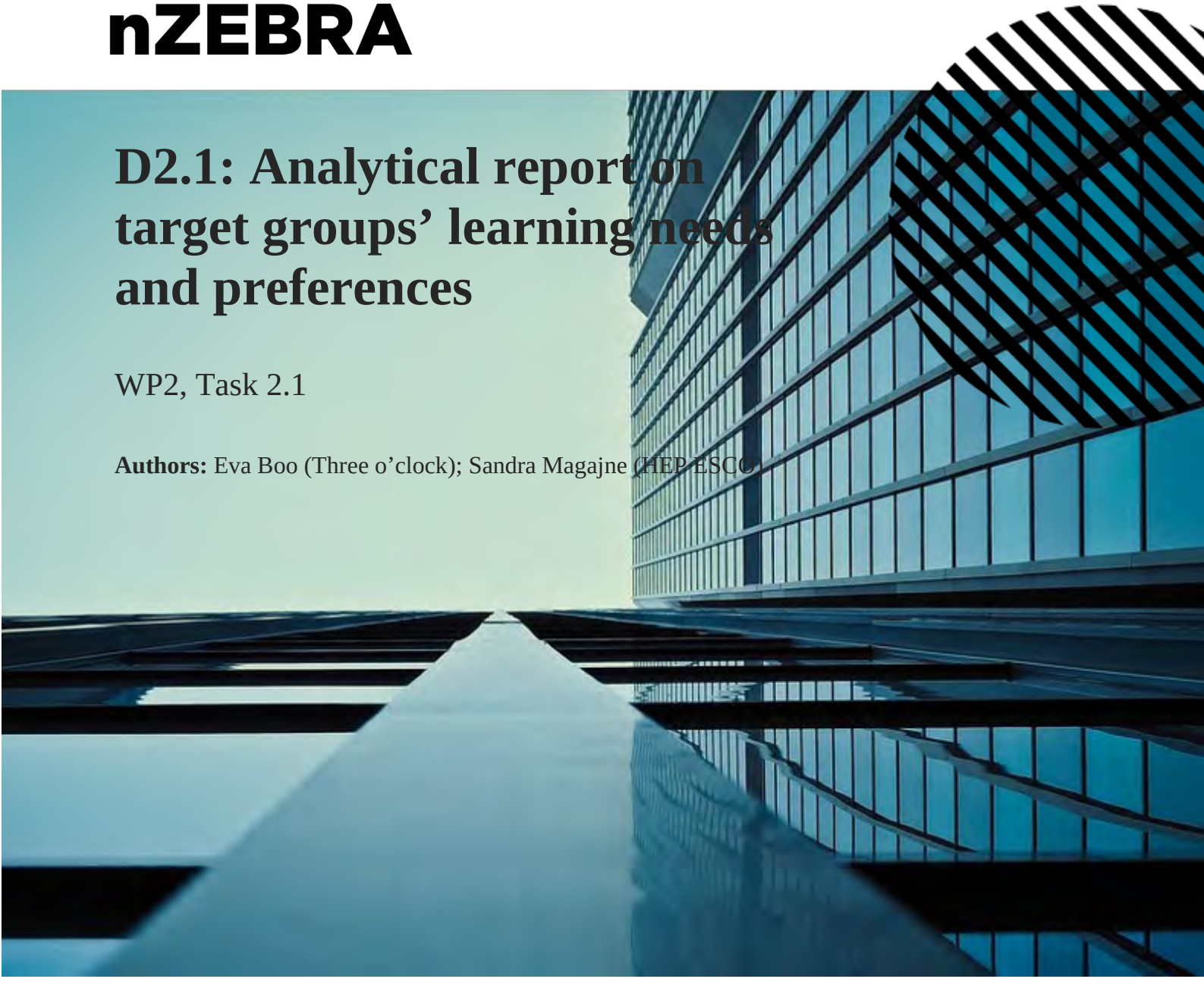
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nZEBRA



D2.1: Analytical report on target groups' learning needs and preferences

WP2, Task 2.1

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Abbreviations and acronyms

Acronym	Description
BEM	Building Energy Model
BIM	Building Information Modelling
EU	European Union
ESCO	Energy Service Company
GA	Grant Agreement
LCA	Lifecycle analysis
LCC	Lifecycle cost
MOOC	Massive Open online courses
nZEB	nearly Zero Energy Buildings
RES	Renewable Energy Sources
UAE	United Arab Emirates
WP	Work Package

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Executive summary

The nZEBRA project aims to create a flexible student-centred blended learning adapted to modern learning patterns. The main contribution of this deliverable is to understand the educational needs in upskilling and training by identifying the main learning objectives together with student required in the nZEBRA course.

The mix of qualitative and quantitative methods, including an online survey, interviews and focus groups, carried out in the first months of the nZEBRA project have produced a set of guidelines for the creation of the content of the course. This field research consisted of the first step of the co-creation process with university staff and students. Different activities will be organized to co-create and/or test the course and integrate the feedback before the end of the project.

A global overview of the results indicates that the course should be multidisciplinary offering a wide and holistic view of climate neutral buildings. Generally, all the options presented in each question were considered important by respondents with mean and medians higher than half of the points.

Concerning the content of the course, the areas were the most frequent value was 100 were: Electricity and energy, project management, environmental studies and digital tools. This reflect that these topics were considered vital for an important part of the respondents, as they considered that these topics should be the main topic of the course. The areas obtaining higher median (70) are: building and structural design, architecture and urban planning, eco-design and circular economoy, electricy and energy, environmental studies and digital tools. Representing the areas where more than 50% of respondents considered that the topic should be covered to a large extent (0=not covered at all, 100=main topic of the course).

Regarding specific technologies for climate neutral buildings, the technology with higher mean and most frequent value was smart grids and demand side management, being the only one with a most frequent value of 7. There were four technologies considered important by respondents with most frequent values of 5. These are district heating, batteries, thermal storage and building façades, which should be also considered in the course.

Considering renewable technologies the technologies with higher mean and most frequent value were wind and solar, being solar the only one with a most frequent value of 7 and higher mean with 6. Besides, the technologies considered more important by respondents with most frequent values of 5, besides solar with 7, are biofuels, biogas, biomass and wind, which should be also considered in the course.

When asking about the preferred format of the course, the top one option was the practical training with hands-on sessions with a total of 74% respondents choosing this option. The two most preferred options were thematic workshops with 53% and co-creation workshops with 55%. Webinars or MOOCs fully digital options have been the least preferred options with 27% and 23% respectively. Overall, a mix of in-person training and virtual materials was considered the most adapted form of training.

