DIGIWIND

D2.2

DIGIWIND STANDARD OPERATING PROCEDURES (SOP)

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Authors	Kristine Bilgrav-Nielsen (CADP), Jens Carsten Bach (CADP), Camilla Tække (CADP), Claus Riekehr Møller (CADP), Karsten Kryger (DTU), Nikolay Dimitrov (DTU), Tuhfe Göçmen (DTU)
Reviewers	Ulla Gade Bisgaard (DTU)

DigiWind

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07/06/2024	0.0	Kristine Bilgrav-Nielsen (CADP), Jens Carsten Bach (CADP), Camilla Tække (CADP), Claus Riekehr Møller (CADP)	Very first draft shared with the consortium members
11/06/2024	0.1	Karsten Kryger (DTU), Nikolay Dimitrov (DTU), Tuhfe Göçmen (DTU)	Deliverable formatting, Additional Content on step-by-step guidelines, further recommendations and additional requirements (including course evaluation templates, Appendices)
16/06/2024	0.2	Wei Yu (TUD)	General comments and add information from TUD side
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Executive Summary

The DigiWind project has developed a comprehensive Standard Operating Procedure (SOP) to guide the creation of high-quality digital learning materials and courses for M.Sc./Master and Lifelong learning training tracks. This SOP aims to ensure that digital learning modules will meet educational objectives, engage learners, and adhere to technical and accessibility standards.

The SOP enables the creation of systematic processes for digital learning, focusing on motivation, flexibility, and effectiveness.

Digital content vs. digital learning

Digital content is simply information shared digitally, while digital learning is designed for digital platforms, emphasising interaction and tailored experiences.

Important elements

- Development process: Adapting to current learning situations, realistic time allocation, and clear project initiation.
- Learning content: Engaging learners through structured, interactive, and inclusive content.
- Technologies: Purposeful technology selection that supports learning objectives and integrates interactive elements.
- Implementation: Ensuring ownership, maintenance, and stakeholder involvement.

Creating high-quality digital teaching

A step-by-step guide that includes assessing needs, developing infrastructure, designing engaging content, fostering interactive environments, implementing assessments, ensuring quality, and training trainers.

Recommendations for good digital learning

Recommendations to enhance engagement and retention include storytelling, micro-learning, motivation strategies, appropriate interaction levels, gamification, blended learning, and careful technology selection.

Additional requirements and best practices

- Institute level requirements: Compliance with institutional guidelines and creation of support teams.
- Co-development of lifelong learning modules: Outlining intellectual property rights and revenue-sharing arrangements.

The DigiWind SOP provides a framework for developing digital learning courses that are engaging, effective, and aligned with institutional and industry standards, supporting continuous improvement and professional development.

Continuous Improvement

The DigiWind SOP is a living document that is continuously being updated based on new experiences from the project activities.

Table of Contents

Definitions, Acronyms and Abbreviations

Acronym/ Abbreviation	Title
AR	Augmented Reality
HEI	Higher Education Institute
LMS	Learning Management System(s)
SOP	Standard Operating Procedure(s)
VR	Virtual Reality

1 Introduction

1.1 Purpose

The purpose of this Standard Operating Procedure (SOP) within the DigiWind project is to recommend a systematic process for designing, developing, and implementing digital learning materials and courses. **It serves as a guide for educational designers and developers (for both M.Sc. / Master and Lifelong-Learning training tracks)**, ensuring that digital learning resources meet educational objectives, engage learners, and adhere to technical and accessibility standards.

1.2 Digital content vs. digital learning

Digital content, such as a PowerPoint presentation or a recorded lecture, represents information shared through digital means and can be integrated into blended learning environments. However, merely presenting content in a digital format does not constitute digital learning in itself. Digital learning, in contrast, refers to education that is specifically designed for and delivered on digital platforms, with content that is originally created within a digital framework.

Digital learning, as opposed to analogue, utilises digital technologies to make learning more motivating, flexible, and effective, thereby better meeting individual student needs.

Learning objectives in a digital teaching curriculum must adapt to digital didactics, focusing on how students learn best in a digital context and ensuring the learning is tailored accordingly.

Transforming training into digital learning requires:

- Thinking more about the content and structure of the digital learning.
- You cannot make verbal bridges as in a physical teaching situation
- It's uncertain if students will lose interest.
- Revisiting content to condense and eliminate 'noise'/unnecessary information.
- Considering how to use digital learning to engage users, including involvement, interaction, discussion, and gamification.
- Creating learning based on users' preferences, considering how they will consume content and in what context they learn best (e.g., on-the-go, from home, through group work, in the classroom).

