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D 6.4 - Report on workshops and upskilling actions for testing the digital tools

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D 6.4 – Report on workshops and upskilling actions for testing the digital tools

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Publishable executive summary

This document summarises the process and upskilling actions related to the Trial testing of the digital tools, and its outputs and findings. These form a crucial part in the ARISE success, from which a significant part of the projects intended impacts can be measured.

Following the platform's development, the pre-production activities, and coordination with WP4 and WP5, the Trials testing activities were initiated, using the ARISE platform as the vessel, and the “overall upskilling action tool”, acting as the main deliverer for those actions. Trials focused on testing a sample of The Qualification Schemes to a selected number of AEC professionals.

The Trials upskilling actions further tested and validated the Qualification Framework, and its associated Unit of Learning Outcomes. It also enabled the testing of teaching materials, digital tools, and delivery methods, assessing suitability for widespread market uptake. The aim is to move the AEC Industry further towards an energy-efficient built environment, stimulating increase demand and available supply for sustainable energy skills.

While testing, ARISE aimed to increase the number of professionals upskilled in the knowledge and usage of digital tools that can help advance the Energy Efficiency cause. They also served as a basis for evaluation and future recommendations for exploitation and further market implementation, based in part on user’s feedback.

This Report also includes as appendix, the user’s feedback of the ARISE proposed Qualification Framework and methodology, related to WP6’s D6.2.

List of acronyms and abbreviations

BEM – Building Energy Modelling

BIM – Building Information Modelling

BIM-EPA – BIM Energy Performance Alliance

BMC- Belfast Metropolitan College

CEIM- Civil Engineering Institute Macedonia

CIAT- Chartered Institute of Architectural Technologists

CPD – Continuous Professional Development

D – Deliverable

EE – Energy Efficiency

EIHP- Energy Institute Hrvoje Pozar

GSL – Guided Self Learning

ICT – Information and Communication Technologies

IST-Instituto Superior Técnico

LCA- Life Cycle Assessment

MS- Milestone

NZEB – Nearly Zero Energy Building

LO- Learning Outcomes

OA- Ordem dos Arquitectos

OE- Ordem dos Engenheiros

PBL -Project-Based Learning

PRR - Plano de Recuperação e Resiliência (Recovery and Resilience Plan)

QF-Qualification Framework

RIAI-Royal institute of Architects of Ireland

St-Sub-task

T-Task

UI-user interface

ULO- Unit of Learning Outcome

WIP-work in Progress

WP-Work Package

Contents

1. Introduction

This report addresses the outputs and findings of the workshops and upskilling actions for testing the digital tools. It is linked to previous WP6 reports, and to reports from WP4 and WP5. Trial testing of the digital tools was symbiotically linked and dependent of the work carried out by those WPs and their outputs.

WP6 coordinated actions to moderate the Trials.

This report will focus on the actions of Deployment and support of Trials, the Trials reach, feedback, and output results, and the use of the Platform in testing the materials. It covers upskilling actions:

- To market stakeholder in general
- To testing to the specific sample users via and enabled by the ARISE.

It will refer to the reach, and feedback received, in addition to implementation actions.

Additionally, but linked to the above, an appendix is also added in this report, which related to actions and finding of D.6.2. At the time of its publishing, D6.2 report of feedback survey reports was deferred to this report, due some operational delay from other deliverables, and to the lack of enough public engagement, not towards the project but in effective in provision of feedback.

2. Objectives and Scope

The Upskilling action by WP6 aimed to:

- Validate the developed matrix of competences and qualifications to increase market competence, including digital tools of delivery and certification, in terms of meeting market demand and industry needs concerning transferability and recognition.
- Build the capacity of the market drivers and actors, on both demand and supply side, to appreciate the benefits of the developed digitalisation skills and certification program, and to apply them in mutual collaboration.

- Develop and use pilot samples of the matrix of competencies, learning outcomes, and training models and tools.

The Trials were directly linked with task 6.5 of WP6: Deployment of Trials /test and delivery of a digital training tools and pilot upskilling schemes package. They were enabled via the ARISE platform, but also via webinars, and/or direct interaction with the target audience, in either promotion and/ or participation in international and regional training events.

They involved action of dissemination, building -up and leading up the enrolment in the trials via the ARISE platform. The iterative cycle of improvement and realignment of the training methods against the tools and models, to improve the product, and to make it ready for exploitation in WP8 (directly connected to task 6.8 too) are also an integral part of the Trials. For further details about improvement of materials and final package, refer to other reports from WP5 and D6.5 which are interlinked.

WP6 developed samples of the matrix of competencies, learning outcomes, training models and tools, as described in previous WP6 reports, and as referred to partially in WP5 reports.

WP6 implemented testing of those samples in a wide-scale demonstration and tests across Europe mainly via the platform, along with supporting events, in person and online. The ARISE QF sample micro-learning, materials, and assessment, developed together with WP5 were deployed in the ARISE platform. We also tested the application of the ARISE method for recognition of competences in sustainable energy skills- the digital badging. The overall goals of these Trials were to confirm:

- suitability of maturity level matrix and framework content, as well as training material approach, methodology, and format;
- the benefits and impact of the application of acquired skills; and
- to obtain feedback that could form and help in recommendation to other WPs for improvement of their outputs.

3. Workshop and Upskilling Overview

3.1 Barriers and challenges

WP6 moderated and lead the Trial for pilot sample delivery of the Arise Training. There were some barriers and challenges faced in the ARISE Trials:

The recruitment of at least 300 professionals for the Platform Trails stage was a challenge. Despite high numbers of engagement and participation in ARISE project with general dissemination and upskilling action, the pre-registration and then registration in Platform had a slow build up.

Ensuring active collaboration and dissemination from organisations and professional bodies during inception and conceptual stage of the project was a difficult, both leading up to and during initial phase of the Trials.

Survey fatigue was another barrier to overcome in ultimately obtaining the feedback validation from the market. Methodologies to mitigate this were referred in WP6 reports, D6.1 and D6.2, with further information in the Appendix 1 of this report.

Aiming for an equal spread across regions was a challenge depended on different contextual and market conditions for each country, along with different rates of uptake and enrolment.

A potential resistance and fatigue towards online learning was another factor to consider. The dynamic of the ARISE platform, with gamification and the micro modular approach, provided features seeking to mitigate this risk.

During Project lifetime, pre-production and production time of material was an originally underestimated challenge. Production, moderation, verification, testing and amendment of e-learning, as well as support for e-learners was more time consuming than estimated during ARISE inception.

3.2 Upskilling Actions

3.2.1 General Overview

General upskilling of the overall AEC public was achieved as the result of joint actions with WP8 and other partners/WP. ARISE participated and attended conferences and AEC events, published articles, and delivered webinars and online workshops to reach target AEC audience for awareness upskilling. Participant's engagement and interaction with ARISE has been recorded via social media posts, website interaction, forum participation, and newsletter subscription, which provide further opportunities for upskilling. Through all these, ARISE increased awareness of the benefits of digital tools towards sustainable and energy efficient building. This supported the need and benefits, as well as delivering an increase in demand of such skills in both the supply and demand side.

The ARISE goal was to gather at least 1000 participant via these actions. We exceeded that number by the end of the project; refer to WP8 dissemination reporting figures for further details.

From that overall participation and engagement in ARISE, WP6 was to secure at least 300 professionals to partake in effective upskilling training, to test a sample of material and the tools created by WP5 and WP6, aligned with the ARISE QF developed by WP3. The trial deployment and delivery of testing for those 300, passed through the ARISE platform.

3.2.2 General upskilling Actions

3.2.2.1 A multi format Approach

Prior to the ARISE platform deployment and launch of Trials materials, consortium partners had engaged with their local connections, and/or participated in events presenting ARISE in regional and international events, meetings, etc. Consortium members authored and published ARISE related articles. WP6 coordinated and collaborated with WP8 in disseminating actions of general upskilling and/or to attract and increase users to the ARISE trials. In events, articles published, website,

social media, the benefits and usage of digital tools was embedded and communicated to the AEC audience. For purposes of WP6, these constituted earlier upskilling actions of awareness, and preparation of market stakeholders, on both the side of the supply and demand. ARISE social media accounts and newsletter were also used by WP8 to help WP6 reach the audience.

ARISE had representatives in conferences and events. There was coordination with WP6 to include in communications on such events calls for action in recruitment to Trials actions and requests for feedback. Example of events include participation in the CITA Gathering conference, (Annual BIM Coordinator's Conference in Dublin and online) and other similar Industry Events. Please refer to WP8 Dissemination Reports for full details and information regarding events. Consortium members engaged in networking in their regions to promote ARISE and incentivise engagement, feedback and ultimately participation in the Trails.

The reach of participants in the project via WP8 dissemination had a steady and positive increase from start of ARISE project (please refer to WP8 reports).

ARISE aimed to reach by direct delivery and upskilling action 1000 construction sector professionals. This delivery and upskilling were proposed to be achieved through project communication, dissemination, and program development. These participants could engage either with the website, social media, subscriptions, and/or via digital platform. This participation by AEC stakeholders was being achieved organically by public's engagement and interest on ARISE demonstrated via the website, social media traffic and newsletter subscription for example. As well as attendees in events exposed to ARISE speakers. General upskilling actions in awareness and benefits by those means were keeping on track since early Project and by the end of the project, we exceed this number.

However, this positive achievement, did not organically translate as initially thought into the similar numbers to feedback appeal responses, or pre-registrations into (platform) trials. The individual partner networking in local regions was raising awareness of ARISE, but not resulting into direct engagement in registration by the Market. Direct contacts and engagement made by ARISE with professional bodies took a bit longer to develop into direct consequential actions and participation into the Platform uptake.

ARISE, additionally to participating in established Events and Conferences, and to the successful WP8 dissemination mediums that were delivering positive public general engagement with the project, organise some online events too.

3.2.2.2 Workshops

ARISE organised blended or online workshops, working in conjunction with larger organisations/events that already had a widespread reach into Industry stakeholders and target Audience, to maximise potential of higher number participation, and make events more successful in terms of impacts and recruitment for Trials.

Brussels- A live/online workshop was held in Brussels in 2023, and two online workshops were organised, in conjunction and hosted by BUILDUP., aimed for both trainees and trainers respectively held in January 2024 and February (2024).

WP8 was able to for secure and organise for WP6 a live event, with online broadcast, in the Auditoire V.Bourgeois –ULB Campus Flagey, in March 2023. ARISE held the "*Learning bites on green and digital skills for the built environment*" workshop. The ARISE project was presented, as well as the QF and the upcoming platform and trials. The aim had been to recruit participants for feedback and platform Trials by bringing them onboard and along the process. Unfortunately, despite the efforts and organising the event, effective attendance numbers were low. A SLIDO survey was incorporated some of the main QF and learning methods survey questions embedded into the workshop presentation. The findings were again positive and supportive relating to the QF and overall ARISE approach, even if limited. See more detail information related to this in the Appendix 01

BUILDUP- Two online workshops were organised, and hosted by BUILDUP, for trainees and trainers. They were designed to: act as short upskilling actions on digital tools and EE awareness, and in the importance of skills demand and increase in the industry; present ARISE Platform and associated Trial programme; recruit participants for (platform) Trials and to the Skills Gap survey (mostly for trainees). We also directed participants to further contribute to our QF validation survey (mostly for trainers). During Workshops, direct links, and instructions on how to access the ARISE platform and Trials was supplied to participants, as well

as link to the Skills Gap and QF feedback surveys. Effective recruitment numbers generated from these events were not in the region anticipated.

3.2.2.3 OA's piloting

Regional networks weren't having enough effect in recruiting for Platform Trials or Skills Gap and QF feedback surveys . Efforts in organising ARISE events had also not generated a significant number of participants, as well as contacts with organisations and professional bodies, and other entities within the AEC sector. This was despite the general engagement numbers with ARISE that were building steadily, in relation to general upskilling action. We weren't obtaining a desired "trickledown effect" towards participants taking action in feedbacks and registration in platform training.

Identifying were there might have a higher demand for the ARISE training, and more direct route to market was key for WP6 to assure a faster uptake for the Platform, and that's were efforts were concentrated. The intention was to secure a collaboration, and work on a pilot testing example in a region. Then, when successful, use it as a springboard example to incentivise and attract other regions and organisations to participate in the trials. Due to BIM mandates coming into force, with the help of WP8, we focused on Portugal. WP6 are aware that BIM mandates in the UK had driven professionals to embark on an upskilling route in BIM prior to 2016 introduction. We anticipated similar opportunity could be found in Portugal, with government BIM mandates and regulatory changes imminent. Also, on behalf of WP6, WP8 had contacted professional bodies across Europe to collaborate directly with ARISE. We had obtained the most direct response from the OA in Portugal.

We arranged an upskilling and recruiting online event with the OA (Portugal) In July 2023, delivering as part of their ongoing CPD series called "Technical Tuesdays" (Terças Técnicas). These focused on themes such as climate change, the AECs carbon emissions contribution and on the energy efficiency and digital tools /skills that can be enablers towards achieving EE.

Fig.1 OA Event Presentation sampling

Despite a high registration number and expected attendance, there were 7 attendees. Due to the number of attendees, a follow-up session was agreed and booked with the OA for September/ October 2023, to increase further the numbers. The new date was dependent of OA's scheduling but would also have allowed for extended time for advertising aimed to secure a bigger audience. Due to changes in OA organisation, that new session was cancelled.

3.2.2.4 Working towards a wide scale Trial dissemination

An even more direct collaboration with OA's new team was initiated. After a series of presentations of ARISE, the QF and the platform it was agreed to launch an ARISE Test Pilot programme in Portugal with OA dissemination and support. In

February 2024 a large-scale Platform Trial was initiated, with more than 2700 users, members of the OA enrolling in the ARISE platform.

From that example, other professional bodies and organisation were more easily persuaded to follow suit, for example RIAI, OE, CITB NI, and EIHP. These organisations provided their support and dissemination actions towards the ARISE Trials. This allowed ARISE to steady build effective participants numbers in the platform Trails.

3.2.3 Platform Trials

3.2.3.1 Recruiting and inception training actions

These were aimed to include at least 300 users, and to be carried out via the deployment of the ARISE platform, and to linked activities and supporting actions of dissemination in conjunction with WP8 and / or assisted by the other WPs.

It also integrated the coordination and collaboration with WP5 in the creation and validation of Training materials and tools.

The Arise Platform was deployed in wide scale material Trials with some delay, as result of previous delays with the development of WP3 deliverables, development, and production of some platform recognition features by WP4 (CERTcoin initial concepts), and also the time required for production of materials, which was underestimated in the initial planning assessment.

As referred, there was an early positive buildup in numbers in terms of direct engagement, interest and reach of ARISE in dissemination actions related to interaction with social media and website and newsletter. However, these had a very slow translation towards actionable response from those participants, for example in feedback requests, and early registration of interest for the platform trials or then enrolment on platform. Achieved outputs regarding Platform trial recruitment indicators were low through a long period of the project.

WP6 faced an initially low and slow buildup of users related specifically to the platform usage. Efforts put into more direct events, had for a while not resulted in

numbers. By the end of 2023, 100 users had eventually enrolled in the platform. An extension of the ARISE project was requested to allow for compensating the initial slow update, to secure further users, and to enable them time to complete training an increase impact. Actions were taken to mitigate those issues.

BMC regionally, initiated upskilling actions with a selection of profession cohorts in the UK, which we could directly reach, even before platform launch. These were intended to assist pre-production of trials materials, prior to Platform launch. It was hoped that participants could at later stage, having been involved with ARISE, enrol on the platform and "collect" their recognition for learning and further advance their training. It was also intended that his would provide early feedback and testing of pre-production of trials materials. It was initiated towards the end of 2022, and continued through 2023, and extended to 2024. It involved a contact with an average of 45 participants, mainly from a designer background (architecture, engineering, fit out supplier or designer). Not all continued the engagement, and there was evidence of the expected rate of attrition and drop in retention in online training (based on BMC experience of similar online delivery and courses). These actions covered the testing of BIM BASICS, BIM APPLICATION, BIM SUPPORT materials as well as BIM modelling. These areas had been identified in the Skills gap survey. The BIM Modelling was sought out by these participants and was a subject that required a blended approach. WP6 tested how to improve delivery or assessment to possibly make it less depended in bended delivery and evaluation and promote a less time-consuming training for users.

Providing practical exercises and supported blended virtual classed with access to follow up videos, helped students' progress. It indicated that users still required a large amount of in-session, one-to-one blended support with tutor to help learners achieve progression. This was particularly relevant for practical tasks, and/or analytical tasks that could be theoretical in natural but considered higher in a EQF level rating. However these actions also identify that certain aspects of training could be subdivided into micro sized modules or "bite size" sessions. It also enabled WP6 to assess what could be taught, and assessed, with limited tutor dependency, with a relative high success rate. For example, the creation of the UI based modules

in ARISE trials and final package, related to the Modelling. Energy Digital tools were also embedded in the training.

These inceptions upskilling action set the stage for WP6 and WP5 material pre-production, production, and pre-testing prior to Platform deployment. And were meant to start to help engaged a with regional audience and build numbers.

They also enabled testing of the model of delivery, in terms of feasibility for larger scale deployment with Platform Trials, especially in terms of assessment and validation of achievement. It verified that for practical subjects and complex ULOs/Tasks, the validation of assessment was time consuming, for both users and tutor. Several iterations of feedback and improvements were required to achieve the skill outcome. However, this is dependent on the level of maturity for example at a higher level such as EQF level 4 and above. If skills maturity level / EQF level equivalence expectancy was to be lower, then possibly it could streamlined. These upskilling actions also took into consideration a comparison/mapping with UK qualification Framework, specially accredited courses validated by the OCN NI awarding body, related to BIM Training, developed as part of previous project. WP6 experimented on how try and align delivery of ARISE QF with some the OCN QF Learning outcomes. This tested flexibility of ARISE QF to map and be allow recognition across other National/ Regional Qualification Frameworks/ Schemes.

At least 25 participants from these early cohorts that we targeted a direct upskilling action in the form of blended classes have since then enrolled officially in the Platform to have training recognised, or to proceed further.

3.2.3.2 Further sessions- Induction and Virtual classes

Presentation induction sessions with selected cohorts in the UK were held by WP6 (BMC), during late 2023 and during 2024. These were intended to present the platform, assist in enrolment and navigation, and to request feedback. Example cohorts included Construction Management, Civil Engineering and Quantity Surveying Apprenticeships.

In Portugal, to ensure a smooth and assisted start of the trials for the OA participants, three inductions session were booked and delivered virtually by WP6 via MS Teams.

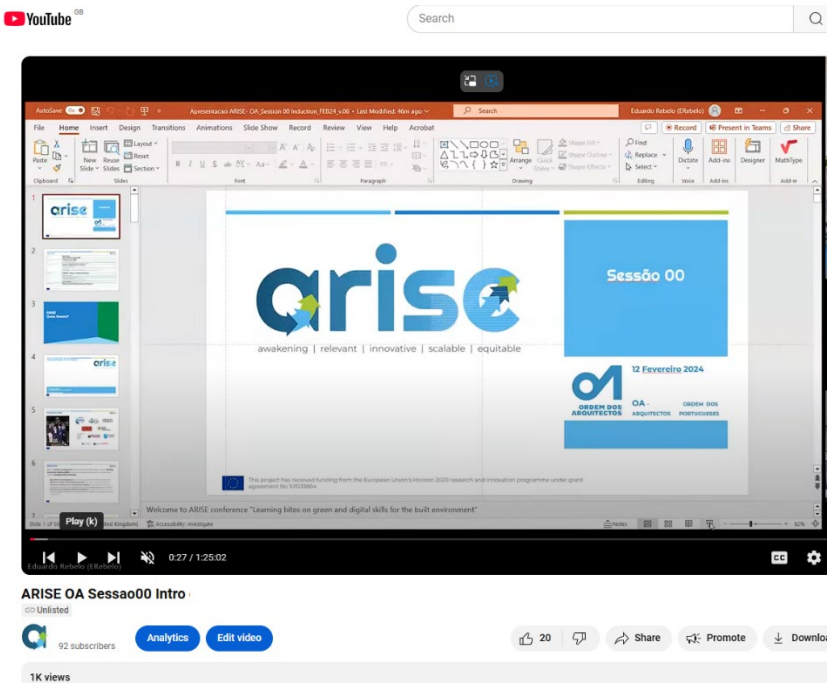


Fig.3 Session recording available online

ARISE was explained to potential participants, including benefits and methodology, as well as aiding with enrolment and navigation of modules. Sessions were recorded and made available afterwards to support those who had registered but could not attend. For the first session alone we had more than 1000 views, with a further 400 plus with the other two recordings.

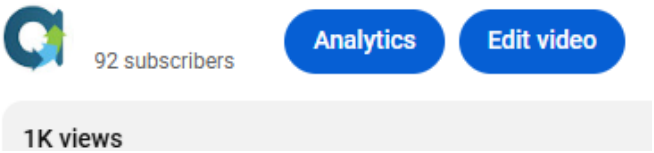


Fig.4 viewing stats record

From these sessions, and to streamline process for future new participants, four specific short summary videos were produced and circulated to participants, which again had very high number of views:

- ARISE ENROLMENT- Create account. 1200 views

- ARISE ENROLMENT- Navigating and access training 930 views
- ARISE Enrolments –First modules and advised Pathways 639 views
- ARISE ENROLMENT- Support contact 329 view

This demonstrates how much support and guidance participants desire, and may require, when accessing and commencing e-learning training. An equivalent English based version of these short summary induction instruction videos was produced and posted online. The links for both English and Portuguese versions were embedded in communication templates, used in further disseminating and communicating with entities, professionals, and companies by WP6, when promoting and inviting users to participate in the Trials. The objective was to reduce attrition, to help with initial process for participants to get their accounts validated, and in navigation the training. It was hoped that this would reduce possible barriers to participation following initial interest and invitation to participate. Templates and links were shared with Consortium members, so they could use them if required, when they were able to establish contacts to potentially interested parties.