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In short, the main recommendations for the course creation are:

	Thematic areas	**Technologies**	**RES technologies**	**In-person vs virtual training**	**Typology of activities**
Top priority	- Electricity and energy - Environmental studies - Digital tools	- Smart grids and demand side management - District heating - Thermal storage	- Solar - Wind - Biomass	- In-person training	- Hands-on sessions - Thematic workshops - Co-creation workshops
Also important	- Project management	- Batteries - Building façades	- Biofuels - Biogas	- virtual materials allowing flexibility	- videos and online activities - competitions among students - job opportunities description

Keywords

Field Research, Learning needs, students' co-creation, educational course, survey, interview, focus group

1 Introduction

1.1 Purpose, scope, and audience

According to the Description of Action, task 2.1 contributes to the creation of the flexible student-centred blended learning adapted to modern learning patterns. The main contribution of this task is to understand the educational needs in upskilling and training by identifying the main learning objectives together with student required in the nZEBRA course.
Moreover, the objectives of Task 2.1 related to the whole WP2 are to:

1. Adapting target group needs analysis to current and novel trends and demands using field research methods, incl. Design-thinking sessions, a survey, focus groups, interviews. These will lead to defining concrete core needs and challenges and learning pathways which the project course will address efficiently.

2. Defining general learning objectives and outcomes of the course, together with relevant didactics, assistive digital tools, educational forms and ratio of in-class and online sessions. The results of the field research will be reflected here.

The rest of the objectives of the WP2 will be treated in subsequent tasks of the WP2. The results of the field research carried out in the first months of the nZEBRA project at the EU level are outlined in this deliverable.

1.2 Partners' contributions

The following Table 1 lists the main contributions of project partners in this deliverable.

Table 1: Contribution of partners

Beneficiary name	Contribution
3OC	Methodological approach, drafting of deliverable, survey structure
HEP ESCO	Interviews and focus groups
HH	Reviewer

1.3 Relation to other activities in the project

Table 2 below lists how this deliverable relates to other activities (or deliverables) in the project, and which should be considered for further understanding.

Table 2: Relation to other activities in the project

Related WP / task / deliverable	Relation
WP3	It will provide inputs for the creation of the content for the nZEBRA course, as if they were requirements for the design of the course.

2 User-centred educational framework

2.1 Rationale for a user-centred approach

The rationale for a user-centred approach to educational framework and intense blended course development is grounded in the recognition that successful energy transition in general and climate neutral buildings in particular depends on widespread adoption and skillful engagement from relevant stakeholders across energy and construction value chains in buildings that include different existing infrastructures, operations, and behaviour patterns.

The user-centred approach ensures that the educational framework composed of micro-credentials is tailored to the specific needs and interests of the target audience. By understanding their knowledge level, concerns, and motivations, the micro-credentials can be designed to provide information that is relevant and meaningful to them, increasing their engagement and willingness to participate. For example, energy producers, distributors, retailers, researchers, teachers, students, energy users, regional energy agencies and local authorities have specific and shared needs, preferences, and aspirations in upskilling to meet the demands of the sector and industry they operate.

Climate neutral buildings require technological upgrades but also changes in behaviour and lifestyle choices, it is not useful to change the windows for more efficient ones if the people living in the apartment open the windows when it is too warm inside during winter. A user-centred approach identifies the barriers and drivers for behavioural change and designs educational content that addresses these factors. This can lead to more successful adoption of sustainable energy practices and technologies. Involving the target audience in the development process empowers them to take ownership and responsibility for training and further uptake of acquired competencies. When individuals feel their voices are heard and their needs are considered, they are more likely to become active participants and advocates for sustainable energy solutions in buildings.

Climate neutral buildings can sometimes face resistance due to skepticism or misconceptions, because measures are often expensive and not a priority for citizens. A user-centred approach allows for the identification and addressing of these concerns, leading to greater acceptance and support for energy efficiency and local renewable energy initiatives. Also, different communities and demographics may have varying perspectives and priorities regarding climate neutral buildings. By embedding a user-centred approach in the co-development of an educational framework and micro-credentials it is possible to acknowledge and respect the diversity of needs, learning journeys and styles, as well as content, ensuring that educational micro-credentials are inclusive and accessible to all segments of the population.

2.2 Aim and objectives of the educational framework

The nZEBRA project will develop an intensive blended course in climate neutral buildings, based on micro-credentials. It will encompass topics related to nZEB, circular economy in construction, climate change adaptation, renewable energy systems... The course will address current educational needs of students and market demand for professionals in sustainable building performance, with field research undertaken at the beginning of the project, including surveys, interviews and focus groups. This process will be larger than a consultation process, involving students and professionals at different stages of the project to co-create the blended course. The participants in the co-creation

process are at the same time the target users of the course and will include student in scientific careers and master courses, as well as early researchers and technical professionals.

2.3 Innovative approach for content development

The nZEBRA project undertakes an innovative user-centred approach by proposing:

- Multidisciplinary team: a group of 4 EU universities with large experience in the sustainable building environment complemented by Three o'clock, a French agency specialised in participatory approaches to better address learning needs and challenges and a Croatian ESCO company, bringing in practical insights from the market.
- Blended learning based on micro-credentials. nZEBRA will develop an intensive short-term course with a combination of in-class learning and digitally enhance challenge-based assignments for individual and group work offering a flexible learning experience.
- Experiential learning: the digital part of the course will offer practical training using BIM and BEM software through challenge-based learning scenarios, use cases and real-life examples.

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3 Co-design process and methods

3.1 Methodology for co-design

The co-creation framework in the nZEBRA project will rely on partners' local networks using them as 'hubs' for co-creation, students, early career workers and long-experienced professionals will be contacted to participate in the process. The first step is user research, a process composed of tasks such as an assessment of the educational needs and upskilling gaps among the students and professionals and identification of the relevant topics and competencies. These tasks were implemented through quantitative and qualitative research methods and tools such as public surveys, interviews and focus groups. Some of the tasks were implemented both at the local/regional and international level whilst others were delivered only at the local/regional level. The results of this process are presented in this deliverable. Later steps of co-creation, as co-development and testing, will be documented in subsequent deliverables in the project.
In the following text, the methods are explained and discussed in more detail.

3.1.1 Public survey

A quantitative online survey was launched in December 2023 to assess and identify the needs and interests of target stakeholders. The total number of respondents was 107. The survey was opened for two months December 2023 and January 2024. The main purpose of the survey was to identify learning needs and skills gaps in the partners' local networks target population: France, Germany, Sweden, and Croatia. Question integrated a mix of socio-demographics, educational habits, and preferences related to university courses. The survey was conceived based on a literature review of skills' gaps and educational needs research in similar EU projects as IDAlert[1], ePLANET[2], RES4CITY[3] or SHERLOCK[4]. The survey included a total of 12 questions with an estimated time to complete the survey of 11 minutes. It needed to be short to catch the attention of the respondents. Questions were a mix of multiple choice, rating scale and Likert scale questions. There were two open-ended questions to have a mix of quantitative and qualitative research. When questions had multiple choice, random order was applied to avoid bias. The survey was structured in four main sections depicted hereafter:

- User Profile: country, professional background, current occupation
- Content of the course: technical fields, specific technologies, and renewable energies
- Format of the course: form of training and preference of typologies of courses

The questions featured in the survey are available in Annex 1: Online survey questions.