Creating engaging and impactful digital learning modules requires a unified approach among all stakeholders involved in the development process. This harmonised approach ensures that the learning objectives, content, technologies used, and implementation strategies align perfectly with the learners' needs and organisational goals.

2 Important elements of digital learning

The important elements of educational design and development at all levels are listed below.

2.1 Defining the learning project

Adaptation to current learning situations: Evaluate the existing learning environment to identify areas for digital enhancement or transformation.

Time allocation: Recognise that a successful digital learning project requires a realistic allocation of time for project initiation, availability of experts, content review, and testing deadlines.

Project initiation: The start of the project is critical. Ensure all stakeholders understand the timeline, objectives, and their roles.

2.2 How to make learning content

Didactic vs. Digital Didactic: Understand the difference between traditional classroom teaching (didactic) and digital learning methods (digital didactic). This involves focusing more on content structure and the opportunity to streamline learning material by removing extraneous information (see section about didactics).

Engagement: Utilise the digital format to engage learners actively. Consider how learning will be used to engage students and create learning experiences that are relevant to them on their terms.

Content structure: Be deliberate about the organisation of learning content. Use storytelling, visual aids, and interactive elements to make the learning experience memorable.

Learning styles and preferences: Acknowledge diverse learning styles by incorporating:

- Visual (infographics and diagrams, videos and animations, interactive whiteboards, etc.)
- Aural (podcasts and audio lectures, voiceover explanations and tutorials, etc.)
- Kinesthetic elements (interactive activities e.g., drag-and-drop exercises, immersive experiences e.g., augmented reality (AR), etc.)

Feedback and adaptation: Establish mechanisms for collecting learner feedback to improve the learning content and experience continuously.

Inclusion and diversity: When creating the content, you must ensure that the content is accessible to all learners. Think of your target audience and the diversity of it. Should you include subtitles in English, if it is not taught in their mother tongue? Can you think of relevant diverse profiles you could invite as guest lecturers, mentors, teaching / learning assistants or similar? And in the storyline, text, video etc. incorporate diverse perspective and examples that reflect the varied identities and backgrounds of your students – to foster inclusion in the learning environment.

Motivation and engagement: Utilise motivational theories and strategies to foster internal motivation, such as creating a sense of autonomy, competence, and relatedness.

2.3 Technologies for digital learning

Purposeful technology selection: Technology should be chosen to support your learning objectives, not the other way around. It is all about choosing the right technology to support the learning.

Interactive elements: Incorporate exercises and tasks that promote active learning and retention. Utilise tools like Articulate 360 or Rise to create multiple-choice questions, drag and drop exercises, and interactive simulations.

Technology integration: Ensure the digital learning content is compatible with existing Learning Management Systems (LMS) and meets technical specifications, such as SCORM compatibility and HTML5 format for broader accessibility.

2.3.1 Choosing the right technology

The following tips ensure effective technology integration, making digital learning more engaging and impactful.

Align technology with what you want to achieve

- Choose technology that directly supports learning objectives, such as interactive simulations and touch screens for hands-on skills, XR technologies when the learner needs to experience something that makes an impact on them etc.
- Choose a technology that fits the learning scenario (synchronous or asynchronous).
- Avoid selecting technology for its novelty; ensure it serves an educational purpose.

Use interactive elements

- Incorporate quizzes, drag-and-drop exercises, and simulations to promote active learning.
- Tools like Articulate 360 or Rise can help create engaging content.

Ensure compatibility

- Make sure digital learning content works with existing Learning Management Systems (LMS) and meets technical standards like SCORM and HTML5 (that is embedded in e.g., Adobe Captivate and elucidat).

Leverage multimedia

- Use videos, infographics, and animations to cater to different learning styles.
- Ensure multimedia content is accessible, with subtitles and transcripts.

Promote collaboration

- Use discussion boards, group projects, and peer reviews to encourage interaction.
- Integrate tools that support synchronous and asynchronous learning.

Provide training

- Offer training for both instructors and students on using the technology effectively.
- Create user guides and tutorials.

Gather Feedback

- Regularly collect feedback to identify technical issues and areas for improvement.
- Use feedback to update and improve the technology.

Stay updated

- Keep up with new digital tools and technologies.
- Integrate new tools as appropriate, ensuring they align with learning objectives.

2.4 Implementation

Ownership and maintenance: Assign a project owner and determine who will maintain the learning content and platform moving forward, ensuring support and maintenance.

Training for technology use: Develop a plan to educate the target group on utilising the new technology efficiently.