Another induction session was scheduled prior to Portuguese users commencing the BIM Application and modelling modules on the platform. This attracted 327 participants either attending at the scheduled time or viewing the recordings. Following request from 40 users and additional follow up session was provided online for further clarification. After the introduction sessions, WP6 followed up with a similar format as the virtual up skilling actions that BMC used with the UK sampled cohorts. These were booked and delivered, to address practical project-based training, further assisting participants in the training and queries from past modules. A pre-condition on completion of certain software UI modules, among others was indicated, to facilitate delivery and skills progression, but also to stimulate overall uptake and completion rates of the ARISE training. Some upskilling sessions were held after August 2024, as WP6 was conscious that between June and August was a holiday period for those users, so to increase possible impact and reach, we tried to avoid delivering during that period. Sessions were recorded and then included within a module. However, one of the objectives

was for users to avail of a direct blended delivery test sample, and of the opportunity to interact in real time with a tutor and with their peers.

During the course of the project and particularly the Trials, WP6 worked with WP8 to support dissemination and contacts with public and cross regional entities. This included focused and direct contact with, but not exclusively:

- 11 of ARISE associated partners.
- 12 Professional bodies and/or professional association, across Ireland, UK, and Portugal
- At least 84 architectural and design practices, ranging from SMEs to larger companies, in Portugal, UK, Spain, etc.
- At least 3 public Authorities associated with public procurement and contracts.
- At least 2 association of Contractors and manufacturers, as well as contractors and manufacturers directly
- 16 potential investors to participate and showcase with in ARISE.

Invitation and dissemination Templates documents for contact related to Trials were produced and circulated for partners to use. WP6 also used the platform to advertise and attract participants for WP7 international workshop and ARISE closing conference.

As a result of the Portuguese pilot Training scheme, there was a recognition and request for training in Portuguese. Whilst this added a previously unaccounted additional effort in the material production, it was beneficial in engaging participation from this region. A similar limited request was facilitated for some modules in Italian, as the language preference was also identified by regional consortium member IBIMI.

3.2.3.3 Overall Reach and impact

Despite the initial slow uptake, following the continued dissemination actions with WP8 and consortium partners, and bolstered by the increases obtained by direct collaboration with the OA in Portugal, we observed a steady increase in numbers during the Trials. As a result ARISE has connected with and impacted a large

number of participants, exceeding the initial targets. The pilot trail of qualification samples attracted 3361 users to the platform during the ARISE lifetime for participation in the trials. The majority was achieved after Trial launch, specially from February 2204 onwards (around 3200). From these users 2813 enrolled in micro-modules, with 2395 confirmed to have accessed modules. This demonstrates engagement and participation with the upskilling materials with stakeholders in the AEC Industry. The spread of those users per region is uneven but reflects in part current the effect of certain legislative actions and other regional conditions.

As previously mentioned in Portugal towards the timing of the Trial launch new legislation and BIM mandates were coming into effect. This resulted in a desire from stakeholders to seek training, actively engaging with OA to assess their options. There was also the change in the OA administration, with a new executive team dedicated and driven to provide upskilling opportunities to support their members. ARISE capitalised on the combination of those two favourable conditions in the Portuguese context. Working with WP8, WP6 was able to reach the new OA team directly, with support and dissemination by the OA resulting in a surge in users. This was then used as an example of collaboration with OA to showcase to other professional body, in other regions and professionals, how ARISE Trails could benefit their members. With BMC leading WP6, there was also a more direct and facilitated route, in terms of logistics, to engage with groups of cohorts in the UK, to deliver specific upskilling actions, using BMC network directly. UK and Portugal became the two main case studies of pilot training in large numbers for ARISE.

With the coordinated efforts of dissemination with WP8, and assistance from regional consortium members, WP6 engaged with users from other consortium regions as follows:

Figures per region, enrolled in trials via platform, from the overall 3361:	
Belgium	3 users
Denmark	18 users
Ireland	79 users
Italy	67 users
Netherlands	5 users
Macedonia	38 users
Portugal	2743 users
UK	282 users
countries outside consortium regions	126 users

Table 1. ARISE Trials -Participants by region

More than 1000 participates reached.

ARISE aim was to reach by direct delivery and upskilling action 1000 construction sector professionals. This delivery and upskilling were to be achieved through project communication, dissemination, and program development, measured by participants engaged either with the website (social media) and/or digital platform. General dissemination activities by WP8, via website, newsletters, social media, forum, and published articles, which acted as upskilling materials, secured that goal. Specific upskilling in the format of workshops and events, associated with WP6 Trials, contributed further to that achievement.

During public events, while promoting ARISE training, key elements of the upskilling contained in presentations addressing the market, was the importance and benefits of sustainable energy, along with the enabling digital skills. The Trials were able to build even further on that number, gathering more than 3000 active participants that enrolled in the platform. ARISE and WP6, with collaboration with WP8 and other WPs, was able secure this goal via more than one of the measurable indicators.

More than 300 participating in direct platform trial material sampling test

It was also intended that from the 1000 participants in generic activities, 300 would take part in specific upskilling via the platform and qualification modules. This was achieved with 2395 professionals accessing test sample modules. Of this number at least 415 confirmed participants successfully completed training modules.

Arise also sought to involve at least 20 SMEs and 10 administration Authorities from partner countries, engaged in a demonstration of the benefits of investments in sustainable energy. With more than 300 users on the platform indicating they work for SMEs in their regions, data gathered at time of enrolment on the platform confirms this engagement was achieved. There were also participants that worked in Public Authorities, such as for example:

- Instituto da Habitação e da Reabilitação Urbana, I.P.
- Secretaria Regional dos equipamentos e Infraestruturas - Madeira
- Direção Regional do Equipamento Social- Divisão de Projeto"
- Secretary of State for Housing (Ministério das Infraestruturas e da Habitação)
- Câmara Municipal (City Council) de Lamego
- Câmara municipal (City Council) de Lisboa
- Câmara Municipal (City Council) de Lamego
- Câmara Municipal (City Council) de Mafra
- Câmara Municipal (City Council) da Maia
- Câmara Municipal (City Council) de Mértola

4. Key Findings and Outputs

4.1 Skill enhancement

WP6, working in conjunction with WP4 and WP5, developed and delivered pilot training, which including suitable materials and tools, based on the qualifications designed by WP3, via the ARISE Platform. ARISE reached by direct delivery and upskilling action more than 1000 construction sector professionals via website, newsletters, social media, forum, and published articles which acted as upskilling materials. Including platform engagement, we reached more than 3000 participants.

During public events, while promoting ARISE training, key elements of the upskilling contained in presentations addressing the market, was the importance and benefits of sustainable energy, along with the enabling digital skills. From more than 1000 participants in generic activities, more than 300 took part in

specific upskilling via the platform and qualification modules. In fact, more than 3000 (almost 4000) were enrolled in the platform

In the Platform, at least 40 micro- modules were made available during project lifetime (final package of material). A pilot testing sample of materials connected to the QF, promoted upskilling, to achieve proposed objectives and driving impacts.

The trials piloted The BIM Basics Specialism Pathway, which included specific modules covering for example: BIM methodology, benefits in general as well as specifically for EE, EE BIM tools, Terminology, supported by case studies and the importance for EE in several other modules.

The training was selected based in the skills gap surveys, ensuring that the samples were covering several aspects of the ARISE QF, while at the same time addressing needs and being impactful in the increase of market capacity. An indicator of success is the interest in uptake with 2395 enrolling and accessing sample modules, with at least 415 successfully completing training to date. SMEs and Public Administration Authorities workers took part of the trials, showcasing the range of the interest too.

The initial concept proposed in the ARISE anticipated that “a module would address at least 5 specific competencies, with each competence being awarded at least “5 CERTcoins “ and it was estimated for conceptual purposes and to set a goals that with 300 learners, each doing 5 modules or competencies with 5 CERTcoins each, it would possible to achieve 7500 CERTcoins.

With the development of the project, including the definitions of the QF, associated Ulos, and competencies, supported by findings from the WP6 pre-production in developing the trials, this concept changed. As we sought to along the QF with delivery into effective micro-module format, the concepts and scale of modules had to change. Further details on the final adopted approach/ method can be found in D6.5 Report. Alongside this the concept of the “Certcoin” was replaced by the micro badging. Further details on this change can found in WP4 Reports, including D4.7 and D4.8 Reports.

"CERTcoin" was the initial proposed conceptual naming for the digital badging that would record achievement and progressing of learners through the micro modules, and or milestone achievements. It would have been issued to learners to signal completion of a module and achievement of a skill/ competence/ task, etc... Storage was intended to be done in a blockchain ledger and it would have features to ensure fidelity and cross platform transferability /verification. This also with in mind the purpose to make the user earn CERTcoins that could be exchanged after reaching a certain threshold for a formal certificate.

After investigation on existing IT technical solutions that could deliver the "CERTcoin" intended objectives and features, it became clear that they all use a form of Open Badges linked to an existing coin system such as Bitcoin or Ethereum. It also became clear that most of these where in the state of proven concepts. Without scaling them up. At the same time, it became clear that Open Badge was working on the release of Open Badges 3.0 standard. In this standard the big leap made was including blockchain based technology on Verifiable Credentials. This made the need of working with existing coin systems obsolete. While at the same time hugely improved secure linkage of a badge to a verifiable issuer and a verifiable receiver. This investigation carefully documented in the first WP4 deliverables.

More specifically, the ARISE team decided to choose for an existing Open Badge service provider Open Badge Factory. As that service also allowed us to create modular learning pathways in which a learner has to earn a certain number of Open Badges on a learning pathway & after completion of that pathway automated issuing of the final Certificate in the form of an additional Open Badge. The original concept of it rewarding achievements is maintained, while the issuing of the Badges is fully integrated into the ARISE platform is followed. This with integration of earning Experience Point as additional gamified feature. How it was implemented in the ARISE platform is documented in the final WP4 deliverables.

Despite those changes, WP6 was still able to secure an impactful achievement in upskilling from the large number of participants engaging with the platform modules and trials. The micromodules still addressed Competencies/ ULOs skill's knowledge, with a Digital Micro Badge awarded upon completion. WP6 trials upskilling actions resulted in 3246 confirmed Individual module digital badges achieved. Furthermore 329 Milestone Badges (associates for training plans) were achieved, confirming achievement on specific Pathways route towards Framework based Specialisms. These can be considered "certificate" achievements.

4.1.2. Application and Impact

An initial assessment was conducting via profiling of participants in the surveys regarding QF feedback. This profiling indicated reach of users that were involved or would be involved in EE projects, including NZEb, as well as an estimate of projects sizes in m^2.

4.1.3 Post Training Survey

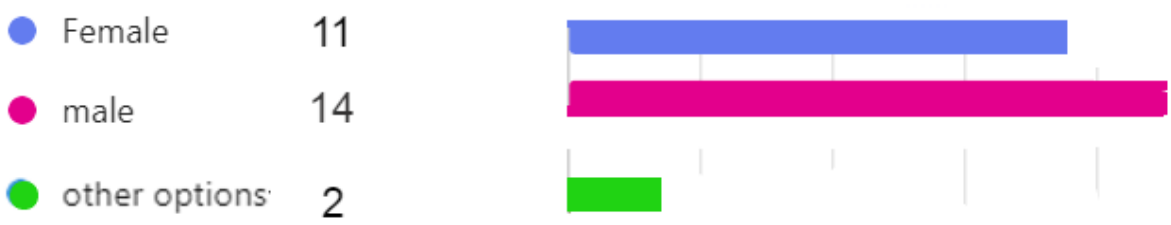
An additional, directed, and focused Post Training survey was conducted, to further confirm those figures.

We had a total of 27 voluntary responses by project end date. We expect that the number of responses will increase further and will keep monitoring.

4.1.3.1 User's profile:

Gender

- Male 14
- Female 11
- Other 2



Nationality & Residence Region

Mainly Portuguese participant replied so far.

Nationality		Regions	
Portuguese	22	Portugal	23
British	2	UK	2
Polish	1	Portugal	1
Spanish	1	Ireland	1
Indian	1		

Table 2. Survey responders Profiling by region and Nationality

Education Level

The majority had a higher education level (Degree/ Master's Degree) and the audience was primarily linked to Architecture.

Original Educational Field	
Architecture	23
Mechanical Engineering	1
Architecture technologist	1
Self employed	6

Table 3. Survey responders Profiling by education

Role

Role	
Coordinator	2
Owner/ management	5
Architect	19
Consultant	1

Table 4. Survey responders Profiling by Role

Employment and Type of company

Type of Company or Employment	
SMEs	16
Contractor and Estate Investor	1
Public Authorities	4
Self employed	6

Table 5. Survey responders Profiling Employment

In the small sample of participants, it is still reflected, in some proportion, a sample of overall uptake: with architects, engineers, technicians, and managers taking part, from private SMEs and Publish Authorities.

4.1.3.2 Questions

QUESTION 1- Average number of projects involved per year?

QUESTION 2a- Average number of projects involved per year?

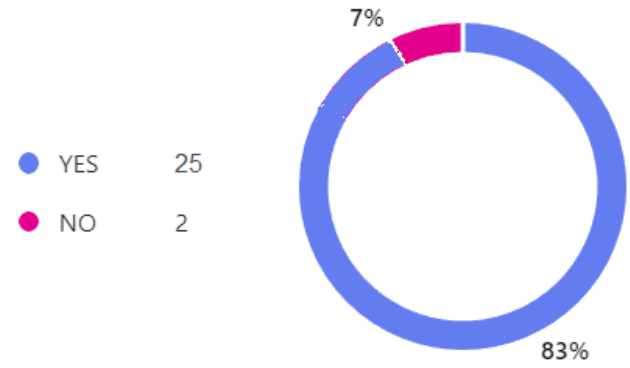
QUESTION 2b- Average size (in m²) of those projects involved per year?

Type of projects	Average of projects p/year	Size (m²)
All	12	1000
Mixed	10	200
Residential	1	20000
Mix	10	Unsure
Residencial, mix, new, refurb, etc	4	250
Hospitality, residential, office, mixed use, new, renovations	10	500
Residential and government buildings	5	5000
All Types	20	Unsure
Residential, mixed used, new, renovations, retrofit, legalizations	23	450
Renovations	Unsure	80
Renovations	Unsure	150
Public Housing	6	150
Hospitality, residential, office, mixed, , new, retrofit	10	1000

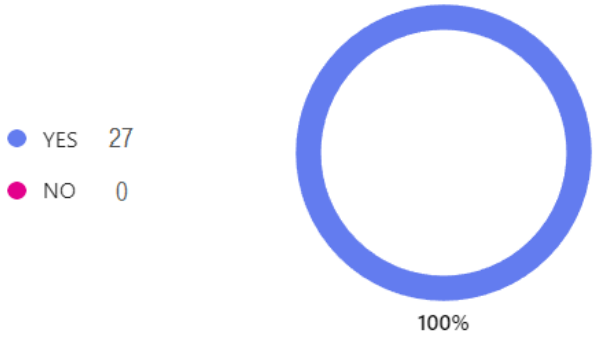
Residential and retrofit	5	400
All	20	350
Residential, mixed used, new, public buildings, public spaces, etc...	10	10000
New and renovations - water and sanitation sector	25	Unsure
Residential	6	150
All	5	Unsure
All	5	Unsure
Residential	8	1000
Residential	8	1000
All	100	300
Mixed use	10	1000
Mixed use	10	Unsure
All	15	1000+
	323 total	25980
Overall total m² per year		**8.391540**

Table 6. Survey responders Project type and quantities

QUESTION 3-After Engaging with ARISE was it clearer the advantages and importance of Energy Efficient Building and the role of upskilling (in enabling digital tools) to facilitate achieving of those target/ goals?



QUESTION 4- After engaging with ARISE upskilling actions, do you recognise the benefits of the skills proposed by the project and its overall Framework?



QUESTION 5- After engagement with ARISE will you recommend (to other fellow practitioners and workers) and/ or demand (if you are a procurer, employer, or other applicable) for other professionals to possess such skills?

QUESTION 6a v01- Have/are you/your company been involved in energy efficient projects (and in specifically applying NZEB near zero energy buildings), requirements, and the ARISE FRAMEWORK proposed skills and digital tools to assist your workflows?

QUESTION 6b v01- Do you predict that you/your company will be involved in projects applying NZEB (near zero energy buildings), requirements soon, and you will be using some of the ARISE FRAMEWORK proposed skills to assist you?

QUESTION 6 v.02 - Do you predict that you/your company will be involved in projects applying NZEB (near zero energy buildings), requirements in the near future, and you will be using some of the ARISE FRAMEWORK proposed skills to assist you?

YES	75%
NO	17%
Not sure	8%

Table 7. Survey responders NZEB & EE projects

Findings:

On survey version 01, questions 6a & 6b related to current NZEB project and impact of skills. These seem to predict an increase of at least 10% in future uptake in NZEb, with usage of ARISE skills. Currently, 50% of users indicated involvement on such projects and application of skills. WP6 updated the survey to an alternative version of question 6, to a more qualitative format. The objective was to provide further clarity and distinguish between the data of involvement in NZEB project, and the application of the ARISE skills. However, the quantitative replies were still not clear enough about the separation between the two. For future implementation further improvement on question format will be applied. We obtained the above results which are still indicatively largely positive.

4.1.3.3 Survey Overall Conclusion:

Extrapolating the figures of this sample just to the minimum of the participant that fully completed training (415), the 75% would represent 311 participants in Trials involved in EE and NZEb projects and using ARISE skills. Trainees are involved in different types of projects, and the ones that replied that are or will be involved in NZEb projects amount to an average of 8.391540m² per year.

Therefore, extrapolating an example, based on Question 6 answers: On average 50 % to 60% of participants are / will be involved in EE/ NZEB projects.

Those that indicated that would be involved, equate to an average of 210 project per year, and a total of 4.588500m². Estimating that 30% of that overall will be the EE/ NZEb projects, and that ARISE skills are influencing those 30% of projects per year, will give an average of 1.376550 m² (in this sample only).

4.2 The digital delivery format and platform

4.2.1 Delivery format- Functionality and application

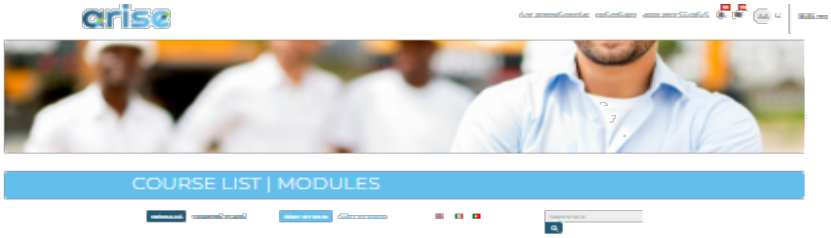
The Arise digital platform was the medium to promote and deliver the Trials upskilling actions. It provided the hosting, management, access, and deployment of the sample of digital tools for the trial and testing of the Qualification Schemes delivery material. The sample trials format was constituted by a set of Micro Modules, that were linked to the task based QF, mapping ULO's or their required competence knowledge.

4.2.1.1 Bite size Micro-modules format

Within each module a variety of training materials and assessment was provided for testing, facilitating the upskilling action, and recording recognition of achievement. These micro modules enabled the bite size delivery of training, with flexibility and transferability of knowledge across different pathways.

They were also designed and developed to facilitate mapping and recognition on CPD Schemes for the exploitation stage.

The type of learning and duration of each ARISE module is displayed on the platform, which can in turn be embedded into the Open Badges. Modules have been created to record the following information for CPD purposes:



- Name
- Description
- Criteria
- Skills & Knowledge
- Skill Maturity Level (Link to Maturity Level with ULO ID Code or expanded ULO description)
- Assessment Criteria
- Assessment Method
- Issued to / by

Fig.5 Example of some Micro-modules in platform that were part of sample testing

The transaction model to allow ARISE modules to gain CPD points was presented in D7.2 report. It is based on the allocation of time, based on the activities included in a training module (e.g. ILT, SGL, assignments, assessment, tests, etc.), by the value of 1 hour, which corresponds to the CPD equivalent of the module activity. The value of 1 CPD point is equivalent to 1 hour of active learning, in all the countries included in the D7.2 desktop survey.

WP6 reviewed and implemented the Gamification Report D7.2-*Guidelines for ARISE use to gain CPD points,* to establish an equitable methodology, with modules in the Trails assigned an indicative set time. A corelation between the XPs gamification points and time was also created, to ensure consistency and equity. This was based on 10 XPs matched 15min of training, with more details presented later in this report. Therefore, according to D7.2 transaction model 1 CPD point equates currently to 40 XPs. However, the number of XPs per CPD point can change in the future, if XP points are updated proportionally across all modules/ activities and user records. ARISE sought to make Modules flexible and expandable. The duration can increase or decrease for CPD recognition if required.

The time allocated to modules during trials has been calculated, on average, by the time required to complete essential mandatory activities, for example tutorial videos, lessons, and assessment. Each module currently has some activities considered required for learning hours and completion, and some may contain additional ones for further deepening of knowledge (optional).

If more time is required, or more CPD points for each module, extra activities can be included for a specific CPD accreditation. Additional digital recognition badges could be created, having as completion criteria the inclusion of those “extra activities. Time and XPs allocation can be updated proportionally throughout the platform. This can include an update, localised to the Digital badging information, without affecting the overall established front and dashboard time and XP allocation.

Alternatively, if a module is still deemed too short in duration to obtain a CPD point, then several related modules can be grouped, either (ideally) following QF pathway guides towards subtasks and task, or possibly to form novel combinations. Such is the advantage of bite size module approach within ARISE.