Profile of respondents
As introduced before the survey used the local networks of the partners Sweden, Germany, Croatia, and France. There was a small percentage of other countries, because the survey was also promoted in international LinkedIn groups and networks. The results are presented in the following Figure 1.

[1] http://idalertproject.eu
[2] https://www.eplaneth2020.eu
[3] https://www.res4city.eu
[4] https://www.sherlockproject.eu

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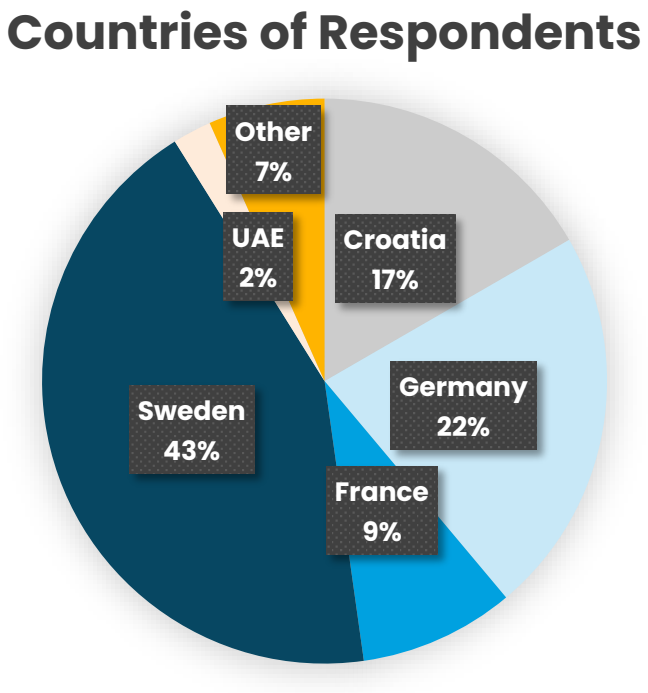


Figure 1: Countries of residence of the respondents

Regarding the background of participants, the vast majority (almost 90%) had a background in STEM.

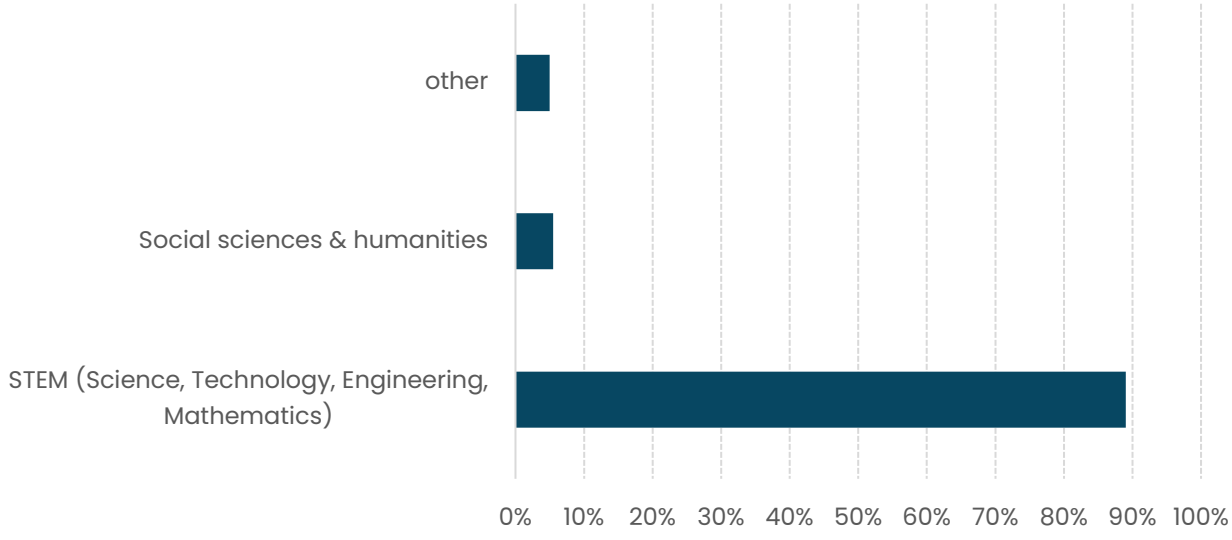


Figure 2: Background of respondents

Concerning the current occupation of respondents there was a mix of profiles among the respondents, with a bigger percentage of students, more than 50%. This allowed to differentiate the results per current occupation of respondents when necessary, having sufficient sample students/non-students.

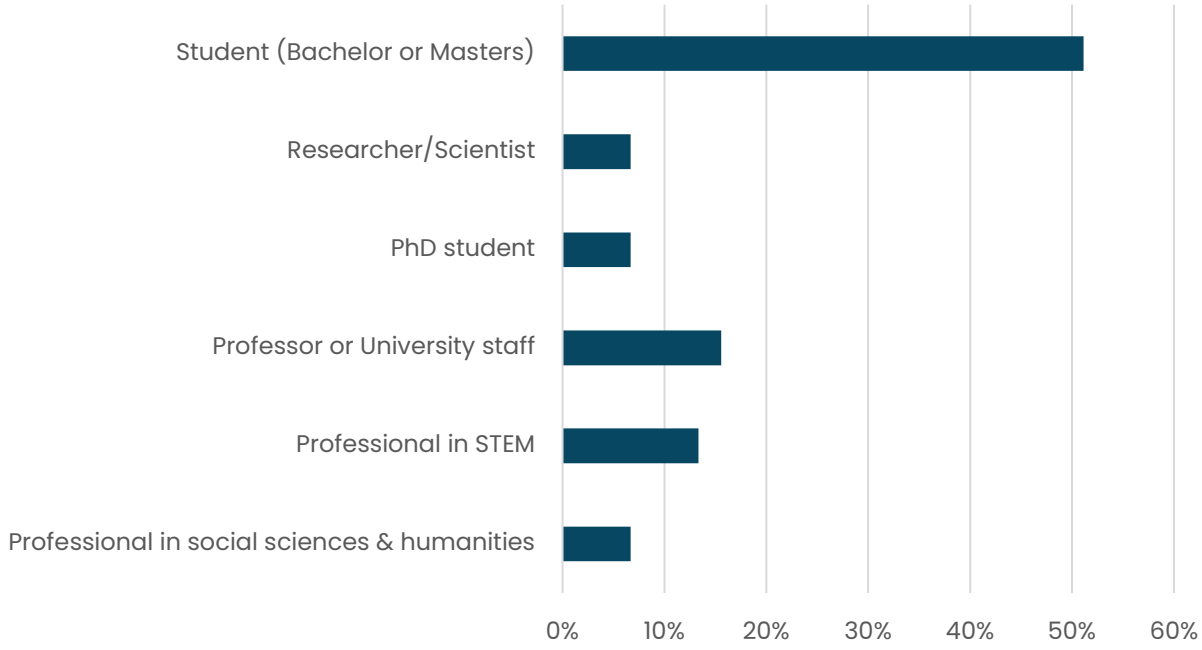


Figure 3: Current occupation of respondents

3.1.2 Interviews

Interviews were planned to complement the qualitative research in nZEBRA. Interviews targeted experts in the field with five thematic units with one question per unit.