Stakeholder involvement: Ensure the involvement of key stakeholders not only during the development but also in the implementation phase to maintain continuity and support. You can consider inviting them as guest lecturer or speakers. It might also be beneficial to include them in the course evaluation, where they could attend (selected) modules you would like to get feedback on.

2.5 How to create high-quality Digital Learning?

As defined at DTU, “good teaching is facilitating participants’ learning by motivating them, setting clear learning objectives, creating a safe atmosphere to speak up and participate, providing various opportunities to apply the knowledge and skills, and providing constructive feedback”. To bring it all together, DigiWind courses will follow constructive alignment in their design and execution, ensuring that every element from learning objectives to assessments is purposefully integrated to enhance student engagement and achievement.

In the digital realm, this means clearly defining what students should achieve (learning objectives) and then designing digital activities, resources, and assessments that directly support these goals. For instance, if a course aims to develop critical thinking skills, digital tools like discussion forums, interactive case studies, and real-time feedback mechanisms should be employed to engage students in critical analysis and

reflection. This alignment ensures that every aspect of the digital learning experience is purposefully directed towards achieving the desired educational outcomes, thereby making the learning process more effective and meaningful.

In order to establish a set of recommendations towards world-class education for wind and energy systems colleagues of today and tomorrow, delivered via highly accessible and engaging digital medium, a step-by-step guideline is presented below. The guideline is applicable to both M.Sc. / Master level courses and Lifelong learning modules.

Step 1: Assess needs as the big picture and define goals – Learning Objectives

Gather data and/or knowledge on student needs as well as faculty capabilities in terms of infrastructure and existing resources. Identify the gaps in current educational offerings and learning outcomes that digital learning could fill, also in line with the industry needs as outlined in the D1.2 Knowledge Bank.

Especially for preparing the M.Sc. / Master curricula and Lifelong learning pathways as continued education programmes, also define what your institution hopes to achieve with its digital learning initiatives, such as increasing accessibility, enhancing student engagement, or expanding course offerings. It is recommended, if not mandatory, to follow the institution level mission, vision and strategy for digitalisation - see DTU example here.

Start by seeing the big picture first; understand the overarching goals and strategic objectives of your digital learning initiatives. Then, define the learning objectives for your course to ensure they align with these broader goals. This approach ensures that your course contributes to the overall mission while providing clear, measurable outcomes for students.

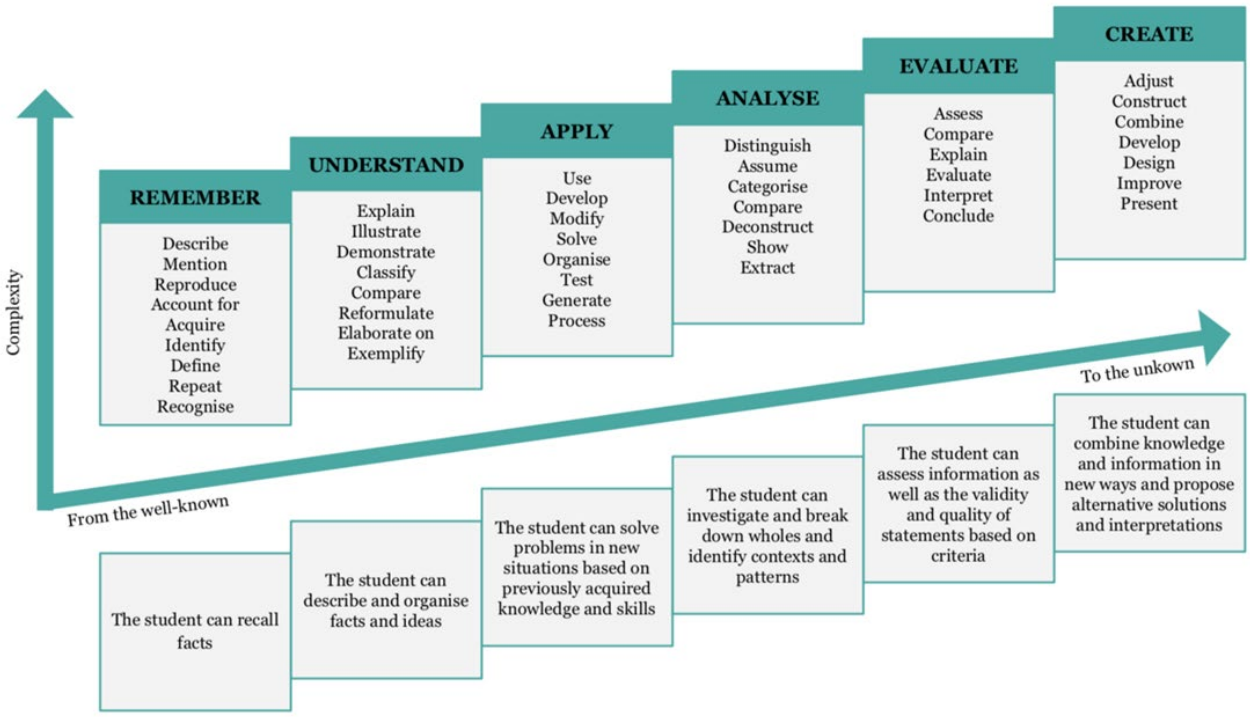
Learning objectives define the goal of learning – what the participant should be able to do after completing the learning, they are foundational to learning, guiding the development and content of courses and learning modules.