Following WP7 study of CPD guidelines, WP6 also researched and compared Trial modules with certain regional qualification courses/modules and CPDs of professional bodies. It was noted that whilst similar knowledge or subject content was considered on different courses each CPDs had slight variations on allocated active hours of learning for each criterion. WP6 sought to establish a delivery format that would be open and flexible to minor changes and adaptations, depending on which recognition Scheme ARISE may decide to be mapped against in the future. ARISE is therefore suitable for cognition in CPD schemes, without compromising the validity of current and future results of learner's achievements.

4.2.1.2 Training Plans & Pathways

A set of "training plans" categories were devised to map and divide the Framework into a deliverable format, facilitating deployment of micro modules. This in turn would map and structure progressions through pathways, enabling flexibility for adaptation and expansion of the framework to other subject and skills as it may be required.

Training Plans		
Category	**Framework "Step" Elements Scope**	**Framework Illustrative Example**
MEGA	Usually set at the Specialism level Containing a set of modules (and Macro, Meso, Micro, and Nano Training plans)	BIM Modelling, or BIM management, etc…
MACRO	Mainly set at Task level Containing a set of modules (and Meso, Micro, and Nano Training plans)	Create (aspect) building model
MESO	Mainly Sub-task base Containing a set of modules (and Micro, and Nano Training plans)	Transform (production)design into building model

MICRO	Set mainly at complex ULO/ competence/ specific knowledge. Containing a set of modules (and Nano Training plans)	Proposing (basic solution) a BIM implementation strategy	Required broad knowledge that bridge and is common to several Specialism, therefore covered in more than one micro module, eg: BIM Requirements. BIM Requirements – CDE. BIM Requirement- Software & Hardware	
NANO	Possible agglomeration or variation of different modules to incentive progression or to signal a step change in indicative EQF level/ level of complexity. Allows a better mapping with external qualification. Containing a set of modules	BIM requirements EIR I module - would be aimed at EQF level 2 (understand)	Adding: A BIM requirement EIR II module - would be aimed at EQF level 3 (explain)	Adding: A BIM requirement EIR III module - would be aimed at higher lever 4 (Devise/ Demonstrate/ Apply)
Within and forming the several Trainings Plans we have the MICRO -MODULES				

Table 8. concept of level category of training plans

The creation of micro-modules and of Training plans, that can represent pathways based on the proposed QF were tested.

QF Macro training plans, with placeholder indicating further subdivision are currently displaying in the Platform, acting as a visual guidance to users, marketed to stakeholders' enthusiasts, and possible future trainers. They indicate a way to implement the task-based Framework into a set of upskilling "components". These can be further broken down into more granular size training (Meso, Micro, nano training plans or individual modules). At end of project, we felt that further subdivision showcasing in front end could confuse users. Training Plan division are set at the Framework's Task level benchmark. Further information about QF can be found in the Trainees module.

4.2.2 Platform Functionality and application

The platform developed by WP4 catered from the subdivision of the QF into the micro-modules and possibility of different scale training plans. It also enabled a series of different material formats, for example books, presentation, lessons, direct links, videos, as well as assessment formats. Administrators could also track users, enrolments, and profile details. The inclusion of the gamification engine that rewards progression, with XPs stars and badges was a key feature. All these features were tested during trails, to pilot future wide scale implementation.

The Gamification XPs and stars were tested during Trails. On reviewing of the Gamification report, these were adjusted to a slightly different scale and number, to help them relate to time of training. This was done to provide firstly a way to attribute XPs with equity and fairness across modules. Secondly as mentioned before it facilitates the mapping with CPDs and other qualifications, that use a time-based credit system matching a certain amount of time of active learning hours with credit points. For trials we set 10 XPs matching for each 15min of training, so each 1 CPD point equals 40 XP points. Number of XPs per CPD point can change in the future, but XPs would have to be updated proportionally across modules/ activities and users' dashboards. During Trials these were one of the implemented improvements done to platform suggested by WP6, to allow and facilitate this update of XPs across modules and users if required.

The recognition of the qualification was also developed to be integrated with the platform by WP4, via the issuing of the Open badges with and LTI tool. The communication of the LTI tool to Open badge factory was tested during initial phase of the Platform Trial deployment to ensure its functionality.

ARISE and WP6 awaited until the end of project to further create, implement and issue Open Badges matching micro modules. As the delivery and matching of learning modules, materials and ULOs connected with Framework were being tested by the samples in the Trials, there was the potential for changes to occur. Such changes could have derived from the feedback, or even by users' behaviour, in either micro module sub-division; milestone achievements, required training conditions and assessment materials. The wide scale issuing of final Open badges

to the market, could then face the risk of no longer match the package of materials or change of assessment criteria could compromise the validation of issued Open badges, ARISE results and equity and value of learner's achievements.

As moderators, was an import part of WP6 to ensure validity and quality control of the recognised QF achievement obtained in ARISE by participants. We decide to wait, as much as possible, also to allow that Open Badges issues contained already the Blockchain features update, which wasn't available yet during Trials launch.

The measuring, tracking and recognition of completion and achievement of qualifications was made and temporarily executed via the internal badging in the platform.

4.2.3 Areas for improvement

4.2.3.1 Materials

During Trials, continuous feedback was collected regarding materials quality via the platform. An initial set of training materials was piloted, enabling valuable data to be collated regarding their practical application, resulting in improvement of these and further material development. Feedback results and findings were communicated to WP5 at a regular basis, in coordination meetings and then with a collected internal report, directly from the Platform surveys in July 2024. These formed improvements of the materials throughout the Trials. The pilot action of blended classes with UK cohorts, also influenced the format and the modules added to Trials, for example to deliver BIM Application Specialism Pathway samples. These included several proposed modifications and extensions that have been reported in WP5 D5.3. Additional and modified learning content has been stress tested from July 9th until the end of Trials, and materials continued to be updated in tandem. The results from this trial phase were discussed in the D5.4 report.

4.2.3.2 Material Feedback Survey

The Main Survey Feedback on Course materials & quality had 218 responses, from which 89% were from Portugal. In terms of gender spread, 70 women and 72 male (others preferred not to disclose) indicates an equal balance of gender.

Other additional material surveys were with the UK blended delivery cohorts, obtaining responses from 15 users. Finding on those additional surveys were in-line with the ones in the main survey, with the exception of comments regarding supplying materials in local language.

Initials Surveys key findings

WP6 upon analysing the initial period of replies, concluded that users in general were positive and pleased with materials and training:

- most respondents believe the material met the training objectives.
- most respondents request for more training videos and improved graphics.
- strong emphasis in the desire for additional training in the users' language.
- Desire for BIM modelling training
- Desire for additional "*ArchiCAD*" training

Main Questions

QUESTION 1 - Please rate the overall quality of the training content on a scale of 1 to 5, with 1 being poor and 5 being excellent.

QUESTION 2- Were the course materials (text, videos, assignments, etc.) relevant to the learning objectives?

QUESTION 3- Were the course materials (text, videos, assignments, etc.) of good graphical quality and engaging?

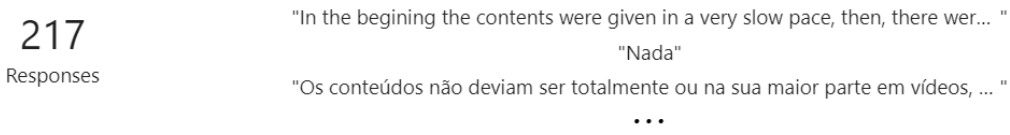
QUESTION 4- What aspects of the training content did you find most helpful?

- *Objectivity.*
- *Perfect.*
- *The next level, I suggest that a helpdesk line.*
- *Os videos na componente prática e pdf na componente teórica.*
- *Energy aspect related with BIM.*
- *Having small modules with specific subjects so you don't get overwhelmed with information.*

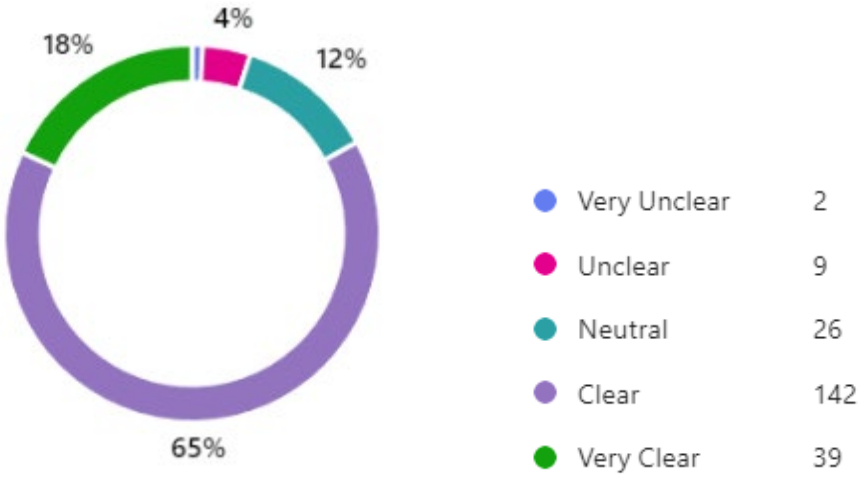
- *The possibility to go back and forward and to do the course at my own pace.*
- *Videos.*
- *Tests.*
- *BIM standards evolution.*
- *Virtual classes.*
- *All the explaining texts.*
- *Online training.*
- *Links to another websites that can helps to expand our knowledge.*
- *The diagrams in the video/slides to help breakdown information.*
- *Summary info.*
- *Demo videos.*
- *Course was available online full time.*
- *Videos and good graphical.*
- *BIM terms and benefits.*
- *Written content with illustrations.*
- *Well organised and structured Revit modules.*
- *Text and Bibliography. Some videos are more helpful than others.*
- *Legal and practical framework on the topic.*
- *Succinctness.*
- *All of them, and the general thinking about BIM across the world.*
- *Timetable.*
- *Tests.*
- *Helpful Instructor.*
- *Basic BIM Modelling.*
- *Modules.*
- *Course materials.*
- *BIM Application.*
- *The texts and links.*
- *Easy to use and not overwhelming amounts of information.*
- *Videos and clear explanations.*
- *Introduction to BIM.*
- *The website sequence of activities.*

- *E-learning method and support material.*
- *BIM and EE.*
- *Being micromodules helps to manage our learning time.*
- *The BIM dimensions module to understand in a very brief way the idea behind BIM. The explanation of OIR, PIR, AIR, EIR, AIM and PIM.*
- *All the materials were helpful.*
- *Assessments.*
- *Bim tools for energy efficient and Bim dimensions.*
- *New modules.*
- *Examples and case studies.*
- *The videos were the most helpful as we can replay them anytime.*
- *Overall content but should be downloadable.*
- *Nothing.*

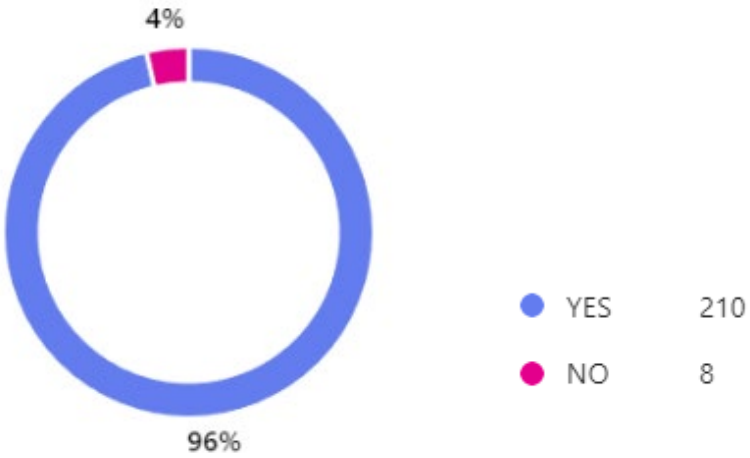
QUESTION 5- What aspects of the training content do you think could be improved?



QUESTION 6- How clear and well-organised was the course content?

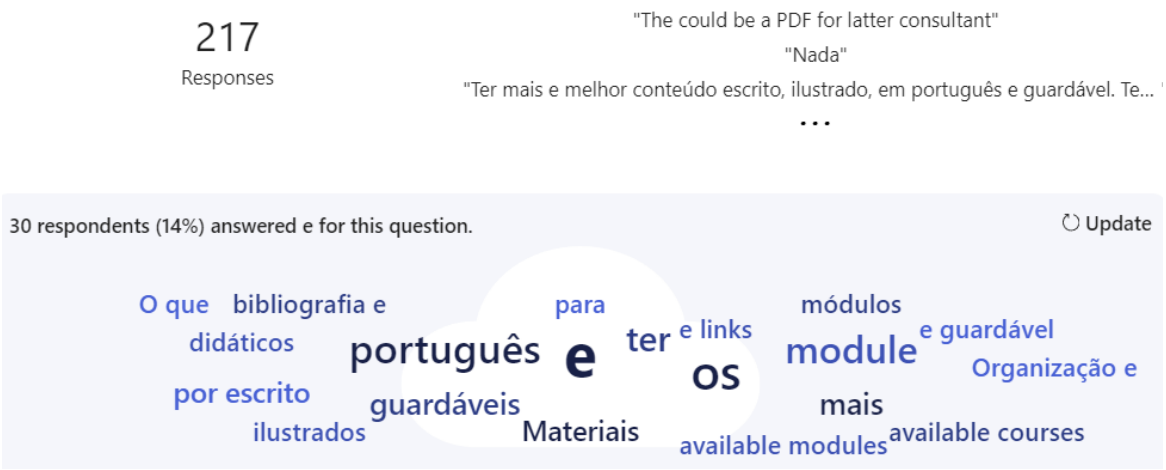


QUESTION 7 Were training objective and learning outcomes clear?



QUESTION 8 - How clear and easy was to navigate the training (learning environment)? On a scale of 1 to 5, with 1 being poor and 5 being excellent.

QUESTION 8a - What would you suggest to improve?



Findings: for purpose of reporting, instead of transcript of all answer WP6 analysed all 218 responses and identified main trends and aspects for improvement. Upon analysing the responses, there is a variety of comments and suggestions that indicated certain trends and common suggestions. A summary of the main improvement suggestion trends, based on the most common answers, and an approximate percentage indicating how many people mentioned each theme as listed below. There is also an indication of actions taken by ARISE team to improve or implement those suggestions.

Please note that feedback reflects certain moment in time, and that some of the issues originating some comments where dealt promptly and improved as they occurred.

Main Trends for Suggestions:

A) Contents in Portuguese: A significant number of responses (around 20%) expressed a desire for content, videos, and materials to be translated into Portuguese and made available for download or offline access.

ARISE actions *WP5 with WP6 included translation of several modules (both text and multimedia content)*

B) Organization and Accessibility of Modules: About 15% mentioned difficulties in accessing or navigating modules intuitively. Suggestions include for example:

- Sequential organization of modules (from basic to advanced).
- Clear markers to distinguish completed modules.
- Easier access to modules directly from the dashboard.

ARISE actions WP6 supported user that had navigation issues.

Virtual induction sessions were provided to help users know how to access modules. Additional videos created and disseminated.

Initial issues of accessing and other IT glitches were identified and corrected during Trials.

C) Use of Visual and Graphic Content: Approximately 10% of respondents requested more graphic content, such as diagrams and explanatory videos, to facilitate comprehension and content retention.

ARISE actions Following initial modules release, additional video content was added as main media for learning materials. Some of the comments may not reflect issues with Platform or ARISE packages itself, from example:

- Clear markers to distinguish completed modules.
- Easier access to modules directly from the dashboard.

Completed modules are indicated on the dashboard with a completion bar. And you can access module from dashboard in one click. We are assuming that users may be suggesting being able to enrol in modules directly from dashboard instead of having to navigate to course list and add them.

D) Assessment System and Feedback: Around 8% of the responses pointed out that the assessment and progress tracking system within modules could be clearer, suggesting more detailed feedback on performance in each module.

ARISE comment/action: Feedback on test assessment is provided at end of quiz, with indication answers that would need improvement. It is also indicated if leaner has passed or needs to repeat. WP6 conducted checks on modules to try and ensure that completion condition and tracking were setup properly.

E) Interactivity and Communication: Some users (about 5%) suggested more interactivity and communication with instructors, as well as better channels for clarifying questions and exchanging information with peers.

ARISE comment: Support contact form was available. Further communications were done to remind users where they could find the form. An internal message system was also available within the platform, which many users used during Trials. WP6 responded on average in less than 48h, or most time within 24h.

Summary of Common suggestions :

Content in Portuguese and Accessible for Consultation: Many would like more content translated and available in accessible formats, such as PDFs, for future reference.

Improved Organization and Navigation: There was a demand for improved organisation of modules, with layout and progress tracking suggestions to help users locate and complete modules easily.

Enhanced Visual and Graphic Support: The use of more videos, graphics, and visual representations was requested to make learning more dynamic and less text dependent.

Detailed Feedback and Clear Assessments: Some responses noted that it would be helpful to receive more detailed explanations on assessments and the scoring criteria within modules. These trends highlight the key areas for improvement in the platform's content and interface, with a focus on language accessibility, navigation clarity, and visual support for learning.

WP6 believes that ARISE has tried during Trials to acknowledge the suggestion and try to improve on most of them when applicable. However, the content is intentionally not downloadable to protect IP and copyright, and also to further incentivise the use of the platform in a constant basis.

Analysis of Positive and Neutral Comments

In addition to the specific suggestions and areas for improvement, several comments were either positive or neutral, expressing satisfaction with the

platform or general observations without critiques or suggestions for change. Here's a general breakdown of these responses:

Positive Comments

Approximately 10% of responses expressed satisfaction with the platform, indicating that users generally find the platform useful or that it meets their needs. Examples of these positive comments include phrases like:

- "Nothing to point out."
- "All good and clear."
- "Everything works alright."
- "Perfect."

These comments suggest that a portion of users is content with the platform as it is, or perhaps focused on its benefits rather than any specific challenges.

Neutral Comments

Around 20% of the responses were neutral, either indicating no specific opinion, with responses such as

- "No,"
- "N/A," or "don't know,"
- or simply observing minor points without any critic .

These comments imply that users either:

- May not have encountered significant issues or did not have a strong reaction to the platform's features.
- Might be undecided or reserved about providing feedback, possibly due to limited use or specific experiences.

Summary of Main Positive and Neutral Trends

10% Positive Feedback: Users who were satisfied with the platform and find it functional or complete. 20% Neutral Feedback: Users who did not express a particular opinion, either due to a lack of issues or limited engagement.

This breakdown indicates that 30% of respondents are either clearly satisfied or neutral toward the platform, while the remaining 70% provided some suggestions

for improvements. This balance suggests that, while portion of users saw room for enhancement, some users were satisfied with ARISE as it was.

The suggestions for improvement in the responses indicate a desire for enhancement rather than serious discontent. Most comments were constructive and suggest minor adjustments that could refine the user experience rather than pointing to fundamental issues or expressing frustration with the platform.

Here are the key takeaways regarding user sentiment:

Constructive Feedback for User Experience: Many suggestions are focused on improving navigation, organisation, or visibility within the platform—such as clearer indicators of completed modules, more intuitive access, and structured progression through content. These indicate that users find the platform functional but see ways it could be smoother or more intuitive.

Requests for Additional Features or Customization: Several users asked for more graphical content, interactive features, and translated or localized materials. This feedback shows an interest in enhanced learning tools, more varied content, and greater accessibility, rather than a lack of satisfaction with what's currently offered.

Technical and Usability Tweaks: Feedback about better translations, the option to mark completed courses, and clarity in module order mainly reflect minor usability tweaks. These comments point to adjustments that could make the learning process more efficient and organised, showing that users see value in the platform and want it to be more user-friendly.

Content and Structure Recommendations: Suggestions like adding diagrams, offering more examples, and organising modules by skill level reflect users' desire for improved learning aids and structured content. These suggestions highlight that users want to maximize their learning efficiency rather than signalling dissatisfaction with the current offerings.

Summary of Overall Sentiment

The responses lean towards enhancement-focused suggestions rather than signs of discontent. Users generally see the platform as valuable and effective but are asking for adjustments that would make it easier to navigate, more engaging, and

accessible. The feedback does not reflect serious issues but rather a positive interest in optimising the platform's potential.

Context and Evolution.

These represent the analysis of all responses. However, in practical terms, when evaluating over time, there were initial requests for training content related to practical and modelling classes request, Alongside this was the improvement and increase of graphical content, with addition of videos and demos, and requests for translation.

Towards the end, the suggestion trends change a bit in nature.

Some users suggest they would like to be able to download the training material.

If at first phase of trials, the comments were that it was too text hardy, recent comments now suggest adding also written material to accompany videos.

Some suggestion and requests on the order of modules in front end. Some issues with QA /spellings of translations. WP6 and WP5 worked on this comment to try implement as much improvement as per suggestion. Additional proof reading was undertaken. The order of the modules displaying in front end was also amended. It also indicated that users despite requesting at the start for less text-based materials, towards the end they requested more text-based materials.

Indication of preference for blended delivery is still on trend. Which indicated possible direction and recommendation for exploitation phase of ARISE?

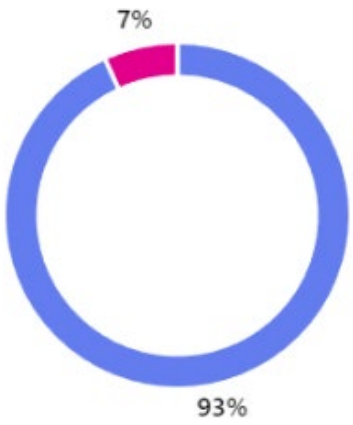
QUESTION 10 - Were the instructions and explanations given easy to follow?