1. Financing and business models
2. Project management
3. Environmental Social Governance, Social Sciences and Energy Efficiency
4. Digital tools
5. Electricity and thermal energy

It consisted of semi-structured interviews, with open-ended questions to allow experts to build their narrative according to their experience. The focus in this case was to provide direct insights from the market with most useful construction methods or most efficient electricity sources according to their experience. This way, inputs from interviews were complementary to the survey results.
In Croatia, 3 interviews were held, two with professionals and one with an HEI educator.

3.1.3 Focus group

A focus group was organised in January 2023 in Croatia with similar structure to the interviews around the same thematic areas. The focus group lasted one hour and a half and gathered nine experts and educators in the construction and energy fields. Results from the focus group provide direct insights from the market with main needs and problems in the climate neutral buildings area. This deliverable presents the needs assessment analysis for the climate neutral building course in nZEBRA.

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4 Needs assessment results

The results of the field research are presented as recommendations for the course creation independently of the method that was used for the data collection. The results are structured in two main sections:

- Content of the course: Information on what the course should focus on, the main topics and how important are these topics for the respondents.
- Format of the course: including information on the form of the course, the types of activities to be included and that respondents found more beneficial for them.

4.1 Content of the course

First, desktop research and discussions among the consortium lead to include this list of subjects to potentially be included in the course. The course aims to be multidisciplinary empowering students to deal with climate neutral buildings with the necessary skills to boost its development. For that the different thematic areas identified are listed here below:

- Financing options and business models. Planning, directing, organising, and controlling financial activities and business models linked to nZEB.
- Digital tools. Simulation tools and application development and analysis. BIM and others
- Environmental studies. Adaptation and mitigation strategies. Calculate risks and impact of climate change. CO2 emissions. Natural environment, wildlife, and biodiversity. LCA and LCC
- Social sciences. The study of human beings and the way they behave in groups and in relation to society
- Project management. Planning, managing operational activities in the construction of nZEB buildings
- Electronics and automation. all aspects related to sensors and monitoring of electronic equipment, machinery, and systems, including communication devices
- Electricity and energy. Energy and electricity generation, different energy sources focused on micro generation in the nZEB building. Design, maintain and operate different sources
- Eco-design, circular economy, material sourcing & supply chains. The study of the manufacturing of products in glass, paper, plastic, wood or other materials like stone, clay, artificial materials etc.
- Architecture and urban planning. The study of the art, science, and techniques of building design, encompassing the use and aesthetic considerations, including its integration with the urban context
- Building and structural design. The science of conceiving new building design respecting national and EU structural building codes.

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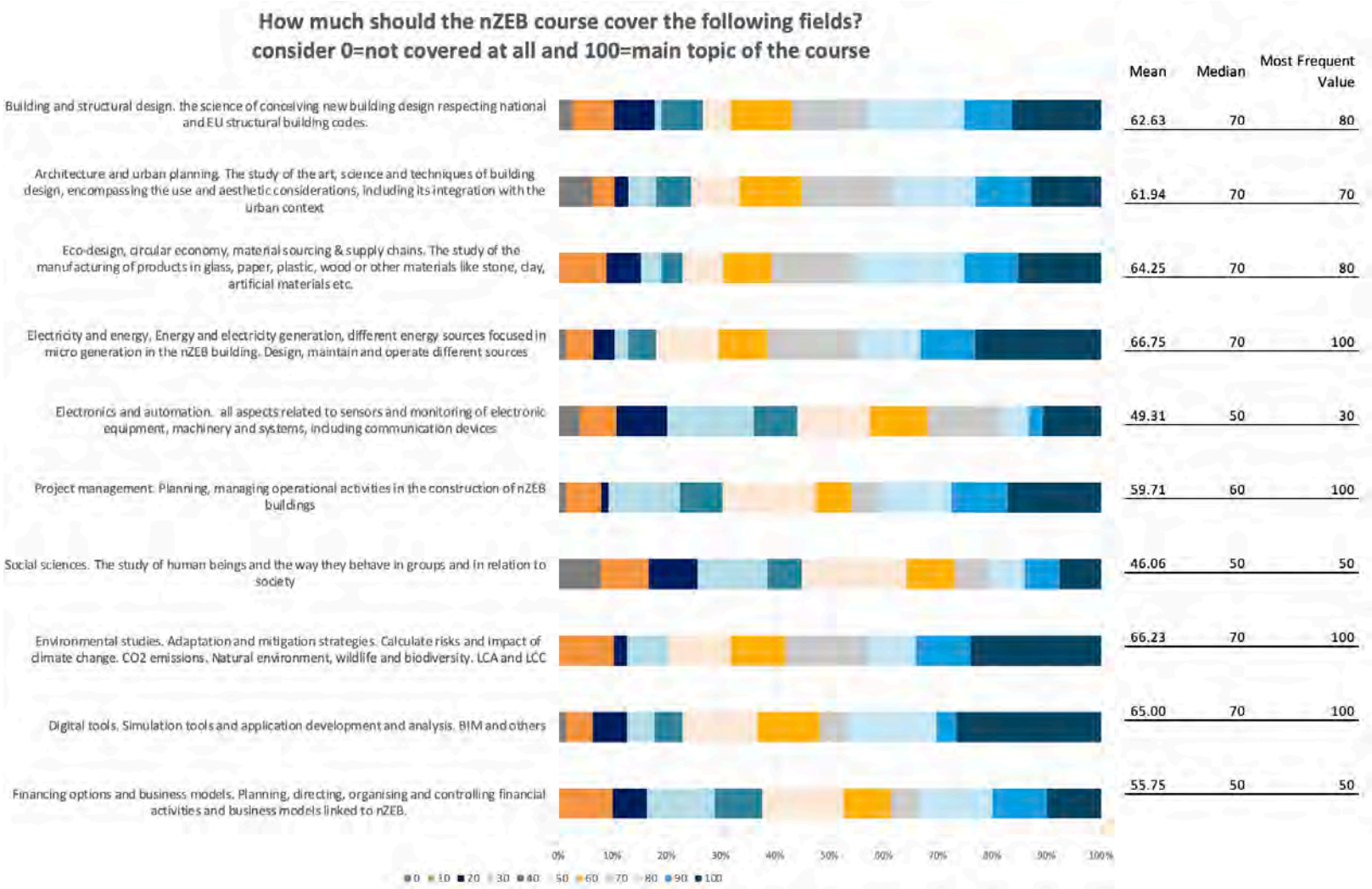