Creating effective learning objectives is crucial for structuring educational content and ensuring that learners achieve desired outcomes. Bloom's Taxonomy, a well-established educational framework, can help you design these objectives by focusing on different levels of learning. Bloom's Taxonomy[1] categorises cognitive learning into six progressive levels, each requiring more cognitive processing than the previous one:

- Remember (recall facts and basic concepts)
- Understand (explain ideas or concepts)
- Apply (use information in new situations)
- Analyze (draw connections among ideas)
- Evaluate (justify a stand or decision)

[1] Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain. New York: David McKay Company.

- Create (produce new or original work)



Bloom's cognitive taxonomy, prepared based on:
Anderson, L. W. and Krathwohl, D. R., et al (Eds..) (2001) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Allyn & Bacon. Boston, MA (Pearson Education Group)
Bloom, B.S. and Krathwohl, D. R. (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals*, by a committee of college and university examiners. Handbook I: Cognitive Domain. NY, NY: Longmans, Green

Following the Bloom's taxonomy, determine what you want your learners to achieve by the end of the course. Are they expected to remember information, understand concepts, apply skills in real-world scenarios, analyse data, evaluate arguments, or create something new?

For each course goal, write clear and measurable learning objectives that specify what the learners will be able to do. When using Bloom's taxonomy, we use action verbs that correspond to the level that fits the learning:

- Remember: List, define, recall, identify, describe
- Understand: Summarize, explain, paraphrase, classify, compare
- Apply: Use, execute, implement, solve, demonstrate
- Analyze: Differentiate, organize, relate, compare, contrast
- Evaluate: Check, critique, judge, hypothesize, recommend
- Create: Design, assemble, construct, conjecture, develop

Step 2: Develop or identify the technological infrastructure

For the M.Sc. and Master courses, DigiWind will utilise the Learning Management System (LMS) of each Higher Education Institute (HEI), which can be listed as:

- DTU Learn, Brightspace
- TUD, Brightspace
- NTNU, Blackboard
- PG, Moodle
- TUS, Moodle

For the lifelong learning modules, the DigiWind Virtual Campus will be leveraged as the main platform for course delivery. A viable option for the Campus is the Microsoft Community platform that provides reliable and secure access for large-scale, mobile-based communities.

Additionally, DigiWind includes extensive investment in robust IT infrastructure to ensure that both students and faculty have reliable access to high-speed internet and necessary hardware – make sure to check the capabilities in your institute while designing the modules.

Step 3: Design interactive and engaging content

Develop courses using a mix of text, videos, interactive simulations, and quizzes to cater to different learning styles – or team up with DigiWind internal or external digital learning vendors. Feel free to reach out to other educators within the consortium for feedback and change of best practices along the way.

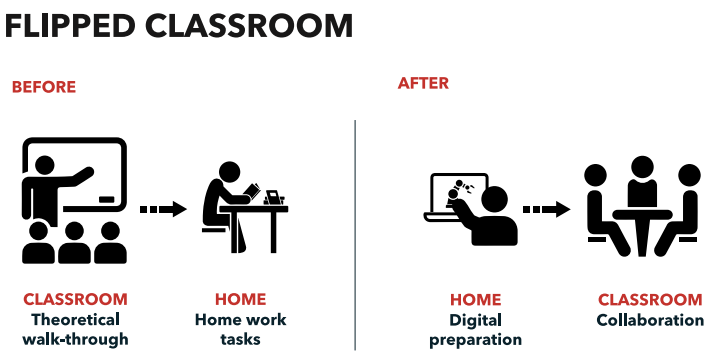
Plan your course content and activities to meet each learning objective. This alignment ensures that all parts of your teaching are focused on helping students meet the desired outcomes.