QUESTION 10a - What would you suggest improving?

217
Responses

"There could be some material do dowload and study offline"
"Não"
"Ter materiais escritos, ilustrados, em português e guardáveis. Ter bibliografia...
...

QUESTION 11- Did you feel adequately support available throughout the training?

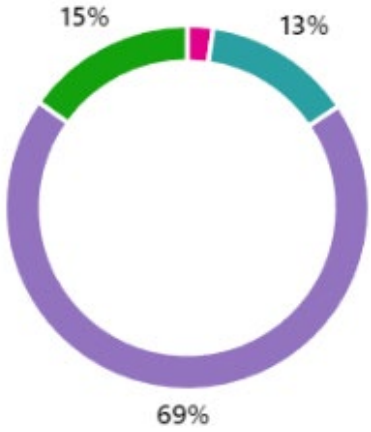


QUESTION 12-When applicable, were instructors and support staff responsive to your questions and concerns? On a scale of 1 to 5, with 1 being poor and 5 being excellent.

QUESTION 13- What additional support or resources would have been helpful to you during the training?

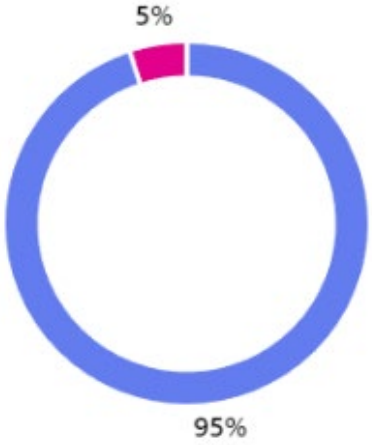
QUESTION 14-How effective was the learning methodology used in this training (e.g., pre- recorder lectures, live lessons, videos, presentations, reading materials, forums, practice exercises, assignments, recommended reading and links)?

Not Effective Option 1	0
Somewhat Effective	5
Neutral	29
Effective	151
Very effective	33



QUESTION 15-Did the course offer an adequate variety of learning activities and assessments for the subject content?

YES	207
NO	11

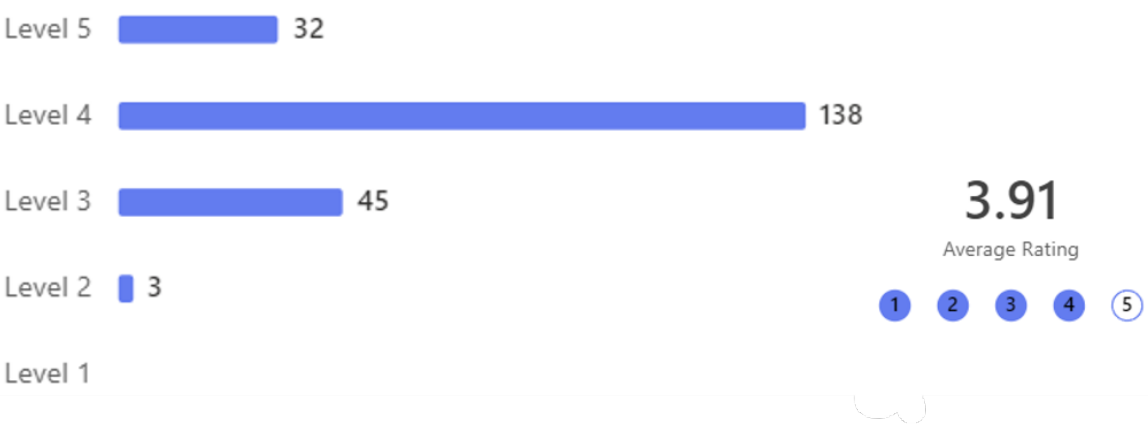


vvvvvv

QUESTION 16-What specific learning methodologies or activities did you find most beneficial?

QUESTION 17-Were the assessments (quizzes, assignments, exams) fair and aligned with the course material?

QUESTION 18 How would you rate the overall evaluation process on a scale of 1 to 5, with 1 being poor and 5 being excellent?



QUESTION 20-Were you satisfied with the course and quality of teaching overall?

Reassessing findings

Towards the end of trials, further replies were obtained to compliment the first finding in July. Overall, we had 217 responses to the survey regarding the ARISE training materials and quality, that was accessible via the platform.

- Most respondents, like in phase 1, believed the content to be clear and concise.
- The use of videos within the platform was noted as being very helpful.
- Some comments noted that the graphics for the videos could still be further improved.
- The inclusion of even further illustrations.
- Nearly all users noted that the training objectives and learning outcomes were clear.
- Clearer information about what stars, XP, and badges was requested.
- Near all users believed adequate support was provided throughout the training.
- All the learning methodologies were noted as effective.
- Most users believe there are adequate learning activities and assessments for the subject content.
- Some errors were noted in the quizzes. (typos of repeated input of answers) However this had been reported during trials via the support form, and WP6

addressed and amended accordingly as information on the errors was received.

- Some feedback requested more time to complete the course.
- Other feedback requested more videos as some of the text is extensive.
- The inclusion of software outside of Revit and Navisworks was mentioned again.
- The option to download materials was referred.

Together with WP5, some improvement based on the feedback were attempted, but can be further address duding future exploitation.

	Topic	Suggested training refinement
1	Videos	Better video quality and inclusion of more videos
2	Illustrations	More illustrations should be included either in partnership or instead of text.
3	Rewards	Further explanation of Stars, XP and badges.
4	Errors	Review materials and remove errors where required.
5	Software	More software-oriented guidance outside of Autodesk should be included.
6	Summaries	Summaries should be included at the end of modules.
7	Material Download	The Option to download material.

Table 9 – Possible improvement Pilot Findings

4.2.3.3 Platform

In terms of platform improvement, this has been addressed in WP4 reports. WP6 tested the platform in a robust way and served and support direct connection between user's and technical support from WP4.

Several improvements were applied to the platform prior to Trials including multilingual features, filters, and increased server capacity. The latter was to accommodate significantly more users than the initially predicted 300 participants.

As a live, innovative product and IT infrastructure, the platform requires regular updates, for example security, Moodle updates, and plugins. This naturally causes possible risks of interruption to previously functioning connections and features, which in turn need tested, identified, and resolved when they occur. During trail period, WP6 detect these including those “known unknowns”, which allowed for WP4 to resolve them promptly. There may be the other occurrences in the future, as well and “unknowns unknown” issues can arise when further and large experimenting with the platform occurs. Continuous monitoring is the key to ensure that any issues are captured and improved.

As exploitation of ARISE develops, and possible further modules and/or training plans are deployed, the already vast amount of content in the platform will also increase. From the perspective of manging the Trial process and materials in the back end of platform, possibly additional filtering, and navigation tools from managers and teachers regarding modules and course navigation may be considered. At present current tools were sufficient and management, but as content grows, then back-end UI may require some additional managing tools and that could allow to facilitate and speed up managing processes.

Features, capacities, and tools in the back end of the platform to better manage process and trials, and other improvements based on the user’s feedback were continuously discussed and weighted between WP6 and WP4, with input from WP5, to strike a balance of cost benefit development and implementation.

If IT structure allows it, possibly the ability to revisit or amend or update the internal digital badging (gamification) conditions could be good. From a management perspective running and moderation the trials, if any typo or error were to input during the badge creation, then it would have been difficult to change. A new badge version would need to be created. There a possible balance between validity and Quality assurance related to badges, and further improving practice management process tools and options, that may be worth further discussion and consideration for future development.

There was a comment in the feedback surveys in relation to users having to click enrol and add to courses, as “too many steps”. However, as designed by WP4 as an extra confirmation step before enrolment, WP6 also believe this is to be a required

feature. It ensures that users are intentionally enrolling on the model, and that enrolment don't occur due to users' navigation error. Until a more significant number of users indicate in feedback that his is an issue, we believe this is a good QA feature in the platform.

As the Framework is extensive, when exploitation proceeds and further pathways and modules are deployed, or even expanded, the full scope of categories of training plans will be issued. At that point, it may become too extensive in the front end and cause navigation issues to users.

Fig 6. Training plans

As such a front-end subdivision of the categories of training plans would be beneficial, in the form of submenu in the training plan. At present this can be achieved via the Sort by name, or even using the filter tool on the right. Both may be easier to use by users that know already a bit about the ARISE training and/or know what to look for. For novices, the addition of such subdivision/ filtering may be of use. It is not a priority, nor it was hindering the Trial delivery. Therefore, it was not pursued during this stage. But it may be something to consider in the future.

5. Recommendations

A set of future recommendations have derived from Trial upskilling actions.

Surveys finding on Framework (refer to Appendix 01) confirmed that the approach taken and proposed by ARISE was valid, so WP3, WP5 and WP6 were able to carry out their work based on that.

In the surveys, skills profiling and Skills gap assessment was analysed and used to recommend and inform the modules and contents produced by WP5 and WP6, for trial deployment and final package development. These finding were part of the source that inform an earlier WP6 proposal (D6.3 Report) for Training modules.

During trials sampling, and materials production, both WP5 and WP6 prioritised, according to time restriction and availability of resources, the modules that could

be produced and deployed more effectively, in the context of the task-based in the Framework and in identified modules in previous WP3 deliverable, during Framework development. The skills gap assessment was used to help make decision on what additional materials to include.

For future development, following on form Trials, we recommend that:

- the suggested extended proposal of modules (presented in D6.3 Report), to further respond to the finding of WP6, that were obtained in the survey's profiling and skills gap identification,
- continuous update and use of the skills surveys, and/or the assessment tools, both in the ARISE in the platform and the BUILD Up app, to further guide and prioritise the production and deployment of new modules and training plans.

Surveys on users' skills and post training satisfaction and teaching materials quality should also be kept maintained as an ongoing action. For that effect, the surveys deployed in the ARISE platform have not been set with a closure date. They are still currently live and actively collecting data from existing and new users. They have been indicated as mandatory (indicative only) in the Welcome trainers Module, to further try to mitigate possible survey fatigue or lack of interest of stakeholders in contributing to surveys. They can be set as a mandatory requirement/condition to complete ARISE training if required.

Survey's regarding quality of developed materials also served to improve the training package and inform further the work of WP5 and WP6, and to improve Trials deployment, and towards the final package of materials. Most immediate recommendation derived from direct feedback comments from users, were implemented during trials, with conjunction with WP4, and Wp5. Feedback and findings and regularly were communicated to other relevant WPs via correspondence and monthly meeting updates, to facilitate and recommendation to other WPs for improvement of their outputs, and to constantly inform and assist Trials delivery.

The adoption of regional language was discovered to be a more considerable factor than at initial conception of the ARISE project. Continuation and expansion

of material creation catered for local context and language will be important for the continued success of ARISE upskilling.

As reported also by WP5, the interim results report on the quality of materials feedback was communicated internally. These were actioned by WP5 and WP6, and resulted in improved materials, for example in inclusion of more images and illustrations, as well as creation of more instruction videos and tutorials, and of practical formative assessment task. These recommendations were also informing the development and improvement of the final package of materials.

However, after reviewing the final version of that feedback, at date of Trial closure, and with replies from 217 users, a few further complimentary improvements are still recommended. Some have been mentioned in WP5 D5.4 report as well in this report in earlier chapter.

The daily managing and moderation of direct support contact for users was completed by WP6, resulting in another direct form of feedback testing/trial. WP6 acted as contact from users support request and liaised directly with WP4 to identify and resolve any IT issues, and/or propose further improvements in the platform back-end, to better to cater for a smooth utilisation of Platform, by both users and ARISE trainer. Again, this has been mentioned in previous chapter and will be further referred in D6.6 report.

WP6 recommends that for future implementation permanent dedicated staff/team is available and assigned this task. E- learning platforms require constant and intense overview. This is not just for support in relation to errors or malfunctions, but on some occasions users may misinterpret or misread some instructions, and require further assistance. Also, by not having a regular “direct” contact with tutors in an online delivery, learners rely heavily on the support form to communicate any doubts of seeking reassurance.

On ARISE, this constituted a much more time-consuming task in delivering Trials that previously anticipated, especially when endeavouring to reply to users in a timely fashion, to keep engagement and satisfaction. Despite that WP6 was please to provide that assistance to users and ensure their satisfaction and support

towards the ARISE training during the trial period. This was noted positively by vast majority in user's feedback.

WP6 feedback results were also a base of recommendation for future implementation and impact assessment. Some future recommendations have already been mentioned in above paragraphs, as they were deemed of direct relevance to the context of this report. However, referred, and new recommendations are to be addressed and reported in the D6.6 report.

Exploration of the flexible nature of the Micro modules and processes to obtaining CPD points recognition can be initiated at exploitation phase of the project.

6. Overall Conclusion – inc. incorporated Appendix 01-D6.3-Feedback Report finding and conclusion.

WP6 carried out upskilling actions that demonstrated the developed upskilling materials by testing in both Consortium and other countries,

We engaged with a range of participants in direct market stimulus to increase demand for upskilling in sustainable energy skills.

The ARISE testing was utilised to demonstrate the multi-criteria benefits of the application of new digitalisation skills towards energy efficiency, and the tailored qualifications scheme for recognised competencies. Incorporated and facilitated by the with Upskilling action through deployment of the Platform., WP6 has worked to meet two objectives:

- validation of the developed matrix of competences and qualifications to increase market competence, incl. digital tools of delivery and certification, in terms of meeting market demand and industry needs concerning transferability and recognition (Please refer to appendix 01)
- increase in the capacity of the market drivers and actors, on both demand and supply side, to appreciate the benefits of the developed digitalisation skills and certification program, and to apply them in mutual collaboration.

ARISE faced the known anticipated barrier, identified earlier in the project by WP6 (and referred to in D6.1, D.2 and D6.3 reports)- the lack of willingness of professional

to spent part of their time to partake in survey, was recurrent during the project lifetime. WP6 worked and implemented measures to collet feedback, with a valid sample to test and validate the competence Matrix-Framework of Qualification, and the Arise training methodology with market stakeholders (related to tasks 6.1, 6.2 and 6.3) and to inform the follow-up WP6 tasks, as well as assist other WPs, for example WP3 and WP5.

The measures/ actions taken and used to obtain the required information, as reported, included the deployment of online surveys, by:

- participating and/or promoting events, such as live or online conferences or workshops
- online presentations, including to professional bodies,
- correspondence invites and request to professional bodies, public entities, associated partners, professionals, and SMEs to participate and or disseminate ARISE, leading to direct them to the surveys on the platform.
- facilitating survey with available experts,
- promoting regional feedback events,

This was all supported and empowered by the additional dissemination and communication work from WP8. We deployed these surveys about the Framework, including of competence assessments profiling and skills gap, and the Training methodology via the ARISE platform during trials, to increase reach and overcome the barrier of the survey fatigue. That allowed WP6 to further our reach. The findings validated the ARISE QF and allowed us to have a picture where the ARISE users gap was and confirm the pilot selection of modules was suitable to address some of those gaps.

The Trials testing and pilot of upskilling using developed materials and digital tools was carried out mainly using the ARISE platform as the main vehicle of delivery.

Pre-launch and during the trials, upskilling actions were carried out in a Blended format, in session with selected cohorts (virtual classes). This helped test materials, methods of delivery, as well methods and validity of assessment as well as ways and barriers related to how to carry such assessments in a wide scale test, and at even wider further scale during exploitation.

Other wider and open upskilling actions were taken during the Project lifetime in the form of Online Workshop, participation in Events, and other dissemination actions, for Example: Build-up online workshops, OA Workshop, BIM coordinators Summit, KEA Conference, Digital Construction Live Conference, etc...

Also, publication of articles, newsletters and social media posts facilitated by WP8, assisted WP6 to upskill the wider AEC community, on the demand and supply side, about the digital tools, their multi criteria benefits and the importance of training.

Survey's regarding quality of developed materials were deployed during trials, to inform and advise WP5, and WP6 on what and how to improve the training package further. Both during Trials deployment in updated iterations, but also towards the final package of materials. Feedback and findings were regularly communicated to other relevant WPs, via correspondence and monthly meeting interim internal updates, to facilitate and provide recommendation to other WPs for improvement of their outputs, and to constantly inform and assist the Trials delivery.

WP6 acted as contact for the users support requests (regarding It or any other queries). WP6 liaised directly with WP4, to identify and resolve any IT issues, and/ or propose further improvements in the platform, to better cater for a smooth utilisation of Platform, by both users and ARISE trainer. This allowed resolution of issues, improvements to the platform for wider scale release during exploitation in the future, and to most importantly, ensure Trails keep ongoing, that and learners felt supported throughout to stimulate and keep engagement.

A set of micromodules linked to the QF were created and released for trials. Accompanied by Training plans that allows to award and guide progression trough Specialism pathways of the QF, with milestone achievements. A final package of 40 modules was release. The Micro-modules were designed to be flexible, to stimulate uptake and transferability, and to facilitate mapping for CPD point recognition application, and/or other Qualification mapping.

As final summary of upskilling action results: at the end of the project lifecycle samples of developed maturity level-based skills and qualifications, with accompanying digital tools have been tested.

WP6 has:

(a) developed a sample of the matrix of competencies, learning outcomes, and training models and tools.

(b) implemented of these in wide-scale demonstration and tests across Europe.

(c) tested the application of the method for representative recognition of competences in sustainable energy skills trials, upskilling and capacity building, via digital micro badging.

(d) connected to learning sources & micro-learning activities, development of additional learning and assessment sources and materials.

With the upskilling actions, WP6 has:

- Confirmed suitability of maturity level matrix and framework content, as well as training material approach, methodology, and Format.
- Demonstrated Benefits and impact of applying of acquired skills; and
- Collected feedback recommendation for WPs to improve their outputs.

Most importantly, the upskilling actions resulted in an increase of skills capacity in AEC stakeholders, with 3361 AEC related professionals taking part of the trials via the ARISE platform. 2395 participant actively enrolling in ARISE Trials sample micro-modules. More than 300 users (415) completed assessment criteria) modules.

Most users in the platform, involved in the Trials, were from an SMEs background, but we also have participants from larger companies, and employed by Public Administration Authorities. An additional larger number of project participants was also reached in upskilling support direct actions from WP8 dissemination, via interactions with the website, social media, and other events, raising the AEC awareness and recognition of benefits of the tools and in increasing the demand for skills.

Appendix

Appendix 01
D6.2 Report Follow-up-Framework-Competence Matrix-user's survey.

Publishable executive summary (Appendix-D6.2)

This relates to the previously published D6.2 deliverable, that was meant originally to summarise the outcomes of surveys conducted to users regarding the Matrix of Competence/ Framework and Training Methodology.

ARISE published the D6.2 report, exploring the approach, methodology and production of survey/ questionnaire to obtain public results regarding the *Qualifications Recognition Scheme and Maturity Level* - developed by WP 3. It summarised the proposed strategy for the ARISE survey questionnaire that would be testing the ARISE overall methodology, tools for maturity assessment, and the competence matrix proposal. The work developed was directly and indirectly associated with WP6 two main objectives:

> *1. Validation of the developed matrix of competences and qualifications to increase market competence, including digital tools of delivery and certification, in terms of meeting market demand and industry needs concerning transferability and recognition*.
>
> *2. Build the capacity of the market drivers and actors, on both demand and supply side, to appreciate the benefits of the developed digitalisation skills and certification program, and to apply them in mutual collaboration*.

The questionnaires had been designed to be presented to market stakeholders, to obtain valuable and relevant feedback, thus providing improvements as necessary to ARISE outputs. They aimed to increase long term impacts, as well as to create a positive reception towards ARISE upskilling actions, from the market stakeholders, addressing objective 1.

The proposed survey format allowed several actors to comment

- on the framework,

- on their understanding of concepts and benefits of digitalisation skills (BIM in particular) and associated energy efficiency,
- on their personal skills within that context,
- and evaluate if, and how, the proposed Framework conceptually can offer them a suitable upskilling pathway.

With the survey exercise, participants were encouraged to self-reflect and recognise the advantages of recognition and validity of skills for improvements of the workforce, and its contribution to increase employability and job mobility. This addressed objectives 1 and 2.

At the time of publishing D6.2, there weren't enough participant willing to respond to surveys to allow the publishing of results. It was then deferred to be included upon release of D6.4. This Appendix covers the results and findings of the survey(s)

A1. Intro and Background

This Appendix report is a continuation D6.2 of WP6. It relates mainly to Task 6.2- *Surveys of competences training scheme packages.*

It's connected to the achievement of *Completion of initial testing of concepts, methodology, and matrix of competence stage, w*hich entailed the production of *D.6.1 Package of testing materials for qualifications recognition scheme and maturity* level (see D6.1 report for further details) and *D.6.2 Survey Report –user's feedback on the competence matrix.* (see previous D6.2 report for further details)

This appendix serves as a follow-up to compliment the previously published report: D.6.2 Survey Report – user's feedback on the Competence Matrix/Framework. It is connected to Task 6.3 - Production of the 1st survey report. This present appendix includes the Survey results that were presented to market actors, to gauge their opinion and recommendations in relation to ARISE QF matrix of competencies, concepts, and learning methodologies.

At the date of the D6.2 publishing, and as the combined result of the justified increased production and publishing time of the Framework by WP3, ARISE had trouble in engaging with target audience. There was an unwillingness to reply to surveys in significant numbers and to mitigate the risk of "survey fatigue", WP6's strategy was to defer the surveys report, to ensure a wider uptake and consequent validity, effectiveness. This appendix was proposed in Report D6.2, with WP6 suggesting the results would be reported and integrated into D6.4 report, to compliment the D6.2 Report, with the results that were not available at that time.

The surveys became an integral part of the Trials Materials and, therefore it is logical to include them with this Report.