Figure 4: Content of the nZEBRA course – specific areas of knowledge

The results obtained allowed to gather the following conclusions:

- All areas obtained a median higher than 50, which reflects that respondents considered all areas important to be covered in the course.
- The areas obtaining higher median (70) are: building and structural design, architecture and urban planning, eco-design and circular economoy, electricy and energy, environmental studies and digital tools. Representing the areas where more than 50% of respondents considered that the topic should be covered to a large extent (0=not covered at all, 100=main topic of the course).
- The areas were the most frequent value was 100 were: Electricity and energy, project management, environmental studies and digital tools. This reflect that these topics were consider vital for an important part of the respondents, as they considered that these topics should be the main topic of the course.
- The focus group gave less importance to financing, project management or social science, with scores of 1-3, arguing that professionals would need an overall overview of these areas but not necessarily been experts on that matters.
- The focus group reinforces the importance of digital tools and electricity and energy with expert levels required for students in the nZEBRA course. Tools will allow students to master investment planning and optimisation of the different technical solutions, which is of upmost importance as per the many combinations possibles in nZEB buildings.

In short, the top three areas with higher mean, median and most frequent values (and support from interviews and focus groups) are:

- Electricity and energy
- Environmental studies
- Digital tools

Specific inputs for some of the thematic units were gathered through the interviews. They include recommendations from construction experts on specific technologies and market insights that should be taken into account for the course creation. These are summarised here below.

Financing:
Regarding the financing of building renovations according to the nZEB principle, there are several sectors that should be approached in different ways:

- public sector – the state should provide the funds for financing/co-financing these projects;
- commercial sector - own financing is an optimal model, either with independent funds or commercial loans;
- multi-apartment buildings, households (family houses) – these projects should be (co)financed through grants either from the EU funds, state funds or their combination.

The key factor in managing projects that aim to bring a building to the nZEB standard is the correct implementation of the first two steps:

1. Making the right investment decision.
2. Making a decision on the optimal set of measures to bring the building's properties to the level of energy efficiency and the share of energy from renewable energy sources that is financially, and energy justified.

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For this, the investor needs objective professional help. It is crucial to avoid choosing the cheapest measures or excessive measures whose price is disproportionately high compared to the achieved benefits.

Environmental studies
ESG is a game changer. It increased an interest in everything that is considered green, energy efficient and renewable. The European Union introduced sustainable financing and started with the taxonomy and ESG that it imposed on private companies. This is finally creating some movement in Croatia. Measures are starting to take place although this is not a new topic, it has been pertinent for 20 years. As for the involvement of professional engineers with experience, this may be an issue. Sustainability consultants are engaged and very often they are not technical professionals. It is necessary to go towards green certification, which is carried out by technical experts and ensures that check list is performed based on measurable indicators and that the buildings that are either built or renovated are in compliance with the district criteria. It is good that investments have intensified, and companies are gaining more value due to green investments but more professional education in this field is definitely required.

Digital Tools
Digital tools such as Building Information Modeling (BIM) software enable architects and engineers to create highly efficient building designs by simulating energy performance, daylighting, and thermal comfort. This helps optimize the building envelope, HVAC systems, and renewable energy integration to achieve net-zero energy targets. They enable iterative design optimization to achieve desired energy targets and building performance. Overall, digital tools streamline the construction process of nZEB buildings by enabling better design decisions, fostering collaboration and coordination among project stakeholders, facilitating the integration of renewable energy systems, and ensuring the quality and performance of the finished building. Digital tools in nZEB management often include comprehensive EMS/BAS platforms, energy monitoring and analytics software, predictive maintenance solutions, and occupant engagement platforms. Examples include Building Management Systems (BMS): building integrator, energy analytics, and occupant engagement. These tools provide a holistic approach to nZEB management, combining monitoring, control, analysis, and engagement functionalities to optimize energy performance and occupant comfort. Both for construction and management of nZEB buildings, digital tools are inevitable and necessary.

Electricity and thermal energy

Summary conclusion of recommended combinations of electricity and thermal energy resources and technologies:

1. Heat pump air air + monovolume Heat Pump air – water for water heating + photovoltaic power plant + local ventilation with recuperation (lowest investment)
2. Heat Pump air water with floor heating + monovolume Heat Pump air – water for water heating + photovoltaic power plant + local ventilation with recuperation (investment much higher but most comfortable heating available)
3. District heating which utilized RES as fuel (not fossil fuels) + photovoltaic power plant + local ventilation with recuperation.

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Regarding the focus on specific technologies, respondents where asked to give their opinion on:

- Smart grids and demand side management
- District heating
- Batteries
- Thermal storage
- Organic ranking cycle
- Building façades
- Special glazing
- Green roofs and walls
- Heat pumps

The results are presented in Figure 5.

