactive modules, is translated into six languages, with translations integrated directly into the learning modules.

4. Content Hosting and Analytics

- Video Hosting and Tracking: Lecturio hosts videos on a secure platform, providing analytics to track engagement, such as completion rates and learner interactions.
- Platform Compatibility: The modules are developed to ensure compatibility with various Learning Management Systems (LMS) and adhere to SCORM and xAPI standards, ensuring smooth integration into platforms.

5. Collaborative Workflow and Review Process

- Phased Peer Review: Lecturio facilitates a collaborative review environment. Content is reviewed in phases, with feedback loops involving both internal experts and external reviewers to incrementally improve content.
- Version Control and Document Management: Lecturio implements version control systems to manage the course materials efficiently, ensuring that all updates are documented and traceable during the development process.

6. Final Approval and Integration

- Approval Process: After gathering and consolidating feedback, Lecturio assists in preparing the final version of the content, which is then reviewed and approved by the relevant stakeholders before being uploaded to the platform.

7. Course Summary and Supplementary Materials

- Infographic Creation: Lecturio enhances course materials by creating infographics that visually summarize key concepts, making it easier for learners to grasp and retain information.
- Supplementary Materials: They contribute additional resources, such as summaries and downloadable leaflets that support learners' understanding of the core material

5. References

Brauer, D. G., & Ferguson, K. J. (2015). AMEE Guide No. 96: The integrated curriculum in medical education. Medical Teacher, 37(4), 312–322. https://doi.org/10.3109/0142159X.2014.970998

Davis, M. H., & Harden, R. M. (1999). AMEE Guide No. 15: Problem-based learning: a practical guide. Medical Teacher, 21(2), 130–140. https://doi.org/10.1080/01421599979743

Dent, J. A., Harden, R. M., Hunt, D., & Hodges, B. D. (Eds.). (2017). A practical guide for medical teachers (Fifth edition). Elsevier.

Frye, A. W., & Hemmer, P. A. (2012). AMEE Guide No. 67: Program evaluation models and related theories. Medical Teacher, 34(5), e288–e299. https://doi.org/10.3109/0142159X.2012.668637

Harden, R., Davis, M. H., & Association for Medical Education in Europe. (2001). The core curriculum with options or special study modules. AMEE.

Harden, R. M. (1986). Ten questions to ask when planning a course or curriculum. Medical Education, 20(4), 356–365. https://doi.org/10.1111/j.1365-2923.1986.tb01379.x

Harden, R. M. (1998a). AMEE guide No. 12: Multiprofessional education: Part 1 - effective multiprofessional education: a three-dimensional perspective. Medical Teacher, 20(5), 402–408. https://doi.org/10.1080/01421599880472

Harden, R. M. (1998b). AMEE guide No. 12: Multiprofessional education: Part 1 - effective multiprofessional education: a three-dimensional perspective. Medical Teacher, 20(5), 402–408. https://doi.org/10.1080/01421599880472

Harden, R. M. (2001). AMEE Guide No. 21: Curriculum mapping: a tool for transparent and authentic teaching and learning. Medical Teacher, 23(2), 123–137. https://doi.org/10.1080/01421590120036547

Harden, R. M., & Crosby, J. (2000). AMEE Guide No 20: The good teacher is more than a lecturer - the twelve roles of the teacher. Medical Teacher, 22(4), 334–347. https://doi.org/10.1080/014215900409429

Harden, R. M., & Laidlaw, J. M. (2013). Be FAIR to students: Four principles that lead to more effective learning. Medical Teacher, 35(1), 27–31. https://doi.org/10.3109/0142159X.2012.732717

Harden, R. M., & Laidlaw, J. M. (2021). Essential skills for a medical teacher: an introduction to teaching and learning in medicine.

Harden, R. M., & Lilley, P. (2018). The eight roles of the medical teacher: the purpose and functions of a teacher in the healthcare professions. Elsevier.

Ramani, S., & Leinster, S. (2008). AMEE Guide no. 34: teaching in the clinical environment. Medical Teacher, 30(4), 347–364. https://doi.org/10.1080/01421590802061613

R.M. HARDEN, E. A. H., J. M. LAIDLAW. (1999). AMEE Guide No 16: Study guides-their use and preparation. Medical Teacher, 21(3), 248–265. https://doi.org/10.1080/01421599979491

Sandars, J. (2009). AMEE Guide No. 44: The use of reflection in medical education. Medical Teacher, 31(8), 685–695. https://doi.org/10.1080/01421590903050374

Schuwirth, L. W. T., & Van Der Vleuten, C. P. M. (2011). AMEE Guide No. 57: General overview of the theories used in assessment. Medical Teacher, 33(10), 783–797. https://doi.org/10.3109/0142159X.2011.611022

Shumway, J. M., & Harden, R. M. (2003). AMEE Guide No. 25: The assessment of learning outcomes for the competent and reflective physician. Medical Teacher, 25(6), 569–584. https://doi.org/10.1080/0142159032000151907

Young, J. Q., Van Merrienboer, J., Durning, S., & Ten Cate, O. (2014). AMEE Guide No. 86: Cognitive Load Theory: Implications for medical education. Medical Teacher, 36(5), 371–384. https://doi.org/10.3109/0142159X.2014.889290

6. Annexes

6.1. Project level KPIs

from Proposal

% of training participants reporting increased understanding of responsible antibiotic prescription

- Unit of measurement: % of training participants

- Baseline: 68% of medical doctors answering correctly the 7 ECDC knowledge questions on AMR

- Target value: 20% increase

% of medical doctors in target countries reporting a change in their prescription habits

- Unit of measurement: % of training participants

- Baseline: to be established at the outset through pre-training surveys

- Target value: 10% increase in prudent antibiotic prescription practices

% of training participants reporting increased understanding of responsible antimicrobial procurement and waste management

- Unit of measurement: % of training participants

- Baseline: 40% health management professionals answering correctly the 7 ECDC knowledge questions on AMR

- Target value: 20% increase

% of health management professionals in target countries reporting a change in their waste management practices

- Unit of measurement: % of training participants

- Baseline: to be established at the outset through pre-training surveys

- Target value: 10% increase in improved antimicrobial waste management practices

% of training participants reporting increased communication skills and experience in managing

patient interactions

- Unit of measurement: % of training participants
- Baseline: to be established at the outset through pre-training surveys
- Target value: 20% increase

% of medical doctors, nurses and pharmacists in target countries reporting a change in their communication style and approach with patients

- Unit of measurement: % of training participants
- Baseline: 55% of prescribers or dispensers report providing advice on prudent antibiotic use to patients
- Target value: 10% increase

% of patients who show more prudent attitudes and behaviors on antibiotics use

- Unit of measurement: % of training participants who report changes in patient behavior
- Baseline: to be established at the outset through pre-training surveys
- Target value: 10% increase