Despite the high direct engagement and reach of the ARISE project with the market stakeholders, a widespread across regions and a willingness of the public to engage in survey responses was difficult and limited. It backed up the identified barrier and risk that WP6 had reported on. WP6 was still able to collect some responses from users to test and validate some of the ARISE outputs. The following Appendix reports the surveys and the results.

A2 First Market Survey- Skills Maturity Gap Assessment

A survey was disseminated, both in promotion and direct-action events, as well as with and direct link in the platform. The survey was design to collect a multitude of useful information to the project, in addition but linked to the original intention of validating WP3 works. For that effect we combined in the survey:

a) profiling questions to identify the type of stakeholder, and region, to capture what target groups ARISE was obtaining more tractions with.
b) based on the Matrix of Competence and Maturity we collected information to validate the concept of the maturity assessment format, and to provide a compass pointer to focus the trials materials selection, to better engage with the needs of the target audience that was more actively engaging with ARISE.

A2.1 Participation & Results

We had a total of 149 responses.

A2.1.1 Profile

Gender

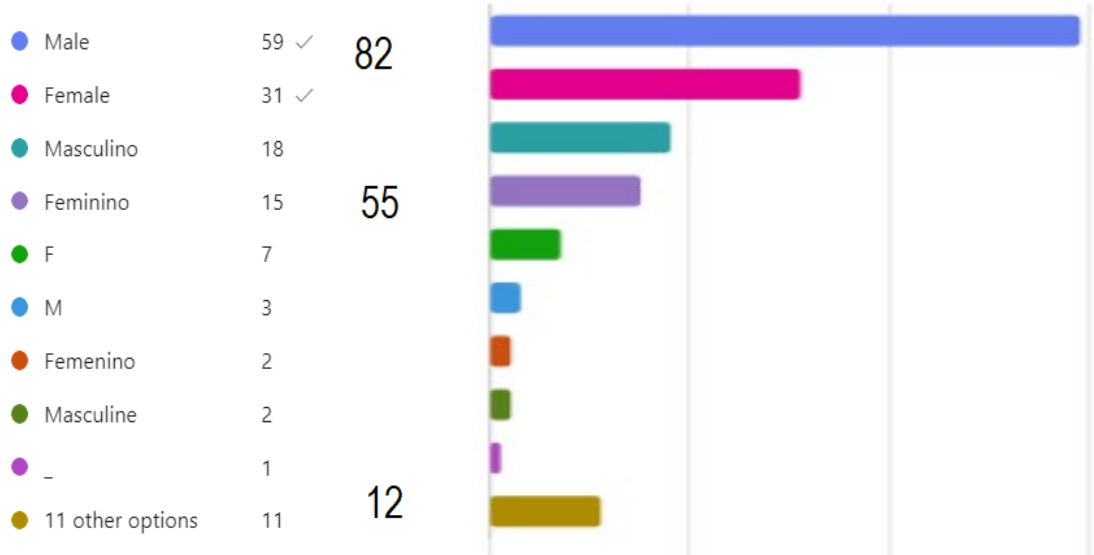


Fig7: Gender Statistics Graph

- Male 82
- Female 55
- Others 12

Nationality & Residence Region

There was a slight variation between nationality of users and country of Residence. In terms of regions, majority of replies were from Portugal 112 (53%) and from the UK 22 (15%), although some of the UK responses may be from Irish nationals. This is in keeping with overall ARISE results, as these were the two regions main were ARISE was getting more participative interactions. Uptake by other regions such as Macedonia, Italy was increasing at the very latest stages of the Project.

Nationality		Regions	
Portuguese	113	Portugal	112
Irish	17	Ireland	3
British	4	UK	22
Spanish	3		
Other	12	Poland	1
		Norway	1
		Belgium	2
		Others	8

Table 10 – Survey results by regions and nationalities

Education Level

The majority had a higher education level (Degree/ Master's Degree)

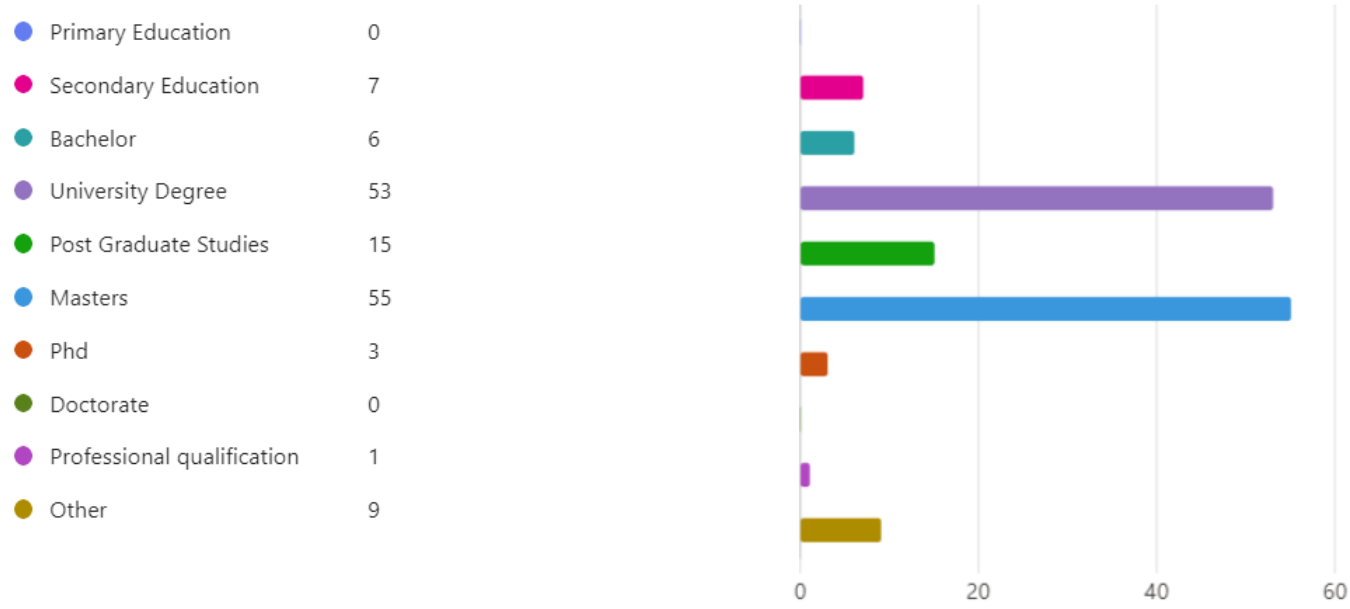


Fig8: Education Fig 8. Level results graph

Fields and Areas of study

The audience was primarily linked to Architecture.

- Architecture: 123
- Civil engineering: 2
- Architectural technologies: 2
- Town planning & urban planning: 3
- Engineering and civil protection: 3
- Mechatronics engineering: 1
- Quantity surveyor: 7
- Management: 1
- Other: 5

However, regarding occupation and roles, it is slightly more varied, providing a marginally better sample.

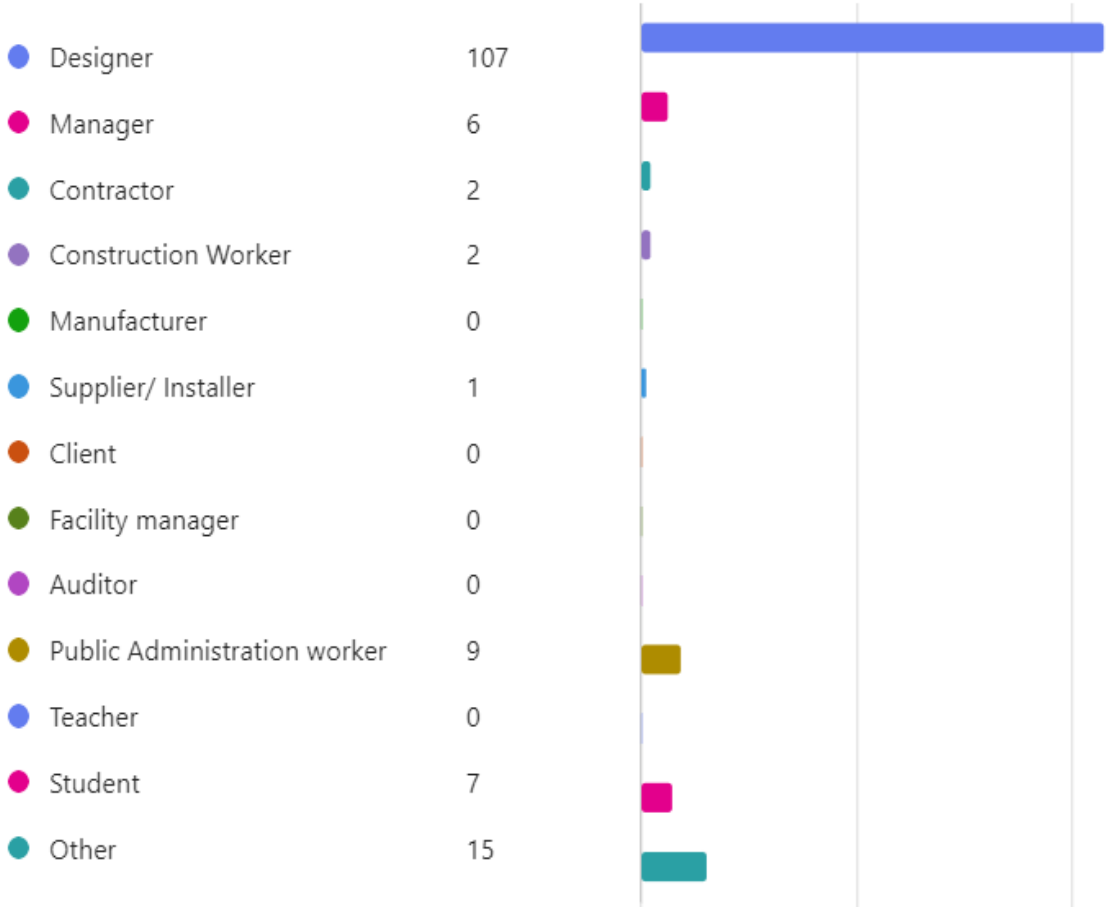


Fig 9: Roles category results graph

- Construction works: 2
- Contractor: 2
- Designer: 102
- Management position: 5
- Public administration worker: 9
- Installers: 1
- Students: 7
- Others: 21 (raging from quantity surveyors, students, sole traders)

Majority working in SMEs. Only 2 working in companies with more than 500 workers.

A2.1.2 Impacts on the Industry and for EE derived from the user's average workload and nature of projects:

Majority of the users that have replied to the survey call are enrolled into the Arise Platform. those users indicated that, in a yearly basis, they work on average in the following types of projects:

- Residential
- Public Spaces and Infrastructure
- Mixed used
- Commercial
- Industrial
- Legalisation of existing buildings

These ranged from newbuilds, renovations/Retrofit of both public and private buildings. Combining the data of all that have replied to this survey, and making the sum of the average project size(m^2) and multiplying it by the average number of projects per year, gives us that the total estimated/average area of work carried out yearly by this engaged group, amounts to an average of 1,079,030m^2

A2.2 Skills Gap Assessment Questions Results

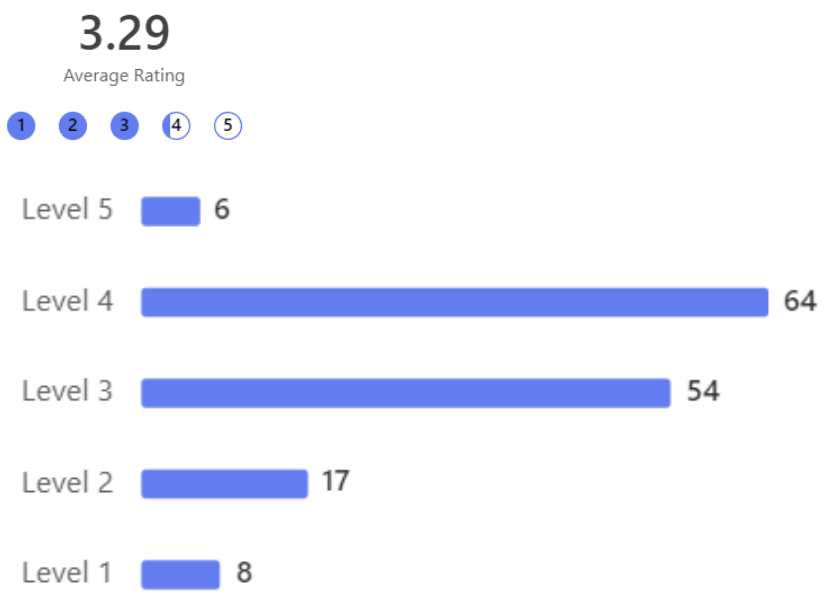
Based closely on the 5 maturity levels, users answered the following.

Skill level definitions		
1		Has **little knowledge and skills** with respect to the relevant field / technology
2		**Understands basic knowledge** and has practical skills within the field, is able to solve problems by selecting and applying basic methods, tools, materials and information
3		Has c**omprehensive, factual and theoretical knowledge**, is capable of solving problems within the field
4		Has **advanced knowledge involving** a critical understanding of theories and principles and skills, required to solve complex and unpredictable problems in the field and is aware of the boundaries
5		Has **specialised knowledge and problem-solving skills**, partly at the forefront of knowledge in the field, in order to develop new knowledge and procedures and to integrate knowledge from different fields

Fig 10: Maturity Skills

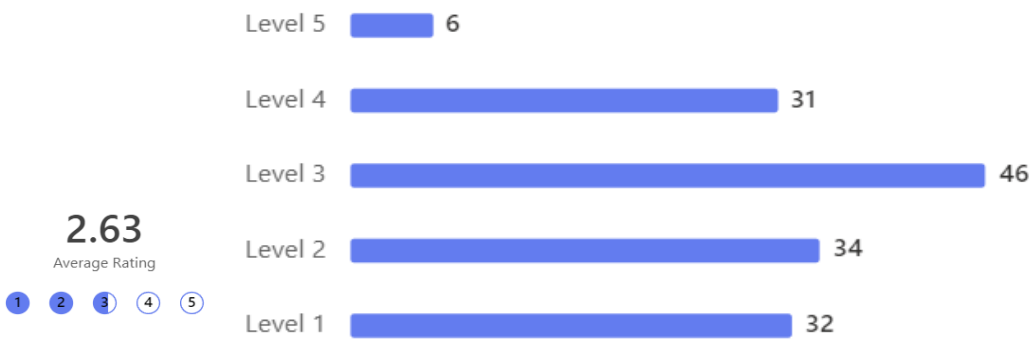
QUESTION 1 :

. From 1 to 5 (being 1 low and 5 highest) please classify how far are consider the level of digitalisation skills you posses...



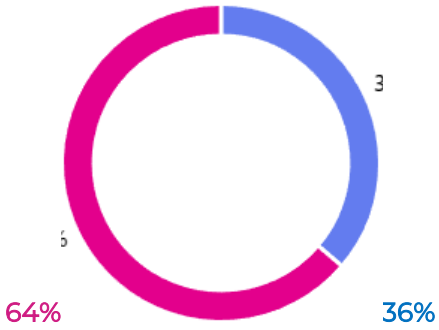
QUESTION 2 :

. Please rate from 1 to 5 (1 being low and 5 very high)
How knowledgeable are you with BIM and BIM principles, terminology and methodology?



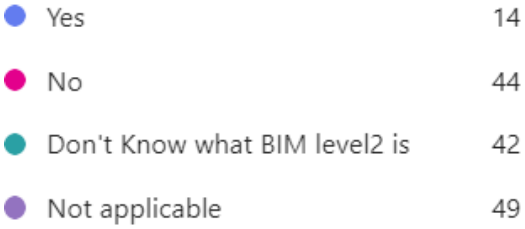
QUESTION 3 :

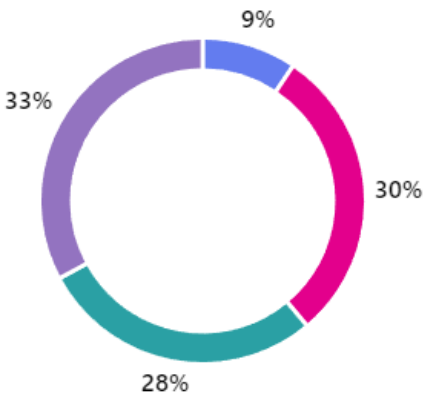
Do you already use or have used BIM



QUESTION 4 :

If you already use BIM, are you working at a BIM level 2 requirements





QUESTION 5 :

What subjects your require training to improve your digital skills and efficiency? (pick all that may apply to you)

Fig11: Maturity Skills Gap Survey

A8.3 Conclusions taken from the findings of this survey.

After deploying the survey and evaluating the answers, we concluded that the skills maturity level is a useful and applicable benchmark for skills mapping and gap assessment. However, if used for more generic, less defined queries, it may risk originating some possible not accurate assessment. But when complimented with follow up questions it becomes a very useful tool to identify skills gaps and trends.

For example, regarding digitalisation scale and BIM terminology and methodology, most users rated it almost edging the mid of scale, with a 2.6 scoring. However, analysing consequent answers, it seems to have been an overestimation, as then, when asked if they had used BIM, the majority answered that they hadn't, and about application of BIM stages requirements, majority seemed not to be aware of these. This indicates that the true skill/ knowledge is possibly bellow the initial 2.6 score.

When asked in relation to the areas of required upskilling, the following were some which the score was quite high in the upskilling desirable list:

- BIM standards.
- General Bim concepts and Benefits
- Bim modelling.
- Digital construction also scored higher than expected.

Based on these results, the Trial sample of digital tools focused on including modules that would cover these subjects.

A9 Survey- Qualification Recognition Scheme (Framework)

A quantitative and qualitative survey was disseminated, both in promotion through direct-action events, as well as communication and with direct link within the platform. The survey was designed to validate Matrix of Competence (Framework and competencies) and teaching/ learning Methodology:

- profiling questions to identify the type of stakeholder, and region, to capture what target groups ARISE was obtaining more tractions with.
- continued to collected feedback to validate the concept of the Framework Matrix of competencies.

It also further contributed to provide additional information regarding skills gaps based on skills maturity.

A9.1 Participation & Results

We had a total of 112 responses.

A9.1.1 Breakdown of user's profile by:

Gender

- Male 54
- Female 52
- Others 6

Nationality & Residence Regions

Again, majority of replies were from Portugal 93, followed by the UK residents 12 responses.

Nationality		Regions	
Portuguese	91	Portugal	94
Irish	8	Ireland	2
UK	4	UK	12
Spanish	1		
Others	8	Others	4

Table 11 – Survey results by regions and nationalities

Education Level

The majority had a higher education level (Degree/ Master's Degree)

Fields and Areas of study

User's field areas were linked to:

- Architecture: 82 (Working in a PA: 16)
- Engineering: 2
- Quantity surveying 2
- Architectural technologist/Technician: 3
- Draftsman 1
- Town planning & urban planning: 1

- Coordination 1
- Process operator 1
- BIM Management 1

Roles

And acting in roles such as

- CEO 7
- Architect 72 (Working in a PA: 16)
- Project coordinator 1
- BIM Designer/ modeller 2
- BIM Manager 3
- Design Engineer 2
- Energy Consultant 1
- Expert Adviser1
- Manager 3
- Process Operator 1
- Project manager 3
- Quantity Surveyor 2
- Roof Truss Designer1
- Other: 13

Majority was employed, including in 14 public authorities:

- Employed by others 94
- Self-employed 17
- Unemployed 1

Participants worked for both private and public companies, that include a mix of included architectural, engineering, project management companies. And worked in PAs, such as:

- Instituto da Habitação e da Reabilitação Urbana, I.P.
- Secretaria Regional dos equipamentos e Infraestruturas - Madeira
- Direção Regional do Equipamento Social- Divisão de Projeto"
- Secretary of State for Housing (Ministério das Infraestruturas e Habitação)
- Câmara Municipal (City Council) de Lamego
- Câmara municipal (City Council) de Lisboa

- Câmara Municipal (City Council) de Lamego
- Câmara Municipal (City Council) de Mafra
- Câmara Municipal (City Council) da Maia
- Câmara Municipal (City Council) de Mértola
- Câmara Municipal (City Council) de Setúbal (Setúbal City Council)
- Câmara Municipal (City Council) de Vila Nova de Poiares
- Câmara Municipal (City Council) do Funchal
- Denbighshire (City Council) County Council

A9.1.2 Estimated future Impacts on the Industry and for EE, derived from the user's average workload and nature of projects:

Majority of the users that have replied to the survey call are enrolled on the Arise Platform. They indicated that, on a yearly basis, they worked on average in the following types of projects:

- Residential
- Public Spaces and Infrastructure
- Mixed used
- Commercial
- Industrial
- Renovations

These ranged from newbuilds, renovations/Retrofit of both public and private buildings. Combining the data from to this survey and making the sum of the average project size(m^2) multiplied it by the average number of projects per year, gives us that the total estimated/average area of work carried out yearly by this engaged group, amounts to an average of 367766m^2.