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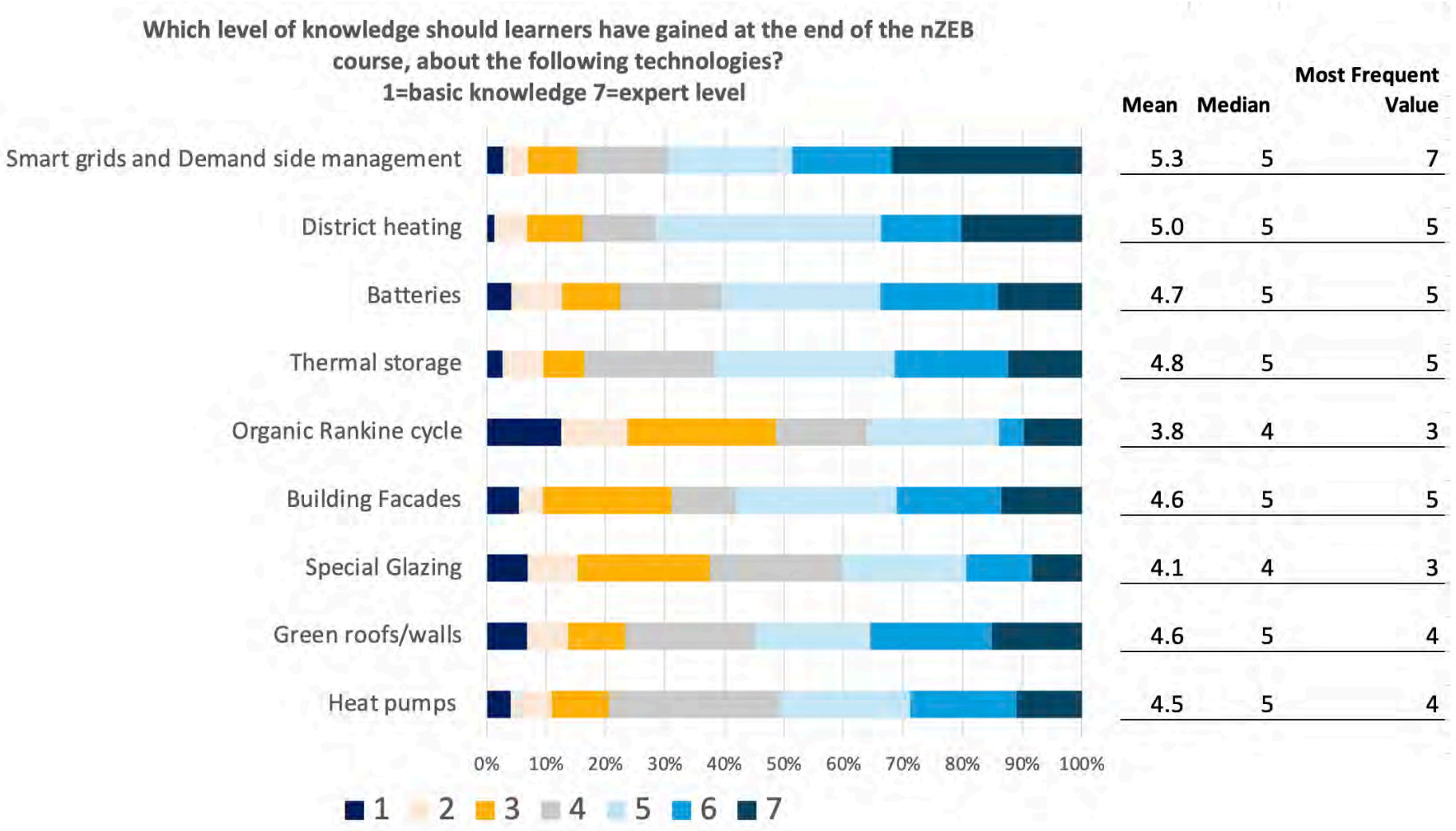


Figure 5: Content of the nZEBRA course – Specific technologies

The results obtained allowed to gather the following conclusions:

- Technologies gathered also good evaluations from respondents in this case, as the medians all among 4 and 5 (1=basic knowledge and 7=expert level). All of them with medians higher than 3.5, meaning that 50% of respondents considered that these technologies should be mastered by students in the course.
- The lower technologies considered were special glazing and organic ranking cycle, with lower means, medians and most frequent values (3).
- The technology with higher mean and most frequent value was smart grids and demand side management, being the only one with a most frequent value of 7.
- There were four technologies considered important by respondents with most frequent values of 5. These are district heating, batteries, thermal storage and building façades, which should be also considered in the course.
- In this case, no information from the focus groups or interviews was gathered.

In short, the top three technologies with higher mean, median and most frequent values (and support from interviews and focus groups) are:

- Smart grids and demand side management
- District heating
- Thermal storage

It will be important not to forget batteries and building façades, as these are considered important aspects in the course.

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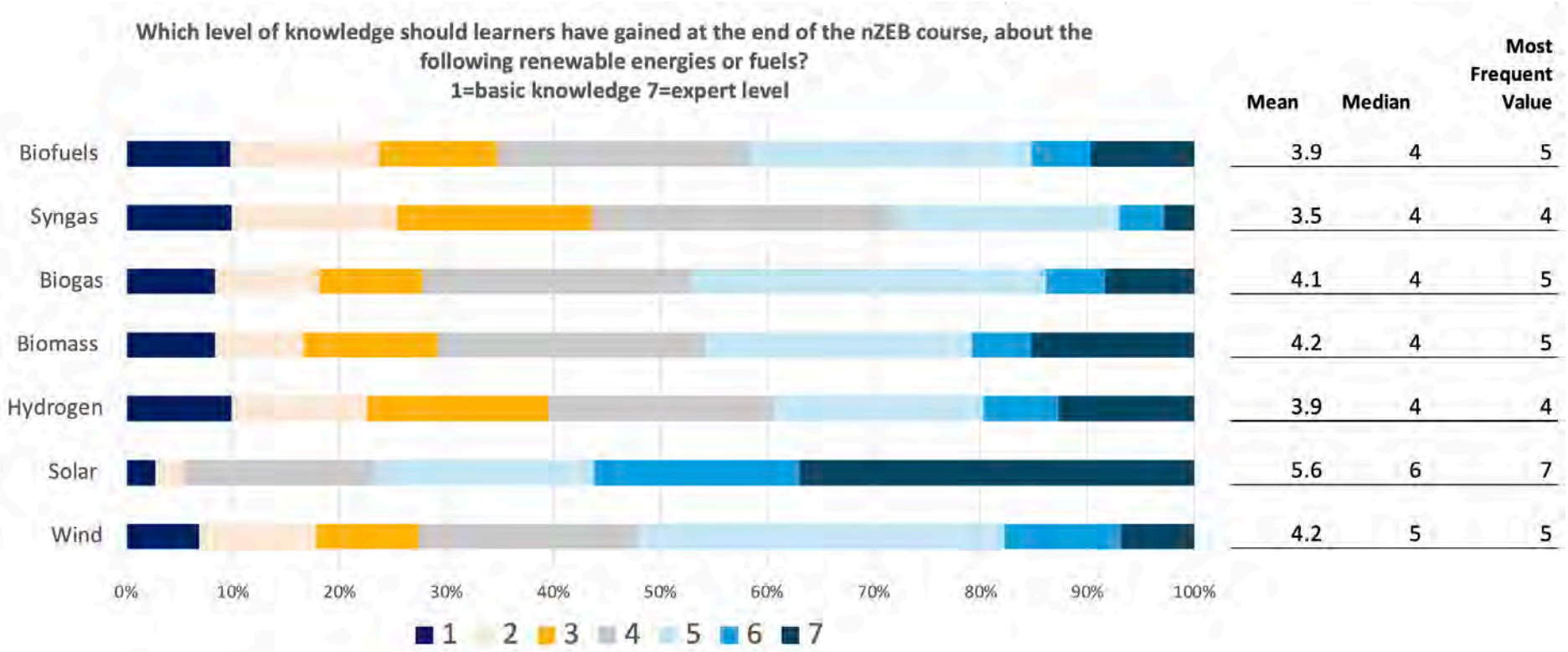


Figure 6: Content of the nZEBRA course – Specific RES technologies

The results obtained allowed to gather the following conclusions:

- Regarding renewable technologies similar results, all tecnologies were considered important with medians between 4, 5 and 6 (1=basic knowledge and 7=expert level). Medians all higher than 3.5, meaning that 50% of respondents considered that all these technologies should be mastered by students in the course.
- There was no technology with mean, median or most frequent value lower than half of the points (3.5).
- The technologies with higher mean and most frequent value were wind and solar, being solar the only one with a most frequent value of 7 and higher mean with 6.
- The technologies considered more important by respondents with most frequent values of 5, besides solar with 7, are biofuels, biogas, biomass and wind, which should be also considered in the course.
- In this case, no information from the focus groups or interviews was gathered.