Step 4: Foster interactive learning environments

Try to implement tools that facilitate student interaction, such as discussion boards, group projects, and peer review systems that can be run both synchronously and asynchronously.

Synchronous elements can include live lectures, talks and webinars, virtual office hours, and real-time discussions to create a more engaging and dynamic learning experience.

Asynchronous elements can include transforming the theoretical lectures that used to be in the classroom into digital learning sessions with explained theory combined with interactions. This way, the formerly synchronous physical lecture becomes asynchronous, enabling a transformation of the practical, “homework” part. If the students have gone through the theoretical walk-through before meeting in class, the synchronous in-class time can be focused on collaboration, asking follow-up questions to the teacher, and other human interactions. See the flipped classroom illustration below.



Integrating synchronous and asynchronous elements in DigiWind courses is highly recommended where applicable, as it provides students various options to interact with the course content, as well as each other, and inclusive to all types of diverse learners.

Step 5: Implement assessment and feedback mechanisms

Good teaching also involves listening and acknowledging the students' perspective to see where they are in their understanding and tailor the teaching accordingly – also providing them the best feedback[2].

Use different assessment techniques, from traditional exams and quizzes to digital portfolios and peer assessments, to accurately measure student learning in an online/hybrid environment. The most suitable technique depends on various factors, including the course content, the number of students, and the specific learning outcomes being targeted. For example, large (online) classes might benefit from automated quizzes and (online) exams for efficiency, while smaller, project-based courses might find (digital) portfolios, project reports or peer assessments more effective in capturing the level of student understanding. Additionally, the nature of the subject matter (whether it's theoretical or practical) will also influence the choice of digital assessment methods, such as using simulations for practical skills or discussion forums for critical thinking exercises.

Ensure that the methods you plan to use for assessing learners align with your objectives. For instance, if your objective is for learners to evaluate, your assessment should require them to critique or make judgments, not just recall facts.

Although the methods are recommended to be tailored to the course individually, here are the fundamental principles to be followed within DigiWind courses of all levels:

[2] UDTU What is good teaching, 2022. Technical University of Denmark

- The assessment of the student's performance must take place on the basis of the learning objectives specified for the course/ project. (See Section 4 for further details on learning objectives)
- Students must always be assessed and graded individually, also in a group exam or a group report
- Grades are confidential information to each student

Additionally, as the educator, also ensure that students receive regular, constructive feedback (through digital means), enhancing their learning and development. Utilise tools such as online grading systems, automated feedback on quizzes, and personalized comments on assignments to provide timely and detailed feedback. Peer-to-peer feedback is also a useful method as it activates each of the student as an additional source of learning. Incorporate virtual feedback sessions, such as video calls or live chat, to offer more personalized and immediate responses to student queries and progress. Combining these digital methods with occasional real-time, face-to-face feedback sessions can further support students by allowing for deeper discussions and clarifications, thereby fostering a more comprehensive and supportive learning environment.

Step 6: Evaluate to ensure quality & innovate further

Regularly review and update digital courses to ensure they meet quality standards and remain current with disciplinary advancements. This includes periodically revising course content to incorporate the latest research, industry trends, and technological innovations. Get periodic feedback from students and colleagues to identify areas for improvement and ensure the material is both relevant and engaging. Here are a few suggestions on how to design periodic feedback activities to you as the learning facilitator:

- Assign feedback persons, per course / per module / per lecture / per activity
- Collect short answers on muddy points & insights (can be facilitated in the LMS)
- One-minute papers or digital entries (what did you learn?)
- Short quizzes

Additionally, stay informed about new digital tools and educational technologies that can enhance the learning experience, and be prepared to integrate these tools where appropriate. By maintaining a cycle of continuous improvement, you can ensure that your digital courses provide the highest quality education and remain aligned with the evolving needs of the discipline and the students.

For the final assessment of the course material and yourself to see what went well and what can be improved for the next iteration, feel free to take inspiration from the Evaluation templates provided:

- Evaluation of the Course Content & Material – Appendix I
- Evaluation of the Teacher – Appendix II

Step 7: Train the trainers of today and tomorrow

Offer advice and mentorship to support continuous professional development for your institution and to the rest of the DigiWind consortium to learn how to create and deliver effective digital content and utilise digital tools. It is strongly advised, if not yet established, to create support teams per institution consisting of instructional designers, IT specialists, and pedagogical experts to support DigiWind members in developing and implementing digital courses.