A9.2 Skills Gap assessment profiling

Based closely on the 5 maturity levels, users answered the following:

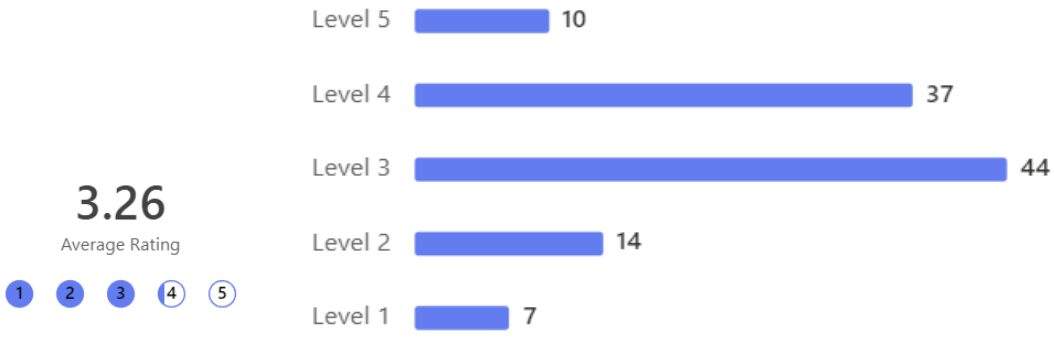
Skill level definitions		
1		Has **little knowledge and skills** with respect to the relevant field / technology
2		**Understands basic knowledge** and has practical skills within the field, is able to solve problems by selecting and applying basic methods, tools, materials and information
3		Has **comprehensive, factual and theoretical knowledge**, is capable of solving problems within the field
4		Has **advanced knowledge involving** a critical understanding of theories and principles and skills, required to solve complex and unpredictable problems in the field and is aware of the boundaries
5		Has **specialised knowledge and problem-solving skills**, partly at the forefront of knowledge in the field, in order to develop new knowledge and procedures and to integrate knowledge from different fields

Fig12: Maturity Skills

Note: as some users had already started the ARISE trial , when answering this survey, so their skills base may had already increased.

QUESTION 1

From 1 to 5, please classify: how far are you in your digitalisation route?



QUESTION 2:

What Digital Tools and methods do you currently use in your work?

112
Responses

"Autocad"
"I use BIM programs whenever I can, up to the 3D dimension."
"Autocad, Zoom, Whatsapp, Google Drive"
...

Digital tools	spread
2D examples	55%
Just 2D (Autocad)	
None	
Office 365 and CAD	
Photoshop, excel, word, draftsight, acrobat, visoid (AI)	
Progecad 2010	
Progecad, Office,	
Ferramentas cad, office, etc	
Autocad, Office 365, Ms Project, Acrobat, Adobe Photoshop	
CAD systems, Office tools, Adobe tools	
Zwcad	
ZWCad é um software idêntico ao AutoCAD	
Mix of 2D and 3D (non BIM) examples	10%
AutoCAD, 3Dstudio Max, Corona Renderer, Revit, Office	
AutoCAD, Lumion, MS Office Sketchup, Qgis, InerCalc	
CAD (autocad), 3D modelling and rendering (Lumion, Blender)	
CAD 3D max	
CAD Office, 3D Modelling	
CAD, SketchUp	
Sketchup	

Twin motion	
SolidWorks, AutoCAD Teams	
Mix of 2D and 3D (BIM inception) examples	10%
Autocad, Archicad, Twinmotion, Unreal Engine	
BIM (MEP, structural, architectural), point cloud, GIS	
3D BIM	15%
AutoCAD, Photosop, Indesign, Ilustrator, Skechup, Revit	
Revit	
Revit & Autocad, Microsoft business software, Proactis portal.	
Revit, Autocad, Sketchup, Trimble connect e outros na ótica do utilizador	
Revit/Navisworks/ACC	
(BIM Advance- Maturity Skill 4 and above possibly)	10%
Revit for creating BIM. digital laser scanners with bluetooth for direct to computer plan creation. LIDAR and photogrammetry	
Energy modelling (Design Builder), BIM (BRICSCAD BIM), EES (Engineering equation Solver)	
For drawings/3D I use MicroStation, AutoCad, SketchUp, Revit and 3DStudioMax. Adobe Creative Suite.	
I use BIM programs whenever I can, up to the 3D dimension.	
Laser scanning, BIM, other	
Most Autodesk Products	
MS tools; Autodesk tools; Adobe acrobat	
REVI/Navisworks/Plannerly/ACC	

Table 12 – Survey results in skills assessment- digital tools

Findings: majority still in 2D processes (BIM maturity level 0 or 1) low in the ARISE Skills Maturity. But some users starting to apply BIM modelling, with some apparently in more advanced workflows. Some responders have after initiating the ARISE training- possible influence in pushing digital skills up already. Due to the number still using 2D/3D not Bim based and just 2D processes, we believe that the initial Skills maturity rate (question 1) may be higher than reality.

QUESTION 3:

What skills would you find useful to include in ARISE FRAMEWORK to be and considered for training and implementation? Why?

Findings Some responders weren't sure or indicated generic subjects that are already explicitly in the QF, for example "BIM". Others provided favourable answers to the QF and ARISE approach, but not relevant to this question, for example "bite size modules". WP6 analysed the replies and selected the most relevant trends that may constitute a possible specific "add-on", special focus, or that were useful feedback to be implement in Trials and/or exploitation. We communicated findings to WP5 in coordination meetings, to help make and evaluate Trials and modules. These were as follows:

Comment	Action (when relevant)
Practical BIM application (Architecture and Engineering) to develop a model	Emphasis on the subject was given during Pre-trials and trials by ARISE
Training in specific BIM software, for example Revit (Large number of responders) and ArchiCAD	ARISE focused on one due to resources. But module structure allows for exploitation of different ones under same QF structure
BIM Project Management	Related modules considered
Include Circular construction; to be integrated within the circular economy	
5D schedules and rendering	Related modules considered
BIM implementation for companies	Data management modules considered. BIM requirement and Standards relate to this.
BIM management and implementation	
Implementation of the data from external companies (interoperability)	

	BIM Management QF specialism also covers this
Support documents with 'rules' for the procedure of realising a type of project in BIM. (standards)	Standers and EIR module related to this
Data Analysis and Critical Thinking, evaluation is an essential component of ARISE. The ability to interpret data and apply critical thinking is necessary to assess the effectiveness of innovations and interventions, identify areas for improvement, and make evidence-based decisions. Facilitate explanatory and demonstrative content, in written and video formats, for future reference and consultation	Modules contained different format of materials, including written book and videos.
Blended classes/ virtual classes	Virtual sessions were arranged
Scheduling of quantities, 5D (recurrent subject in answers	Included
More practical training	
Publishing BIM Information	
BIM Modelling (HVAC)	It is possible to incorporate in the Bim Application Bim modelling Specialism, and a subcategory. And relevant to other QF tasks.
Advanced BIM skills (modelling and methodology)	Was Included in QF and Trials
3d rendering	Covered in QF
Intelligent models for different stages of asset lifecycle	Concepts covered in Bim Basics
Tools to improve workflows and efficiency.	Covered in general by applying digital tools and BIM methodology and knowledge of software UI.

guidance concerning BIM tools and management	Covered in general in Trials and overall part of the overall QF concept
Solar studies and geolocation	Considered as module for Trials
BIM Project Planning	QF in Project management and Bim project Management, and covered in Modules such as BIM 4D
Automate tasks regarding customer survey and analysing anomalies in construction and finishes	Clash detection. Model Reviews. Confirmed in the QF
introduction of new construction materials that are energy efficient	There was consideration for a possible "material library" module to be included. Pre-production took place.
3d Printing,	Part of the QF. Possible for future exploitation
Software Plugins	Included in trials
Import 2D CAD to BIM	Subject considered to be cover in Trials
Model Federations	Covered
BIM Coordination	Integrated within the QF and covered in Trials
GIS/Infrastructures applications, for urban planning/projects	Integrated within the QF
Bioclimatic analysis of a building	Integrated within the QF
BEM, incorporated with BIM	Integrated within the QF
BIM Object creation	Integrated within the QF
BIM introduction	Requirement of building skills from the ground up - Bim Basics Specialism
Bim tools for different uses and phases	BIM Basics including Bim Dimensions is starting point for this.
Translation into local language. Learning BIM at the start with complex terminology in another language, for people who aren't very versed in English is hard.	Translation was included in trails.

Direct access to the ISO 19650 standards	There are issues of Copyright. Direct links to access provided. But Standards were including in Trials
use of different plugins related to energy efficiency	
Methods of coordinating Revit models, posting to CDE and integration into asset management software.	CDE module
Lifecycle and embodied energy assessments.	Considered for inclusion.
Interoperability including Cobie	Approached in Trials. Part of QF
Understand other BIM Dimensions (4D, 5D, 6D, 9D)	Covered
Overview of software involved in BIM	Covered

Table 13 – Survey results additional skills suggestion.

Findings of this question: In general, most of the suggestions can be integrated into the QF Groups, their Specialisms, and including either explicitly or implicitly in the ULOs. The comments were under review and consideration when planning iterations of pre-production and production of Trials, and for consideration of possible expansion of Trial module programme and or exploitation phase.

The feedback data reflects a comprehensive interest in a wide array of BIM (Building Information Modelling) skills and applications across several levels, from practical software training to advanced BIM management and data analysis. Key trends include:

1. Core BIM Skills Development

Practical BIM Application (Architecture and Engineering): There is a strong interest in hands-on, real-world applications, with a particular focus on architecture and engineering models.

Specific Software Training: High demand for Specialised training in popular software such as Revit (noted as a primary request by a large group of respondents) and ArchiCAD.

BIM Modelling for Specific Disciplines: Users highlighted a need for expertise in HVAC modelling, 5D scheduling, 3D rendering, and intelligent models across different lifecycle stages.

2. **Advanced BIM Management and Integration**

Project and Data Management: Respondents expressed interest in learning BIM project management and BIM implementation strategies for companies, emphasizing management skills in coordinating projects and understanding BIM processes within organizational settings.

Interoperability and Data Sharing: A recurring theme is the integration of external data, interoperability standards (e.g., Cobie), and the ability to import and merge data from 2D CAD or different BIM software, which shows a need for efficient, collaborative workflows.

BIM Project Planning and 5D Scheduling: Project scheduling, especially 5D (cost-based scheduling), is highlighted as a critical skill, along with knowledge of lifecycle and embodied energy assessments.

3. Specialised Topics and Emerging Technologies

Circular Economy and Sustainable Practices: The inclusion of circular construction concepts to align with circular economy goals, bioclimatic analysis, and energy-efficient construction materials reflect a focus on sustainability.

Energy Analysis and Integration with BIM: Topics such as solar studies, BEM (Building Energy Modelling) integration, and the use of energy-efficiency-related plugins illustrate a growing need to incorporate environmental considerations within BIM.

Innovative Construction Methods: Interest in 3D printing, GIS applications, model federations, and intelligent models for asset management indicates a forward-looking approach to construction technology.

4. **Supporting Materials and Learning Resources**

Standardisation and Documentation: Respondents request access to standardised support documents, procedure guidelines, and direct access to international standards like ISO 19650, which signifies a need for standardised workflows in BIM.

Language Accessibility: Many users noted that complex BIM terminology, often presented in English, poses a barrier, especially for beginners, indicating that localized translations would be beneficial.

5. **Learning Formats and Content Delivery**

Blended and Virtual Classes: There is notable support for flexible learning formats, including blended and virtual classes, which allow both practical, in-person learning and online accessibility.

Explanatory and Demonstrative Content: A strong preference for practical, demonstrative content in both video and written formats highlights the need for resources that users can easily reference and review.

Summary of Main Trends (by Approximate % Share):

- Specialised Software Training (Revit, ArchiCAD): **20% - 25%**
- Project Management and Data Integration Skills: **15% - 20%**
- Sustainability and Energy Modelling within BIM: **10% - 15%**
- Standardisation, Interoperability, and Documentation: **10%**
- Learning Format and Content Delivery (Blended learning, video): **10%**

In summary, the responses emphasise a holistic approach to BIM training, with a strong focus on practical software skills, advanced project and data management, sustainable practices, and user-friendly learning resources.

QUESTION 4:

What skills digital and construction you already have, that would like to be "formally recognised" in your ARISE user profile?

112

Responses

"I have skills at a 3D dimension level of a BIM program, but since it is archica... "

"None."

Findings Once more some of the answers were not applicable to the question not the most relevant to ARISE QF application. And a majority indicated more subjects that they would like to learn new rather than prior knowledge. WP6 analysed answers and filtered them into the following:

Comment	Action (when relevant)
Ability to develop Architectural projects including visualisations. recognition of software knowledge	Covered in QF and Trials
Data Cloud & BIM	Covered in QF and Trials
BIM Management Skills	Covered in QF and Trials
Circular Economy	
Understanding of BIM	Covered in QF and Trials
Revit basics	Covered in QF and Trials
Every skills possible	
Beginner level, training in BIM MANAGEMENT, in 2018, that was not followed due to lack of necessary tools	
Project Manager / Site Manager	Not direct scope. But skills in tool to perform such task can be recognised.

	Possible Specialism/ or sub specialism for exploitation of QF
ISO 19650 (most important), REVIT (secondary)	Covered in QF and Trials
Autocad, Microstation, 3D Studio, Revit *- languages* *- H&S courses*	
sustainability courses (LIDERA, BREAM)	
No need to be recognized, just need domain of knowledge	There is still in the industry the trend of professional to just wanting to learn and not "caring" about obtaining qualification
BIIM Management	
BIM manager | Autodesk Certified Instructor Platinum	For future exploitation, possibly setup automatic process of recognition and enrolment in modules that could be mapped to other certified programs- The Autodesk in specific.
Thermal behaviour of components	Some trial module covered that.

Table 14 – Survey results skills recognition of prior knowledge

Following some of the answers WP6 revisited the Autodesk Certification scheme compare ARISE trials Preproduction and Production. The comments about recognition of Certified programmes were interesting and worth further exploration as to how the mapping and automatic recognition could be done.

Possibly in the future: LTI tools can communicate between different platform and automatically grant the equivalency. Currently, an ARISE manager can enrol student into specific mapped modules, and grant automatic badging, if learned presented evidence of prior achievement.

Consideration about automatic recognition was discussed in the Consortium, between WP3, WP4, WP5 and WP6, and relevant to WP7 market implementation. Similar discussions were held regarding recognition of skills obtained in other present and past H2020 programs.

QUESTION 5:

What other digital construction skills do you require? (0 point)

112
Responses

"3D modeling"
"Knowledge of a software that can estimate energy efficiency from the very b..
"Bill of Quantities linked to a BIM model."
...

Comment	Action (when relevant)
BIM overall Knowledge	Included in QF. Partially addressed in Trails
BIM modelling skills *(majority of responders)*	Included in QF. Partially addressed in Trails
ArchiCAD & Revit	Included in QF. Partially addressed in Trails
BIM management *(several responders)*	Included in QF. Partially addressed in Trails
AI	Included in QF. Part of final conference
Drone Survey	
Energy Efficiency (several responders)	Included in QF.
Rendering programmes	Included in QF.
3D, VR, AI	Included in QF.
software for energy efficiency calculation	Included in QF.
Microsoft Project	More modern alternatives available

Typical Microsoft programs and NBS Specification writing	For consideration
4D and 5D	Included in QF.
Federation	Included in QF.
Digital solar studies	Included in QF. Considered for Trials
6D	Included in QF.
AR & VR	

Table 15 – Survey results of further subjects

A9.3 Framework- Qualification Scheme Questions

QUESTION 5:

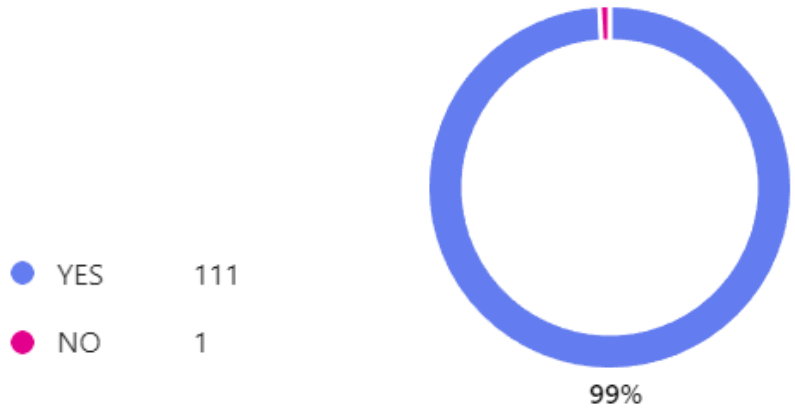
Do you agree with the Framework Grouping as a possible- valid and viable- approach?

If you answered NO, WHY? And would propose anything else differently or additionally? And if you answered YES, you could justify or simply answer N/A (0 point)

- *"It's a flexible system. Nowadays, it's important to understand that training courses must allow trainees to have that flexibility, as it's often the first obstacle that arises."*
- "Need straightforward approaches".
- "lost time"
- "Because it is a positive way to reinforce the use of what we learn here."

Findings: Majority agreed, comment left didn't justify the 4% that answered no. The majority left positive comments or no comment showcase and a suggestion of assuring flexibility:

QUESTION 6 : Do you consider BIM BASICS as a Specialism that can serves as the initial foundational knowledge for all Qualifications and should be part of your basic skillset?



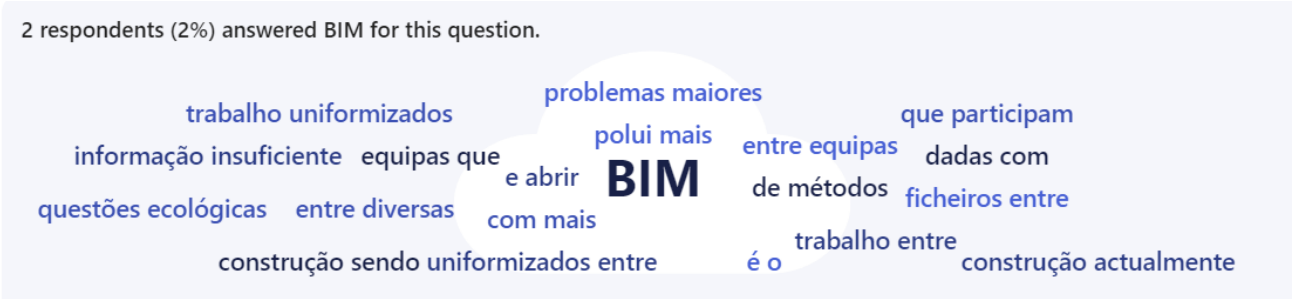
If you answered NO, WHY? And would propose anything else differently or additionally? And if you answered YES, you could justify or simply answer N/A (0 point)

Findings: Majority agreed, Comment reinforcing that a good base knowledge of concepts is key

QUESTION 7 :

Regarding the BIM SUPPORT Specialisms: Do you agree that these can be Specialism and Qualifications regarding technical support related to BIM?

If you answered NO, WHY? And would propose anything else differently or additionally? And if you answered YES, you could justify or simply answer N/A (0 point)



QUESTION 8 :

Regarding the BIM UTILISATION Specialisms: Do you agree that these can be specific skills, suitable and applicable to several AEC professionals?

If you answered NO, WHY? And would propose anything else differently or additionally? And if you answered YES, you could justify or simply answer N/A

QUESTION 9 :

Regarding the BIM APPLICATION Specialisms. Do you agree that these specialisms and skills are related and applicable to specific responsibilities and roles within the AEC professionals?

If you answered NO, WHY? And would propose anything else differently or additionally? And if you answered YES, you could justify or simply answer N/A

QUESTION 10:

Do you agree that the ENERGY EFFICIENCY Specialisms can be and form a series of skills, that can be applicable and useful to various AEC professionals, and imbedded into all other AREAS, as part of their skillset in this field?

Findings: Majority agreed, A comment refers that this could emphasise the holistic nature of the subject

QUESTION 11

Do you agree that a Framework of Areas-Specialisms- tasks-subtask based format, with associated ULOs approach is a valid and applicable approach to learning, and to facilitate upskilling?

QUESTION 12

Can you see the merits / benefits of adopting a TASK and SUB TASK BASED APPROACH to a Curriculum Framework?

If NOT: Why? And what would you suggest improving?

"Complexity tends to overshadow efficiency in learning".

QUESTION 13

Do you agree with the several groups, specialisms, tasks, subtask, and ULO examples overview?

If NOT: Why? And what would you suggest improving?

QUESTION 14

Do you agree with the ENERGY EFFICIENCY (embedded and cross disciplinary) GROUP, Specialism, tasks, subtask, and ULO examples?

If NOT: Why? And what would you suggest improving?

"Divide energy efficiency areas depending on engineering speciality."

A9.4 ARISE Teaching & Learning and Assessment Methods & Tools

QUESTION 15

Which is your preferred learning, Methods? (0 point)

Comment
Online by subject
Exactly how ARISE has it: Modules and online classes
Tutoring
Bite-sized classes
Old school - reading, always taking notes and revising, whether it's an online class or not
Videos
Online classes
E-learning
Tutor-led

Videos
Organised list of courses to take, without needing to add modules
Virtual classes
Online tutorials
Project-based or practical exercises
Follow along with short videos (10 minutes)
Mix (online and in-person)
A mix of individual learning and synchronized sessions
Hybrid: mostly asynchronous course with synchronous sessions for practical parts and opportunities to clarify questions
Practical workshops
Studying/Practical
Online, with 24-hour access as convenient
Description of practical and objective examples
Study materials that correctly explain the content to be understood and assimilated
In-person, video, synchronous classes
Distance learning via video/written materials
Video/text/pdf
Online
More practical content with fewer surveys like this
Pre-recorded videos, with potential blended sessions

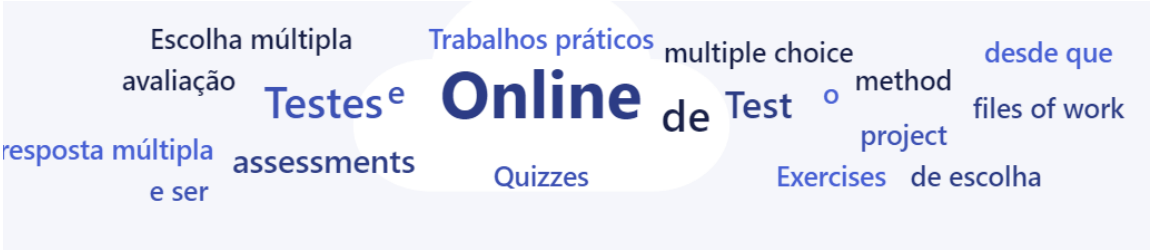
Table 16 – Survey results about learning materials

Findings. Answers did not match fully with list of learning methodologies. But indicate satisfaction with ARISE methods. Not surprising as majority of participant

had enrolled on the ARISE platform. Positive indication for videos and online delivery. Also indicated that punctual blended session would be welcomed.