In short, the top three RES technologies with higher mean, median and most frequent values (and support from interviews and focus groups) are:

- Solar
- Wind
- Biomass

It will be important not to forget biofuels and biogas as these are considered important aspects in the course.

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5 Format

Concerning the format of the course, the preferred option was a mix of both, virtual and in-person training, with a 60% of respondents opting for this option. Another interesting result is that when having to choose either one or another, in-person training was chosen by 32% of respondents rather than only 4% of virtual training.

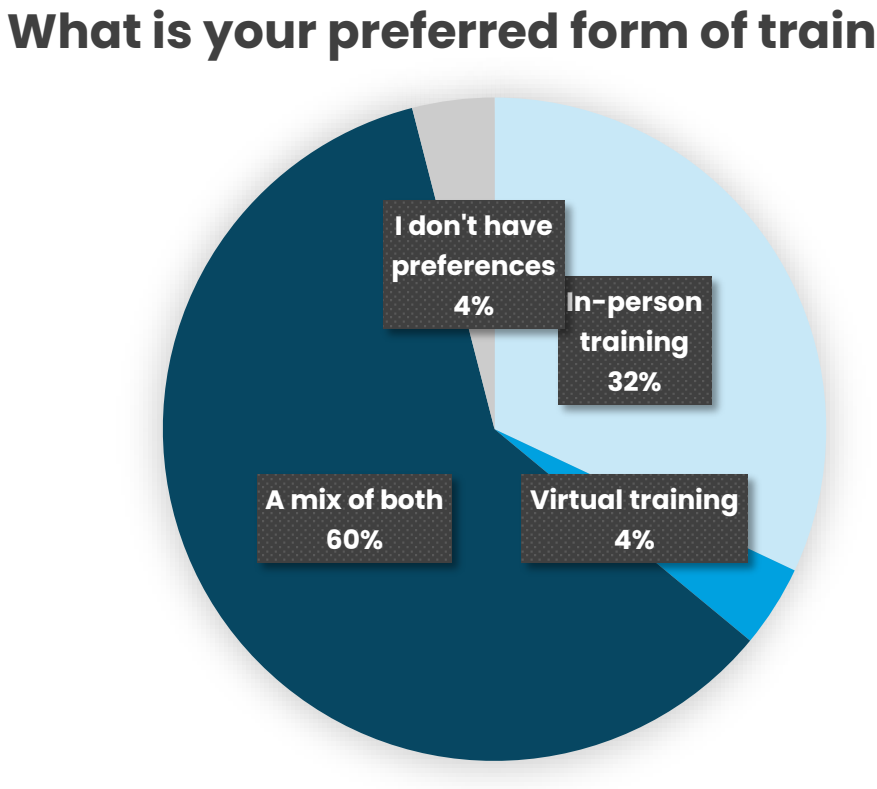


Figure 7: Preferred form of training by respondents

Open-ended questions regarding virtual vs. in-person training reflect also the preference of the in-person training with comments as "the personal contact is always preferable, because of the dialogues generated", "For me, the personal contact is very important, I cannot learn well with only virtual materials", " Personal education is in my opinion more efficient and faster than online education", "We, as students can experience, learn and even enjoy studying better in person and on campus".

To go more in-depth with the type of activities to be included in the course a list of options was presented to respondents:

- Webinar - Online live lectures
- Practical training - Hands-on sessions to apply data and tools
- Thematic workshops - Analyse a case study with its pros and cons to identify best practices
- Co-creation workshops - Find solutions for a specific issue within a collaborative group setting
- MOOCs - Self-paced online learning with videos, guidance materials, tools, and assessments

- In-person lectures at the university
- Hybrid: lectures and online materials

The top one option was the practical training with hands-on sessions with a total of 74% respondents choosing this option. The two most preferred options were thematic workshops with 53% and o-creation workshops with 55%.

Webinars or MOOCs fully digital options have been the least preferred options with 27% and 23% respectfully.