3 Further Recommendations for "Good Digital Learning"

These recommendations are designed to enhance engagement, retention, and the overall learning experience to meet the diverse needs of learners in DigiWind. By understanding the target audience and integrating these strategies, DigiWind educators can create compelling and impactful digital learning environments that address various learning styles and preferences.

3.1 Tell stories

Learning is about imparting knowledge. It's crucial to consider the target audience when developing learning materials, digital or otherwise. Investigate who your audience is, how they learn best, their needs, and what motivates them, then decide on the means to reach them.

Scenario- and story-based learning aids faster understanding and learning, as people better learn and remember experiences and stories. This approach is more engaging, providing a broader understanding, context, and a narrative thread through the learning.

Scenario- and story-based learning is effective in motivating learners to acquire complex skills like problem-solving, collaboration, and creativity, essential in addressing some of the world's significant challenges.

3.2 Break down the learning into smaller chunks

Breaking content into smaller information chunks, also referred to as Micro Learning, allows participants to engage with content whenever convenient. This creates intensive learning environments that are memorable and keep participants motivated, even if with short attention span.

This learning approach aligns with how we typically seek information today, allowing participants to progress at their own pace.

3.3 Motivate

Motivation is crucial at various levels in teaching others. It's important to motivate within the learning and content that participants go through, and in the context surrounding the learning. Incorporating motivating elements like digital technology,

interaction, and gamification in learning content doesn't necessarily aid learning directly but can motivate in other ways – such as making the participant feel important, understood, taken seriously, and listened to.

3.4 “The more interaction, the better”

"The more interaction, the better" is a common myth in digital learning. Although it's true that participants generally learn more from teaching others, practicing, and discussing viewpoints than from passive reading and listening, the chosen interaction in learning should always be based on set learning objectives and the best ways to achieve them.

3.5 Get inspired by Games

Games and gamification are not the same. Games refer to actual games, whereas gamification – or gamified learning content – means incorporating game-like elements into learning, such as setting up challenges and scenarios and rewarding desired behaviour with badges, stickers, or points.

When developing digital learning, working with gamification can make the learning content more attractive for participants to go through. Game elements also enhance learning and performance if they are useful and relevant. Gamified content keeps participants engaged, increases positive emotional responses, and allows for a shift from extrinsic to intrinsic motivation.

3.6 Mix learning methods

Blended Learning describes mixing various learning platforms, didactic approaches, and methods, such as e-learning, classroom teaching, practical exercises, and VR.

Experts suggest blending digital learning with classroom instruction when learning objectives can benefit from it. Some objectives are best achieved through digital instruction, while others are better suited for physical, practical exercises or discussions with others. Mixing learning methods motivates participants to learn more than classroom or digital learning alone.

3.7 Choose the right technology

Never choose technology for its own sake. The chosen technology should support the learning objectives, taxonomy, and content of the learning, not the other way around.

While technology offers many new opportunities, it's crucial to consider how many participants will undergo the digital learning and what technology will support the desired learning situation.

It's easy to be dazzled by the latest technology, but just because VR glasses seem innovative and groundbreaking doesn't mean they're the best fit for the learning. It's important to consider the target audience: who are they? How many participants will undergo the learning? Are they accustomed to using technology?

If the learning is lengthy and involves many participants, it may not make sense to be confined to VR glasses. It's uncomfortable to be in VR glasses for more than 10-15 minutes, so the duration of the learning also plays a role in the technological decision.

If training involves dangerous situations or building emotional competencies such as empathy, then VR can be highly effective, offering the best conditions for getting up close to a situation, practising, and truly empathising.

3.8 Examples & Inspiration for Digital Learning

Digitalising parts of the curriculum for M.Sc., Master courses, as well as lifelong learning modules, can enhance accessibility, flexibility, and engagement. Here are some examples and inspiration on which parts could be particularly valuable to digitalise:

Foundational knowledge and theory: Use elements e.g. videos, infographics and interactive elements and quizzes to present fundamental concepts, making them easier to understand and more engaging. Authoring tools such as Rise 365 are easy and useful tools to create digital learning modules. Learn more: (https://www.articulate.com/360/rise/)

Interactive tutorials and simulations: Develop interactive tutorials, such as Jupyter notebooks and software tutorials (e.g., with voice-over guidelines) that allow learners to practice new skills in a simulated environment.

Scenario-based learning: Incorporate virtual scenarios to help learners apply knowledge in real-world contexts, enhancing decision-making and problem-solving skills.

Assessments and quizzes: Use digital platforms for conducting quizzes and assessments that can automatically grade and provide instant feedback to learners, saving time and improving learning outcomes. By an inductive learning approach, the learners start by exploring unknown knowledge and then in the feedback the theory are incorporated, which is the opposite of a deductive learning approach.