QUESTION 16

Regarding assessment methods, which are your preferences?



Comment
Multiple choice test (majority).
Then a multitude of other preferences
Exercise based
As in ARISE platfrom
Coursework
No preference
Multiple choice and image identifying exercies
Short quizzes. project based assessments
Mix (online and in presence)
Project based
I'm fine with the present arrangements
Clear questions, tricky questions do not serve the purpose
Exercises as homework.
A small project done face-to-face or online.
I think it works well to have small assessments to close modules, rather than a single assessment, as it helps to consolidate subjects. In addition, closing steps has an encouraging effect, like a snowball effect. There is a feeling of accomplishment that motivates you for the next steps
Tests with multiple-choice answers and sending files of work carried out for evaluation
Practical exercises

Assignments
Submit model

Table 17 – Survey results about assessment

Findings. The majority was for online Multiple choice. And in general users seemed happy with ARISE methods. Second preference was for more practical project-based assessment. Feedback comment to improve assessment was to consider same number of attempts in all modules. Maybe a build-up of small assessment instead do just a final one (that can be helpful in longer on more complex modules with multiple ULOs covered)

QUESTION 17

Since COVID19, online education has become common. Are the methodology and resources proposed by ARISE sufficient, in the context of professional training, to motivate students with a 24/7 access? Do you suggest anything additional resources/features?

QUESTION 18

Do you see the benefit of upskilling based on the ARISE Framework for construction professionals and stakeholders to gain valuable new digital energy efficiency enabling skills, and/or allow recognition of current or experience, increasing your employability /job mobility?

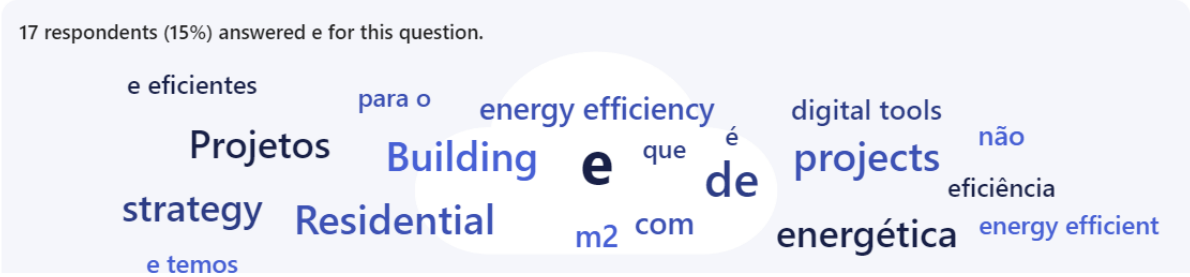
A9.5 Current and future usage and applicability in construction projects

QUESTION 19

What size and type of project do you work on? Presently what are the strategies for energy efficiency? Is it supported by digital tools and methods?

112
Responses

"Normally projects up to 500 m2 I'm always looking for new energy-efficient ... "
"I work with 150 m2 projects, but other departments work with a bigger scale..."
"Mainly I work in housing renovations, with around 150 m2. The main strateg... "
...



Note: This question served to inform material and module choices, but also for later to better help measure of application and impacts of ARISE project

Findings Combining the data from to this survey and making the sum of the average project size(m^2) multiplied it by the average number of projects per year, gives us that the total estimated/average area of work carried out yearly by this engaged group, amounts to an average of 367, 766m^2.

QUESTION 20

Do you predict that you/your company will be involved in projects applying NZEB (near zero energy buildings), requirements in the near future, and you will be using some of the ARISE FRAMEWORK proposed skills to assist you?

Projects p/year Average size (m^2)	What size and type of project working on presently what are the strategies for energy efficiency? B) Is it supported by digital tools and methods?	you/your company will be involvement projects applying NZEB (near zero energy buildings), requirements soon, and using ARISE QF Training to assist you
5 projects- 300m^2 average	Projects are mostly residential. The energy strategy is based on acquired experience. On calculations performed by the engineering team.	YES Medium term
one project 20000 m^2	building needs to have the LEED certificate	company has sustainability pillar that and we want to improve it. ARISE will help
1000m^2	All types and sizes. Yes	YES
200 m^2	From early inception	YES
80 projects 250m^2	All projects must meet energy efficiency requirements	YES
500m^2; 5	small residential projects; passive house strategies no digital tools	YES
150 m^2	Habitações, podendo ser apartamentos isolados (renovações) ou edifício multifamilares.	YES. Projects need to meet EE criteria as per PRR.
1000	Present strategy is contracting engineer.	YES

	Engineer Uses digital methods	
vários	Habitação, todos os tamanhos. Materiais mais ecológicos e eficientes. Sim	YES
500m²	efficiency building materials	YES
3 to 4 Variable depending on the type of municipal building.	We don't have any programmes for this yet. the project obligations already include these objectives. We work with external teams who are able to respond to these issues and legal obligations.	YES
8000m²	In school and building for PRR. Sim emplyeing external engineers	YES
400 m²	N/A	YES
150m²	projetos residenciais projetados de forma a aproveitarem de forma positiva os recursos existentes	YES
10 projetos 200 m²	In certain Council But very few stategires for EE AutoCAD	YES
20 a 30 projects 100 to 350m²	Residential. Some strategies Yes but basic tools	YES
23 projects 450m²	always looking for new energy-efficient materials to implement. No digital tools yet.	YES
1000	Without EE strategies	YES
50 projects 1000 m²	Large Offices, Warehouses and Shops	YES
2 projects 300 m²	residential and tourism, passive design, proximity natural materials and efficient equipment.	YES

	Not supported by digital tools	
10 projects per year	small and medium size projects. The strategies for energy efficiency are the required by legislation. don't use digital tools in the process.	unsure, but we should
2000m²	£1000,000 up to £10,000,000	Unfortunatly only if mandatory
20	Very few	YES
25 - 50 projects 100m²	£5,000 up to £5,000,000	YES
2 or 3 major projects average 2.000 m²	projects are generally outsourced. Every one of them includes strategies for EE with requirements higher than those required by law.	Hope so
350m²	EE strategies But not supported by digital means	Don't know
500m² 10	Residential, the strategies for energy efficiency are not supported by digital tools	YES
4 projects 50 and 1000sqm.	None.	I can't predict what will happen, as clients have the last word on that, that but I would like my projects to have the possibility of applying.

Variable.	Variable. From housing to Master Plans. Presently Solar Panels	YES
400 m^2	Try to get the best EE performance. calculation partially manual	Unsure
12m^2	small buildings and renovations. The energetic performance of the building is calculated old school. Aim to create building with the less energetic impact.	Yes, that's our goal.
10 projects 150m^2	Supervision of large-scale residential construction (buildings and houses).	Probably yes, it's the future of construction.
10 projects per year 10000m	N/A	YES
3000 - 5000 m^2	Residential, renovations -- about 3000 m^2; there are no digital strategies yet for energy efficiency	Probably yes
1 to10 projects 300m^2	Apartments and housing construction methods and materials for EE Those strategies are not supported by digital tools.	Maybe

150 m²	Mainly I work in housing renovations, The main strategies are linked with the integration of more energy efficient equipment's (such as heat pumps, etc.). Those strategies are not supported by digital tools.	I agree. In general, most architecture firms will indeed need to adapt to a new construction reality soon, one that demands high energy efficiency standards and an extensive use of digital tools to increase efficiency and competitiveness. The ARISE Framework aligns very well with these new industry requirements, supporting this shift in construction practices.
25 projects 300m²	We work on residential, commercial, and hospitality projects, with more rehabilitation than new construction. Our energy efficiency strategies largely depend on the financial capacity of our clients and the choices they want to adopt. We always aim to design and implement basic construction principles that allow buildings with fewer resources to be more efficient. However, in Évora, we face many constraints in adopting renewable energy	YES, I believe so. I think we all have a duty to align our projects with NZEB (Nearly Zero Energy Building) guidelines. We participate in some competitions where these requirements are already considered. I believe that BIM (Revit and ArchiCAD) is an excellent way to address all current

	techniques and systems within the historical center. .We implement many passive measures to improve energy efficiency and adopt active ones when the project and its location permit Not digital	construction considerations, and implementing NZEB buildings will be easier with standardised work systems for everyone.
30 1000m²	We work minimally on energy efficiency, only covering the basic mandatory requirements.	Maybe
500m²	currently working on new building around	YES
20 projects 30m²	Small projects. Passive Houses	YES
10 projects 1500m²	Mega and large-scale projects, fully supported by BIM implementation	I most certainly do
4 projects 200 m² e 4	They are low-cost residential projects, so for now, I'm still unable to apply highly efficient energy strategies.	Yes, I learned excellent fundamentals with ARISE that I hope to implement in future projects.
_	No EE strategies	YES
2 to 5 projects 300m²	300m², residential mainly, working with engineers, no digital tools	YES
4/5 200/300m²	Single-family homes, farms, rustic, rural, and urban buildings. Compliance with building regulations and thermal efficiency	Maybe not in near future but gradually

	design. Digital tools and methods are used in part.	
10 600m²		possibly
4 300-600m²	Low tech bioclimatic strategies and high tech as photovoltaic panels, collection and reuse of rainwater, etc.	YES it will help to gain skills
3	1000m² residential	YES
500m²	Energy relies on preliminary BER certs	YES
10000m²	Residential and commercial. use of high spec insulation, green roofs. Drawn in CAD, better more efficient digital processes would help	YES
2000m²	Public buildings, for now CAD and outsource engineers for EE	Possibly
5000 m²	Parliament building supported by a digital tool.	probably
6	I work with 150 m² projects, but other departments work with a bigger scale. The strategy for energy efficiency is to implement some changes and construction materials in the buildings that are known for improving the energy efficiency. But it is not supported by any digital tools yet.	The institute is already obligated to work with NZEB requirements, since it is a public institute that works aligned with EU standards and demands. Hopefully it will implement some of the skills proposed

		by the Arise framewok in a near future.
N/A	Industrial projects, fairly large, small residential, energy efficiency is paramount, yes.	Hope so.
10-50	Mostly Retrofit	Maybe
1000	Public Housing (social and affordable) . nZEB+20 (RRP) are the energy requirements.	YES
9 projects 100 m²	No, I mainly work on interiors and apartment rehabilitation in residential and commercial areas. Energy efficiency issues don't come into play, as the scope of work doesn't extend that far.	I hope so, however, it will depend on the type of clients and their requirements.
250 m²	Trabalho ao nível da arquitetura e conforme o que o cliente tem para elaborar ou edificar. A eficiência energética é feita com a colaboração de peritos classificados pois é obrigatório por lei	YES
250 m² / 4 projects	The strategy is to avoid thermal bridges, install high-performance windows, apply exterior insulation (capoto), and provide moisture protection. Nowadays, almost	The client and the available capital determine the type of construction to be carried out. If it involves NZEB

	everything is done using digital methods.	requirements, the skills proposed by the ARISE FRAMEWORK are helpful
variable Mid-sized	don't use any tools for energy efficiency would like to know about them	YES
1500	A mix from refurbishment of public buildings, school extensions, new schools, new and refurbished housing. Advice from external consultants and internal energy team incorporated into building projects. Digital tools are used but it could be better coordinated.	YES
120 m^2	Passivhaus. Sketchup Excel software from Passivhaus Institute.	YES
10000m^2	Revit Navisworks ACC	YES
4 projectos 2024 10200 m^2	Housing and Schools. NZEB Since NZEB - 20% was one of the requirements that applications for the PRR (Recovery and Resilience Plan) had to meet, we have already taken this issue into account in our projects. No digital (BIM) tools	YES

10000m²	Big infrastructures, retrofit and new construction. Digital calculation of thermal and dimensioning structures - outside modelling software.	YES
250m² to 350m²	passive one (managing the interior space according to the better sun exposure possible, by developing the geometry of the building to increase the comfort of it (manage shadows barriers, sunscreen, isolation, natural ventilation, etc.). Also managing the kind of materials	YES
3 projects 2000 m² 5 projects 300 m²	Edifícios de habitação multifamiliar Excel	YES

Table 18 – Survey results for future consideration of potential impacts of ARISE

Note: RR refers to the Plano de Recuperação e Resiliência (Recovery and Resilience Plan) In Portugal, the PRR refers to the Plano de Recuperação e Resiliência (Recovery and Resilience Plan), which is part of the European Union's strategy to support member states in recovering from the economic impact of the COVID-19 pandemic.

It includes funding for various sectors, including architecture and construction, with a strong focus on sustainability, energy efficiency, and digital transformation.

For architecture and construction, the PRR promotes investments in projects that contribute to green building practices, energy efficiency (including NZEB—Nearly Zero Energy Buildings), and the modernization of infrastructure. It also supports the adoption of innovative solutions, such as BIM and digital tools, to improve construction processes and environmental performance.

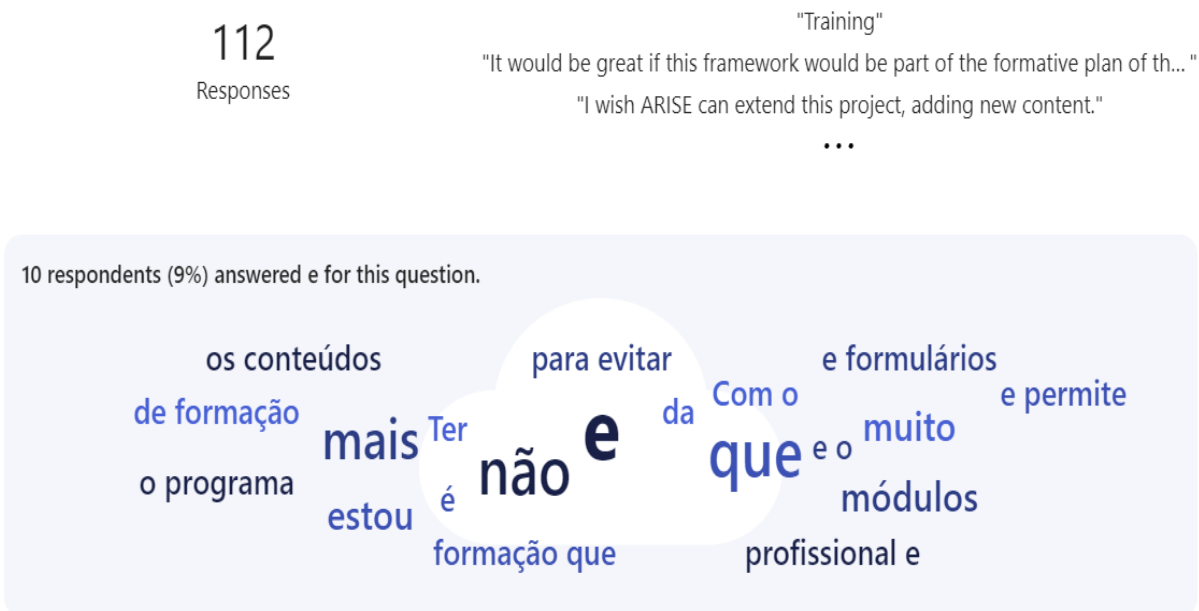
Overall Findings of questions 19 and 20

WP6 compiles and translated the answers (from Portuguese). Majority is/or will be involved in EE buildings, including Nzeb. Most see the benefit and used/will use ARISE skills (part of participant replied to survey already during Trials. In some answers it shows the importance of the demand side (client) for application and EE strategies and deployment of skills. Generally, ARISE QF and Trail training receive according to users was/ or will be applicable and utilised towards EE.

A9.6 Final Conclusion question

QUESTION 21

Any further comments or suggestion for the ARISE programme and for a Proposed Framework



Findings: After analysing answers, WP6 compiled the most relevant and applicable answer that were then considered for improving of ARISE trials, programme and Framework approach can be found as follows:

Comments from users
To ensure Q&A. and Full release of complete training plans instead of modular uptake
Include Circular construction
Promote constats with companied that do the inspection of buildings
Be able to save training contents
"So far, the ARISE program and the proposed framework seem to be well-structured and useful. I am pleased with the suggested approaches and the relevance of the skills presented.
Promote more online classes format
Include BIM Modelling in HVAC
No, very satisfied
NO, grateful to take part
"I believe the program and the learning system are exemplary. It is flexible and allows anyone to follow at their own pace, review content, adjust schedules... it's a very comprehensive program, and I am very happy to have been able to participate. I congratulate you on all the support and work done. It is a training program that fits perfectly into the current professional lives of technicians.
It would be of great value if the option to become a certified BIM Instructor could be included.
It would be great if this framework would be part of the formative plan of the public sector. Maybe some sort of collaboration with the government is an interesting way to implement digital tools and to spread the knowledge as the norm.
Continue post trials with more modules
To be able to support us in the future by giving us access to the documentations that we`ve been using to study now.
"The content needs to be better organised and in a logical sequence, It becomes a bit confusing to organize the content."
Ensure training in Portuguese
I would like to see the modules/content and training programmes continued over a longer period. 2024 to 2025...

Table 19– Survey results about improvements suggestions

WP6 considered some of the comments and tried to implement them. Exploration of the training plans should provide solution to the comments about lack of structure and to help visualise the QF and pathways. That was the intent on setting those Training Plans visible in the platform- to respond to some of these and future concerns. In exploitation period seeking further recognition opportunities for ARISE seem to be of public interest.

A9.7 Conclusions taken from the findings of this survey.

Overall, the survey offered insight on current skills gaps, and the requirements of users. Such data was analysed and used to inform WP5 and WP6 of the modules and materials to include, add, or improve in Trials. It also tested the acceptance of the ARISE QF by users, offered opportunity for users to directly suggest improvements and additions. Regarding this aspect there was a bit of confusion by some users about keeping comments connected to QF and methods of delivery of such, instead of feedback on Trials when some users had already initiated training.

In general, however users expressed satisfaction, with WP6 interpretation that participants have validate the ARISE proposed QF and Matrix of competences,

A10 Workshops & International Events & Conferences

During the project, leading up to, during and post trials, ARISE, as part of WP6 activities participated in a range of events. We also organised our own events in association with other organisations, to present the ARISE QF and collect feedback. These also promoted interaction and participation, with survey questions presented as SLIDO interactive quiz format, facilitate by WP8. Even when events didn't raise the expected "volume" of feedback, useful feedback was still obtained. Findings were usually in-line with other surveys, positive and supportive of the ARISE QF, methods and learning tools. There were no comments of note that could indicate issues to consider regarding the validation of WP3 Framework, nor the methodology of delivery and overall ARISE approach. Such ARISE events referred included:

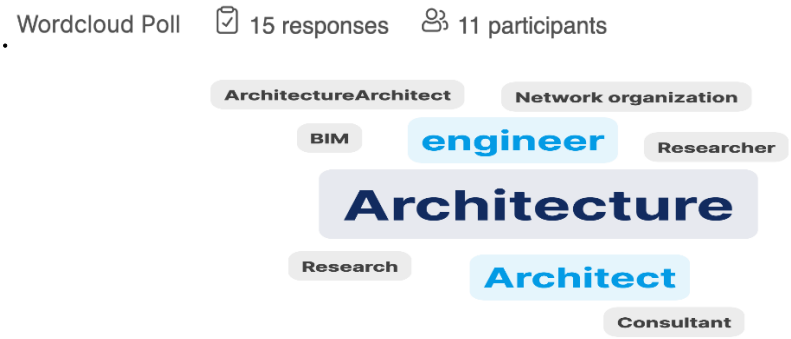
A10.1 Brussels Workshop (live)

A live/online workshop was held in Brussels in March 2023, from the *Auditoire V.Bourgeois –ULB Campus Flagey,* in March 2023- "Learning bites on green and digital skills for the built environment". The ARISE project was presented, as well as the QF and the upcoming platform and trials. A SLIDO survey was incorporated into the presentations with some of the main QF and learning methods questions. There were 30 participants joining the event. On average around 40% provided answers to the survey. The findings were again in general positive and supportive relating to the QF and overall ARISE approach, even if limited. Due to nature and duration of the event, qualitative answers were not collected in the SLIDO, but were sought during Q&A. Results presented as follows:

A10.1.2 Profiling

Question 1 Which City are you joining from today?

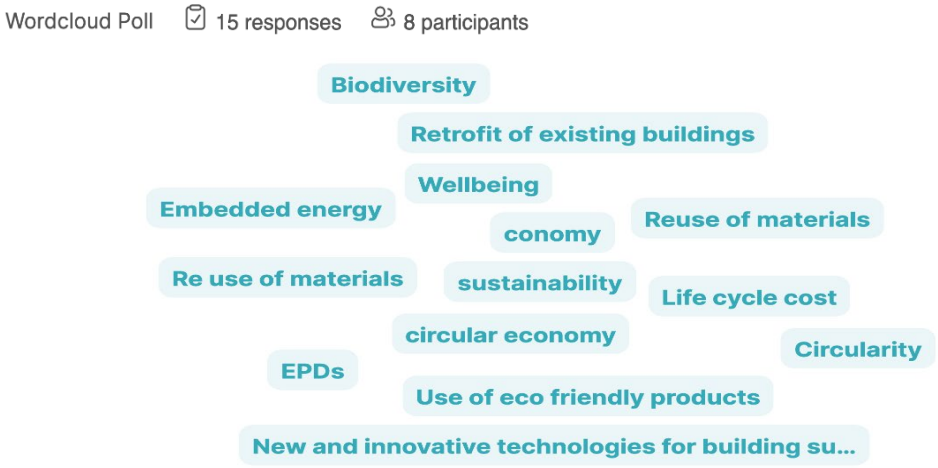
Question 2 In maximum of two words, write your profession or area of work.