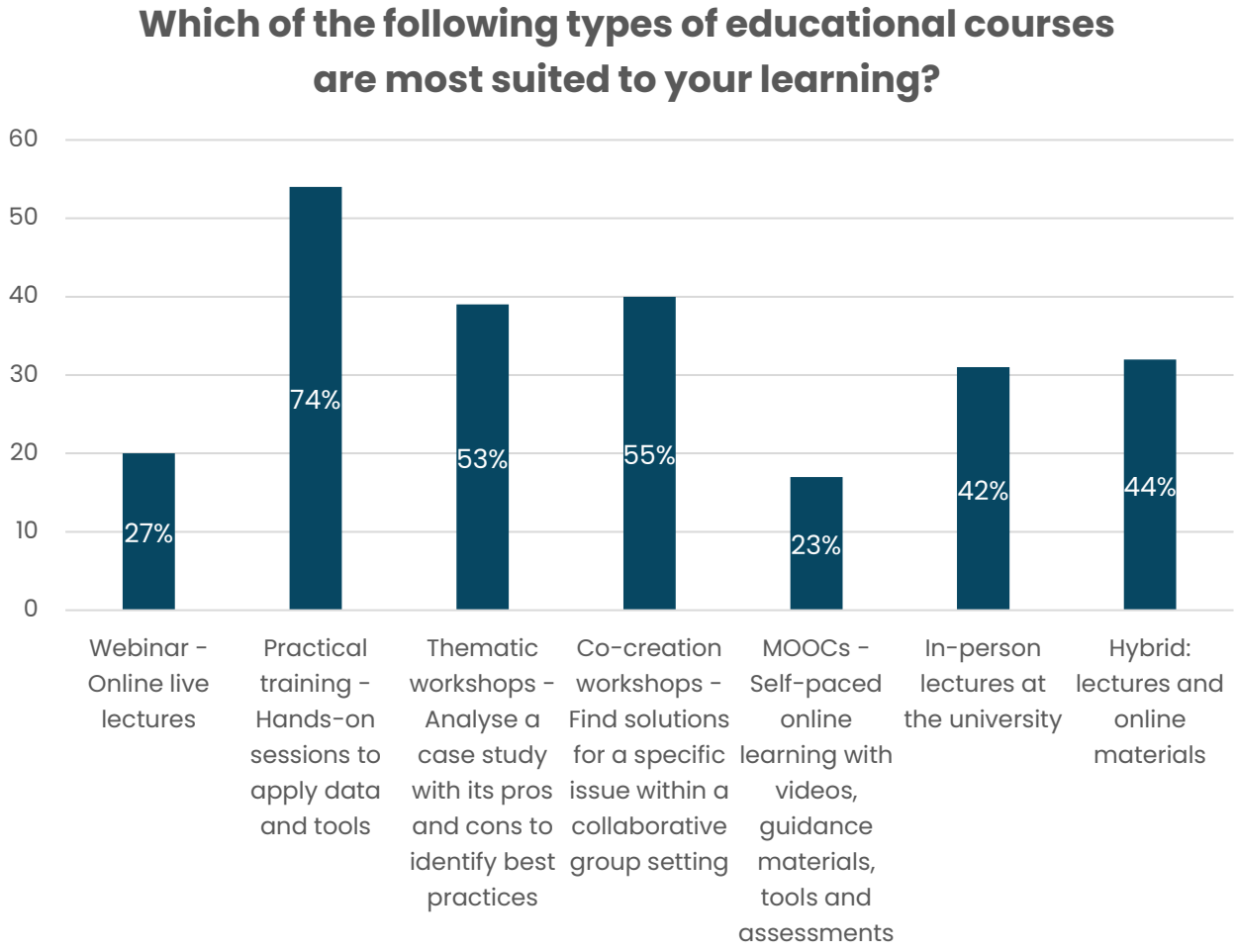


Figure 8: Preferred form of training by respondents

From the open-ended questions, several respondents show preference for a mix of self-paced (online) and practical (physical) learning, combining working in groups and in-person interactions and case studies seemed to be the most appreciated option. While others expressed the positive aspects of online resources as they "can prevent misunderstandings in listening and increase participation in class" or "it seems interesting to link them to specific tasks and use cases". While some argue that virtual/online "allow higher concentration" others prefer in person training "leaving online videos to review or further research".
Qualitative research results reinforced results from the survey, as workshops seemed very much appreciated: "both thematic workshops and co-creation workshops appear to be essential to transition

the newly acquired knowledge into a practical stage and in-depth learning process" but also case studies because the allow "to introduce real life settings which is also greatly appreciated"

Other inputs that were found interesting for the study were:

- **Comprehensive view**: the need of a holistic approach has been stated multiple times, including also building materials.
- **Job opportunities**: to present the different job opportunities linked to the course with clear use cases has also been identified as beneficial.
- **Competitions**: final gaming exercises to complete the learning experience
- **General:** Flexibility is much appreciated

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6 Conclusions

The mix of qualitative and quantitative methods, including an online survey, interviews and focus groups, carried out in the first months of the nZEBRA project have produced a set of guidelines for the creation of the content of the course. This field research consisted of the first step of the co-creation process with university staff and students. Different activities will be organized to co-create and/or test the course and integrate the feedback before the end of the project.

A global overview of the results indicates that the course should be multidisciplinary offering a wide and holistic view of climate neutral buildings. Generally, all the options presented in each question were considered important by respondents with mean and medians higher than half of the points.

In short, the summary of the main recommendations for the course creation:

	Thematic areas	**Technologies**	**RES technologies**	**In-person vs virtual training**	**Typology of activities**
Top priority	- Electricity and energy - Environmental studies - Digital tools	- Smart grids and demand side management - District heating - Thermal storage	- Solar - Wind - Biomass	- In-person training	- Hands-on sessions - Thematic workshops - Co-creation workshops
Also important	- Project management	- Batteries - Building façades	- Biofuels - Biogas	- virtual materials allowing flexibility	- videos and online activities - competitions - job opportunities description

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Annex 1

Online Survey

nZEBRA Needs Assessment Survey

The project: The nZebra project aims to develop an educational course focused on Climate Neutral Buildings, and equip current and future professionals in architecture, civil engineering, and energy engineering with the skills needed to implement these sustainable building solutions.
The survey: We collect information about the current needs and priorities of students and stakeholders in the construction sector to develop the international nZEB course. The data, collected through your participation, will contribute to tailoring the educational materials to the needs of learners. With your express consent, the data will be processed for the purpose of statistical analysis for the course development.

PROFILE

1) Please enter your email address
2) In which country are you living
3) Please select your field of study or professional background:
    a. STEM
    b. Social science and humanities
    c. Other
4) Please select your current occupation:
    a. Student
    b. Professor or university staff
    c. Professional in STEM
    d. Professional in social science
    e. Researcher
    f. PhD Student

CONTENT

5) How much should the nZEB course cover the following fields? consider 0=not covered at all and 100=main topic of the course (unit=10)
    a. Financing options and business models. Planning, directing, organising, and controlling financial activities and business models linked to nZEB.
    b. Digital tools. Simulation tools and application development and analysis. BIM and others
    c. Environmental studies. Adaptation and mitigation strategies. Calculate risks and impact of climate change. CO2 emissions. Natural environment, wildlife, and biodiversity. LCA and LCC
    d. Social sciences. The study of human beings and the way they behave in groups and in relation to society
    e. Project management. Planning, managing operational activities in the construction of nZEB buildings
    f. Electronics and automation. all aspects related to sensors and monitoring of electronic equipment, machinery, and systems, including communication devices

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g. Electricity and energy. Energy and electricity generation, different energy sources focused on micro generation in the nZEB building. Design, maintain and operate different sources
h. Eco-design, circular economy, material sourcing & supply chains. The study of the manufacturing of products in glass, paper, plastic, wood or other materials like stone, clay, artificial materials etc.
i. Architecture and urban planning. The study of the art, science, and techniques of building design, encompassing the use and aesthetic considerations, including its integration with the urban context
j. Building and structural design. the science of conceiving new building design respecting national and EU structural building codes.

6) Which level of knowledge should learners have gained at the end of the nZEB course, about the following technologies? (here there is a focus on specific technologies) 1=basic knowledge 7=expert level

a. Heat pumps
b. Green roofs / walls
c. Special glazing
d. Building façades
e. Organic ranking cycle
f. Thermal storage
g. Batteries
h. District heating
i. Smart grids and demand side management

7) Which level of knowledge should learners have gained at the end of the nZEB course, about the following renewable energies or fuels? (here there is a focus on specific RES technologies) 1=basic knowledge 7=expert level
a. Wind
b. Solar
c. Hydrogen
d. Biomass
e. Biogas
f. Syngas
g. Biofuels

FORMAT

8) What is your preferred form of training?
a. In person training
b. Virtual training
c. A mix of both
d. I do not have preferences
9) Which of the following types of educational courses are most suited to your learning?
a. Webinar - Online live lectures
b. Practical training - Hands-on sessions to apply data and tools
c. Thematic workshops - Analyse a case study with its pros and cons to identify best practices
d. Co-creation workshops - Find solutions for a specific issue within a collaborative group setting

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   e. MOOCs - Self-paced online learning with videos, guidance materials, tools, and assessments
   f. In-person lectures at the university
   g. Hybrid: lectures and online materials
10) Can you tell us a bit more about why you chose these options?
11) Can we contact you for a brief 30-minute interview to discuss your training needs further with you?
   a. Yes
   b. No
12) Is there anything else you would like to share?

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