Virtual collaboration tools: Facilitate group projects through digital platforms that enable document sharing, real-time editing, video conferencing, and collaborative brainstorming.

Discussion Forums and Chat Rooms: Create online spaces where learners can discuss ideas, share insights, and solve problems together, fostering a sense of community.

DigiWind Virtual campus, as well as additional LMS platforms across the consortium are designed to facilitate such activities, so the educators are encouraged to leverage that in the teaching.

4 Additional Requirements and Best Practices

In addition to the core principles of course development such as constructive alignment and effective use of digital media, there are several additional requirements and best practices that are crucial for the successful execution of DigiWind educational initiatives. This section will address the operational aspects that support the content side of course development. Key considerations include the co-development of courses in terms of intellectual property rights and revenue sharing arrangements.

4.1 Institute Level Requirements

Particularly for the DigiWind M.Sc. and Master courses, there are specific guidelines to be complied by each institute. Helpful list of information can be found below:

- DTU:
    - Learning Lab https://learninglab.dtu.dk/courses-and-events/udtu
    - DTU's video platform Panopto https://learninglab.dtu.dk/tools/video-in-teaching
- TUD:
    - Generic material on didactics (design, develop, teach, assess & grade) https://www.tudelft.nl/teaching-support/didactics
    - Material by TU Delft Extension School for Lifelong learning, online courses (plan, produce, run evaluate): Online Learning HUB – TU Delft online learning community
- NTNU:
    - Plan, administrate and evaluate teaching https://i.ntnu.no/planlegge-og-gjennomfore-undervisning
    - DriveX - an online course in creating online courses
- PG:
    - Rules for creating, conducting, and terminating study programs Rector's Order No. 58/2023 (November 29, 2023)
    - procedures for study programs at Gdańsk University of Technology. Rector's Order No. 23/2021 (April 26, 2021)
    - Complements learning outcomes in various resolutions Senate Resolution No. 288/2015/XXIII (June 17, 2015)

4.2 Co-development of Lifelong Learning modules

Intellectual Property and copyright regarding the course materials: All the course materials (including slides, videos and other digital materials, as well as recording of the lecture and transcripts) are copyright protected by the delivering institution. In DTU, it is owned by the lecturer. In TUD, the employer, rather than the author, holds the rights to the work, unless a specific agreement has been made. The author keeps the moral rights. For final details and decisions regarding copyright and licences, DigiWind consortium agreement is to be consulted.

Unless otherwise agreed:

- The materials and slides can be shared among the co-developers in a non-reproducible format before the lecture *only* for content alignment with the rest of the modules, and *only* for internal purposes among the course organisers - not to be shared further.
- The course materials will be presented by the lecturers themselves and the students will see the slides and other materials for the first time during the lectures.

- Sharing the course materials after the lecture is up to the lecturers themselves. An explicit consent shall be obtained. Agreements on consent shall be filed in the DigiWind Teams site.
- Course contributions between DigiWind partners must be agreed upon prior to implementation of the course, i.e. whether the contributions are covered by internal DigiWind resources or if there should be an element of revenue sharing.

Please note that non-compliance to intellectual property and copyright framework stated above will constitute a breach of DigiWind Consortium Agreement.

The User and Technical Requirements for DigiWind virtual campus (DigiWind Deliverable 2.4) will further detail the standards for course material formats and access authentication / authorization across the co-developers of courses.

Budget: While pricing the courses, it is the responsibility of the main host institution to consult with the co-developers to assess the necessary cost of delivery (e.g., given hours per week, given EUR/hour). It is possible to transfer the resources within DigiWind

For the communications and collaboration within DigiWind in general: Please include the project coordinator Tuhfe Göçmen (DTU), coordinator WP4 support Karsten Kryger, and WP4 lead John Cosgrove in all the communications regarding DigiWind Lifelong Learning related questions and requests, including (albeit not limited to) co-development of modules within the project.

4.3 Further Iteration(s) of the Standard Operating Procedures

In the DigiWind campus, we plan to categorise the offerings systematically. This categorisation system could be a part of the next iteration of the Standard Operating Procedures (SOP). By developing a clear, structured system, we can ensure that all courses are easily navigable and that students can find the content most relevant to their needs and interests. Ideally, this system would include a step-by-step guide or flowchart. By answering a series of questions, one could arrive at a recommended digital learning methodology suitable for a particular course, enhancing both the user experience and the educational outcomes.

Further iterations of the SOP should also include more concrete elements developed by individual partners. These could encompass tables listing specific, preferred formats, technologies, evaluation methods, and durations, depending on various factors. Such factors might include

- the scope (Lifelong Learning or Master /M.Sc.),
- delivery format (online, hybrid, or physical),
- number of participants,
- Bloom's taxonomy levels,
- the outcomes of the step-by-step guide procedure mentioned above.

This structured approach will help ensure consistency across the DigiWind campus and facilitate the delivery of high-quality, tailored educational experiences for all learners.

Appendix I - Evaluation of the Course Content & Material

A template for DigiWind Course content and material evaluation is presented below. It can be further adjusted per specific needs of the course, educator(s) and/or hosting institution.

Content Relevance and Quality

- Please rate the relevance of the course to the current trends and advancements in the wind and energy systems industry (1 = Not Relevant, 5 = Highly Relevant).
- Please rate the clarity of the course objectives and their alignment with the content provided (1 = Not Clear, 5 = Very Clear).
- Please rate how well the course material explains the concepts stated in the course content (1 = Not Well, 5 = Very Well).

Engagement and Interactivity

- Please rate the engagement level of the multimedia elements (videos, animations, infographics) used in the course (1 = Not Engaging, 5 = Very Engaging).
- Please rate the extent to which the interactive elements (quizzes, simulations, discussion boards) enhanced your understanding of the material (1 = Not Helpful, 5 = Very Helpful).

Clarity and Organization

- Please rate the clarity and structure of the course content (1 = Not Clear, 5 = Very Clear).
- Please rate the logical organization and ease of following the learning modules (1 = Not Organized, 5 = Very Organized).
- Please rate the clarity of instructions for assignments / exercises and activities (1 = Not Clear, 5 = Very Clear).

Feedback and Assessment

- Please rate the effectiveness of the feedback you received on your assignments / exercises and activities (1 = Not Effective, 5 = Very Effective).
- Please rate the accuracy of the assessments (exercises, assignments, quizzes, exams, projects) in reflecting the material covered in the course (1 = Not Accurate, 5 = Very Accurate).

Support and Resources

- Please rate the helpfulness and relevance of the additional resources (readings, links, tools) provided (1 = Not Helpful, 5 = Very Helpful).
- Please rate your satisfaction with the support provided by instructors and technical staff (1 = Not Satisfied, 5 = Very Satisfied).

Technological Tools and Platforms

- Please rate the user-friendliness of the digital platforms and tools used in this course (1 = Not User-Friendly, 5 = Very User-Friendly).
- Please rate the promptness and effectiveness of resolving any technical issues you encountered (1 = Not Effective, 5 = Very Effective).

Overall Experience

- Please rate the overall benefit you gained from the course (1 = Not Beneficial, 5 = Very Beneficial).
- What aspects of the course did you find most beneficial? (Open-ended)
- What improvements would you suggest for future iterations of this course? (Open-ended)
- How likely are you to recommend this course to other students interested in wind energy (1 = Not Likely, 5 = Very Likely)?

Appendix II - Evaluation of the Teacher

A template for collecting feedback on the educator of DigiWind Courses is presented below. It can be further adjusted per specific needs of the course, educator(s) and/or hosting institution.

(Please rate each item on a scale from 1 to 5 (1 = Strongly Disagree, 5 = Strongly Agree))

Clarity of Instructions

- The teacher provides clear and understandable explanations of complex concepts.
- The instructions for assignments and activities are clear and easy to follow.
- The teacher uses digital tools effectively to enhance understanding.

Engagement and Interaction

- The teacher engages students through stimulating and interactive teaching methods.
- The teacher effectively uses digital platforms to facilitate student interaction and engagement.

Availability and Support

- The teacher responds to student inquiries in a timely manner.
- The teacher provides adequate office hours or virtual consultation times for additional support.

Feedback and Assessment

- The teacher provides constructive feedback that helps improve understanding and performance.
- The feedback on assessments and assignments is timely and detailed.
- The teacher uses a variety of assessment methods to gauge student learning effectively.

Motivation and Encouragement

- The teacher effectively relates course content to current trends and advancements in the wind and energy systems industry.
- The teacher clearly outlines expectations and course policies.

Course Management

- The teacher effectively integrates various digital tools and resources into the course.
- The teacher manages the online learning environment efficiently, ensuring smooth course progression.

Overall Experience (open-ended)

- What did you find most effective about the teacher's approach to this course?
- What aspects of the teacher's instruction could be improved?
- Can you provide an example of how the teacher's feedback helped you improve your understanding or performance?
- Do you have any additional comments or suggestions for the teacher?