GENERAL SUGGESTION FEEDBACK

Question 3- Suggestions

What topics (next to Energy Efficiency) should be added to the Qualification Framework next?

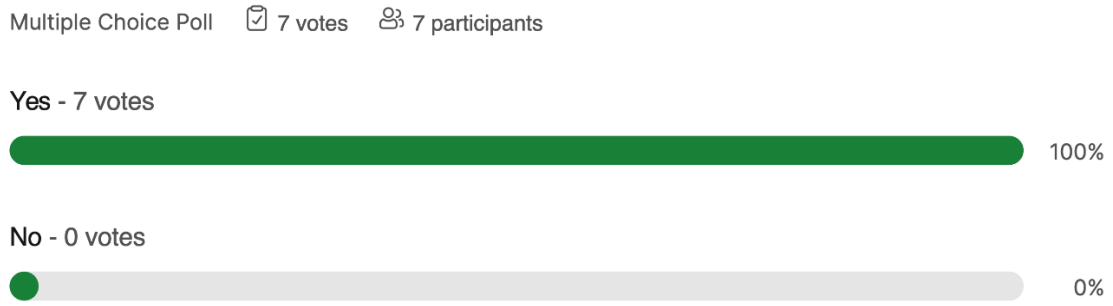


ARISE considerations from the finding for implementation guidelines: Subjects such as retrofit, embedded energy, sustainability and Innovative technologies were already directly covered and explicit in the QF. WP5 and WP6 pre-production of materials also took on board this suggestion, researching and initiated pre-production of training materials related to EPDs, LCA and use of Materials. Other subjects were related and embedded in overall context of the training.

A10.1.3 Qualification Set of Questions:

Question 5

Does this ARISE Framework Grouping a valid and applicable approach?



If NOT: Why? What would you propose as additional or different? NO replies

Question 6

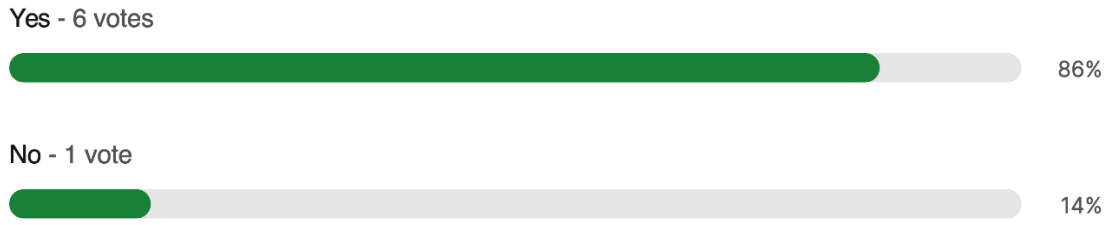
Do you see BIM BASICS as a specialism that should be underpinning all qualifications?

If NOT: WHY? And WHAT would you propose as additionally or differently?

NO replies

Question 7-

These are the BIM SUPPORT specialisms. Do you see these as a specialism that should be part of your technical support skillset?

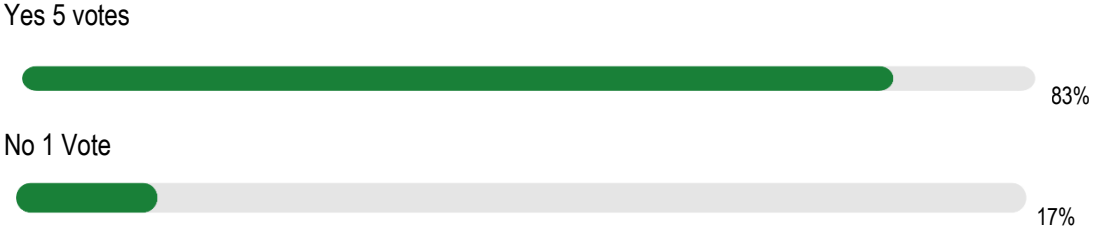


If NOT: WHY? And WHAT would you propose as additionally or differently?

NO replies

Question 8-

These are BIM UTILISATION specialisms. Do you see them as specialist skills applicable by several AEC professionals as part of your skillset?



If NOT: WHY? And WHAT would you propose as additional or differently?

Open text poll 1 response 1 participant

Anonymous
Planning for reuse

Question 9

These are BIM APPLICATION specialisms. Do you see them as expertise with associate skillsets applicable to specific AEC roles application?

Yes 4 votes

No 0 Votes

If NOT: WHY? And WHAT would you propose as additional or differently?

N/A

Question 10

The ENERGY EFFICIENCY specialisms. Can they set a category of skills applicable by several AEC professionals as part of your energy skillset?

If NOT: Why? And What would you propose as additionally or differently?

Findings and ARISE considerations from the Set of question relating to the QF for implementation guidelines:

In general, positive feedback in relation to the QF approach. Unclear why the not preferable reply in relation to EE specialism as participant didn't supply any indication nor justification. However, this is not one of the main groups, it is embedded in the overall Framework and the four main groups. What ARISE were suggesting was for ease of navigation and identification by users, to have all possible modules also collect into an extra Specialism. So, despite not so positive

response as obtain by the other groups, we do not see this comment as causing issues to the ARISE QF approach.

QUESTIONS ABOUT MATERIALS, SUBJECTS AND METHODS OF LEARNING AND ASSESSMENT

Question(s) 11- What are your favourite(s)

Materials for learning and assessment	count	total	results
Problem/project-base learning	7	10	70%
Guided-Self Study	1	10	10%
Active Learning	2	10	20%
Distance learning/Online learning/E-learning	1	10	10%
Collaborative/Cooperative Learning	4	10	40%
Multidisciplinary Learning	4	10	40%
Action Research	2	10	20%
Mastery learning	0	10	0%
Design for disassembly	2	10	20%
Scaffolding Learning	0	10	0%
The Flipped Classroom	0	10	0%
Case Studies	5	9	56%
Videos	5	9	56%
Existing literature	1	9	11%
Scaffolding learning	1	9	11%
Problem Solving	5	9	56%
Material Subjects (inc.in Learning Outcomes)	**count**	**total**	**results**
Management/Standards	1	9	11%
Interdisciplinary Knowledge/Teamwork/BIM Roles	3	9	33%
Information/Flow Communication	2	9	22%
Technical/Software Skills	2	9	22%
Interoperability	2	9	22%
BIM & Sustainability Modules	5	9	56%

ARISE considerations from the Set of question relating Learning and assessment: Cases studies, videos, and problems solving (practical) seemed to be the preferred options. WP6 and WP5 took that under consideration while revising production of materials. In terms of subjects, coordination between professionals has a preferred, other subject in general same ratings. WP5 and WP6 took on board and included benefits for coordination in materials. Modules on BIM and sustainability were focused in the package of materials produced. Standards as subject had less interest, but as they underpin BIM methodology and collaboration WP6 and WP5 decided to still include the subject in trials and materials.

delivery tools for learning and assessment	count	total	results
Web-based tutorials	6	9	67%
Instructor-led tutoring	1	9	11%
Online	3	9	33%
Narrative Videos	3	9	33%
Review of Existing Literature	1	9	11%
Informal learning	0	9	0%
Modules	1	9	11%
Workshop	3	9	33%
Group Activities	1	9	11%
Integrated Construction Studio	1	9	11%

ARISE considerations delivery tools: In general, online, we based tutorials and Narrative videos were the preference, which is in-line with improvements on materials made by WP5 and WP6.

Assessment Methods	count	total	results
Quizzes	4	7	57%
Exam	2	7	29%
Learning Outcome Based Assessments	2	7	29%
Continuous Assessment	4	7	57%

Status Reporting	0	7	0%
Group Work	1	7	14%
Problem Solving	1	7	14%
Peer Evaluation	1	7	14%
Model Based Assessments	0	7	0%
Presentation	2	7	29%
Homework/Assignments	2	7	29%

ARISE considerations Assessment: In general, aligned with the work that was carried out by WP5 and WP6 and assessment set.

Overall conclusion from survey:

WP6 collected and analysed the results, then presented and discussed with WP5 to coordination of efforts.

In relation to QF in general validated ARISE proposal, so nothing of note to suggest changing to WP3.

In terms of learning, materials and assessment, the survey was taken in consideration, together with others to help informed and guide reviews. It was in alignment with work that was carried out by WP6 and WP5, including choices and priorities, validating our decisions. Some consideration that WP6 and WP5 tried to balance, were due to the possible difficult alignment between the preference for delivery tools not being the most easily align with some of the indicated preferable methodology and assessment. For example: Problem solving and project-based delivery, can be difficult to teach without some instructor lead assistance or to ensure suitability with a Questionnaire led assessment to ensure validity of achievement.

A10.2 Two Buildup internation online workshops (Online)

10.2.1 Trainees

Was held in January 2024 with 40 participants. The Platform and ARISE QF were presented. A link with supporting instructions to access the ARISE platform was

shared, with access to the trials provided to participants. This also included the link to the Skills gap survey.

A10.2.1.1 Participation & Results

We had a total of 22 responses.

Profiling:

Nationality & Residence Regions

Country	Participants	Percentage
Italy	8	33.3%
Portugal	7	29.2%
Ireland	5	20.8%
Sweden	1	4.2%
UK	1	4.2%

Type of company

Participants were employed in both private and public companies, with following breakdown:

- Local Authorities account for approximately 34.6% of all responses.
- Architects, Universities, Training Centres, and Private Companies (10 to 49 employees) each make up around 11.5%.
- Private Companies (250+ employees) and NGOs are the smallest categories, each with 3.8% of the total.

Feedback

In the session and during Q&A after presentation of the QF, general perception was of agreement and interest. Unfortunately, that dint translate in participation on the survey that ARISE had circulated during the event.

A10.2.2 Trainers

Was held in February 2024. The Platform and ARISE QF were presented. There was a slide general interactive, and the Participant were imported to the QF feedback form. Despite positive in session comment during Q&A interaction with ARISE teams, we obtained no official participation in the Survey feedback form.

A10.2.2.1 Participation & Results

We had a total of 12 participants.

Profiling:

Country	Participants	Percentage
Italy	2	17%
Portugal	1	8.3%
Spain	1	8.3%
Belgium	3	25 %
Netherlands	1	8,3%
Undisclosed	4	33. 1%

Type of company

Participants were employed in both private and public companies, with following breakdown:

- Private Company (250+ employees): 1 out of 12 (8.33%)
- EU Institution: 1 out of 12 (8.33%)
- University: 2 out of 12 (16.67%)
- Private Company (50 to 249 employees): 2 out of 12 (16.67%)
- Private Company (1 to 9 employees): 3 out of 12 (25%)
- Architect; Private Company (50 to 249 employees): 1 out of 12 (8.33%)
- Private Company (10 to 49 employees): 1 out of 12 (8.33%)
- Other: 1 out of 12 (8.33%)

Feedback

In the session and during Q&A after presentation of the QF, general perception was of agreement and interest. Unfortunately, that dint translate in participation on the survey that ARISE had circulated during the event.

A10.3 OA online workshop-Digital tools for Energy efficiency

Was an upskilling and recruiting online event held with the OA (Portugal) In July 2023, we took part of their ongoing CPD type series called “Technical Tuesdays” (Terças Técnicas). Embedded into the upskilling digital “lesson” was also a presentation on the ARISE QF and request for feedback in a “SLIDO” Interactive Quiz format:

Date: 13th July 2023,

Venue: N/A

Organised and conducted on behalf of WP6 by: BMC & ACE, organised by OA.

Type of event: online

Number of attendees: 10

Number of responses: 2

Objective: To present, to the national construction sector (architects) , the ARISE Learning frameworks, method of delivery and platform and to collect feedback that will be used for the final revision of WP6 reports D6.1 and D6.2. Also to deliver an upskilling workshop on digital tools for energy efficiency

A10.3.1 Response and findings

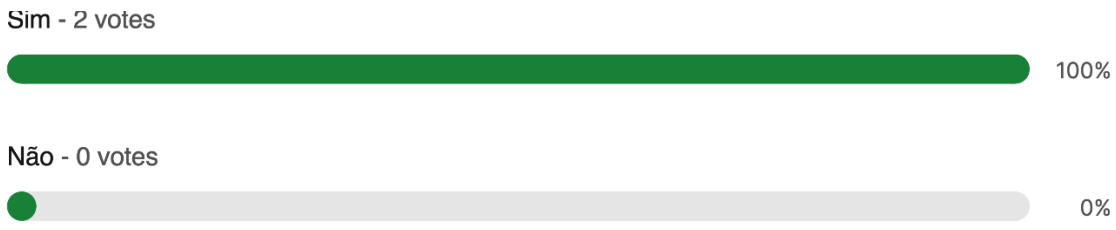
A10.3.1.1 Profiling

User didn't supply enough info. For GDPR reason OA could not disclose either

A10.3.1.2 QF related Questions

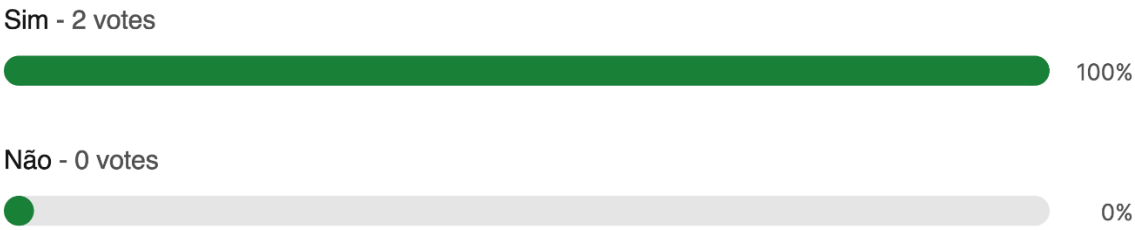
QUESTION 1

Do you agree with the Framework Grouping as a possible- valid and viable- approach? (2 replies)



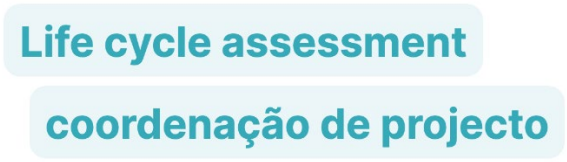
QUESTION 2, 3 4 & 5 (combined)

Do you consider the Specialism related to BIM BASICS, BIM Support, Bim UTILISATION and BIM Application, as a Specialism that can serves as the initial foundational knowledge for all Qualifications and should be part of your basic skillset? (2 replies)



QUESTION 6

What other topics (besides Energy Efficiency) do you think should/could be added to the Curriculum Framework? (2 replies)

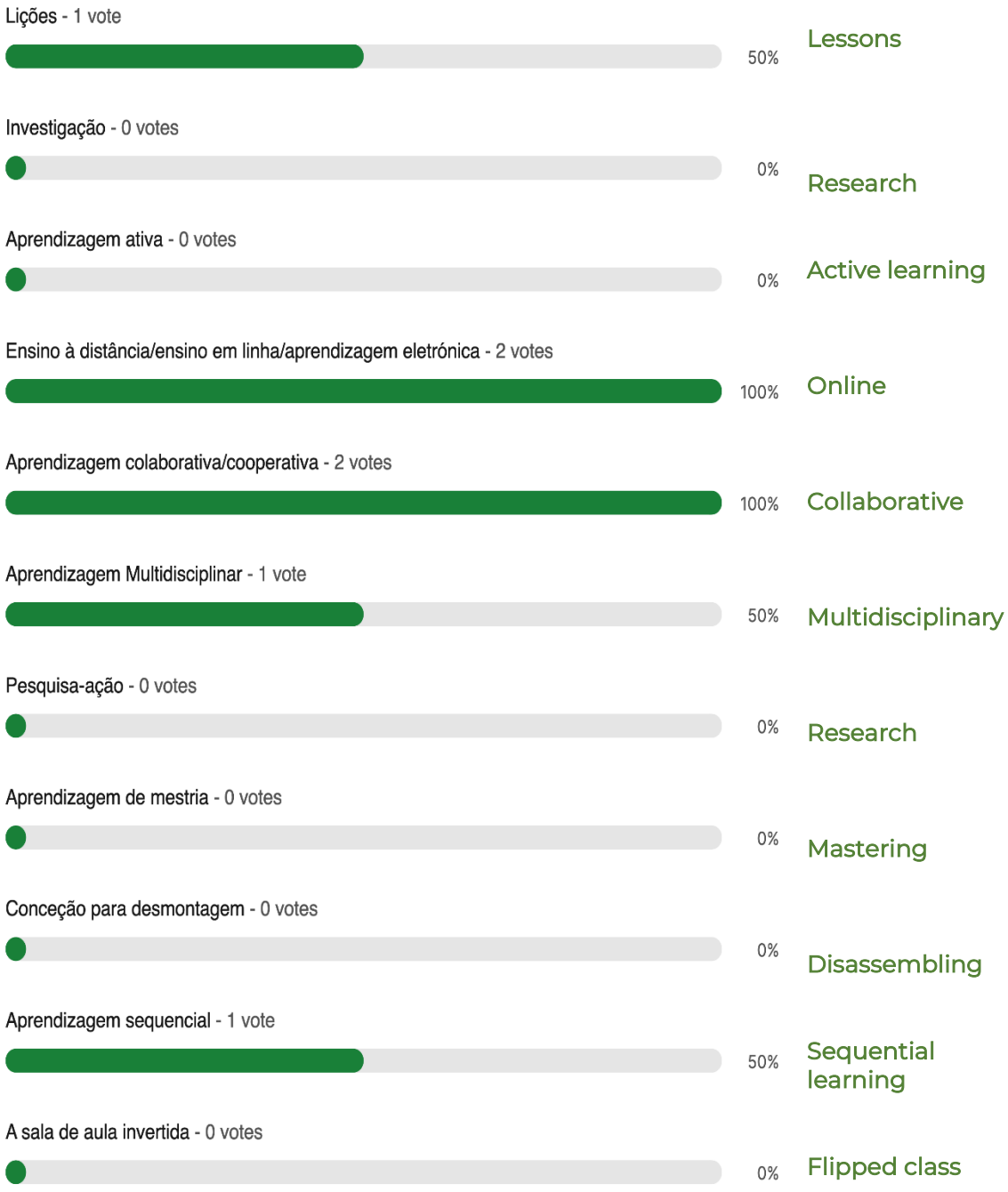


Lifecycle and Project Coordination

Learning related questions

QUESTION 7

Which are your preferred learning Methods?



QUESTION 8

Which are your preferred learning Materials

Options	count	total	%
• Case studies	4	4	100%
• Videos	2	4	50%

• Existing literature	1	4	25%
• Learning outcomes	1	4	25%
• Management/Standards	0	4	0%
• Problem-solving	1	4	25%
• Information/Communication flow	0	4	0%
• Technical and software skills	2	4	50%
• Interdisciplinary knowledge/Teams/BIM-related roles	3	4	75%
• Interoperability	0	4	0%

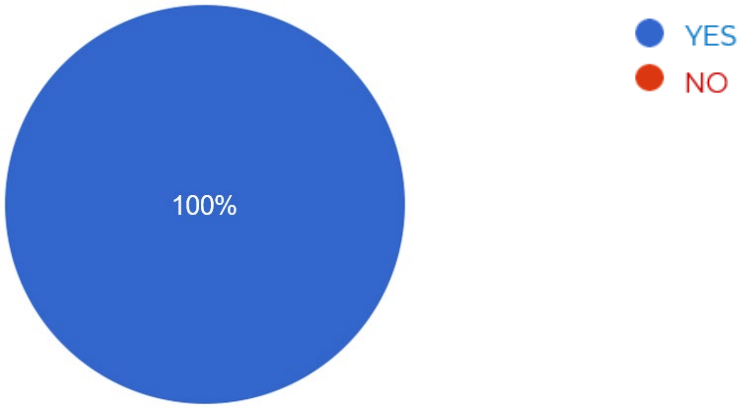
QUESTION 9

Which are your preferred Assessment methods

Options	count	total	%
• Tests	1	4	25%
• Exams	0	4	0%
• Assessments based on learning outcomes	2	4	50%
• Continuous assessment	2	4	50%
• Status reports	0	4	0%
• Group work	1	4	25%
• Problem-solving	3	4	75%
• Surveys	0	4	0%
• • Peer assessment	0	4	0%
• • Model-based assessments	1	4	25%
• • Presentation	0	4	0%
• • Homework/assignments	2	4	50%

QUESTION 10

Since COVID19, online education has become common. Are the methodology and resources proposed by ARISE sufficient, in the context of professional training, to motivate students with a 24/7 access?



A10.3.2 Overall Finding and suggested actions/ considerations for ARISE improvement.

Event didn't have the expected attendance. From the attendees, only 2 were willing to interact with SLIDO in real time and provide feedback. Attendees were directed to survey forms via link, to further contribute post event. But no further replies were able to be collected.

Replies are positive, but due to the number of responders, they were not considered a valid sample, at least until a larger number of responses could be collected. After more widespread survey, comparison with the 2 replies was done and they are are in-line with overall findings from the other surveys. Information obtain was still considered by WP6 and WP5 when developing Trials.

A10.4 International & Regional Conferences

During projects duration, ARISE consortium partners participated in different conferences and events (for details refer to WP8 reports), including the yearly versions of the BIM Coordination Summit in Dublin, were they presented the ARISE project, and when possible requested participation and feedback again. Attendees' willingness to participate in surveys was low.

The most recent attempt, towards the end of the project to collect updated final feedback, including on the qualification Framework, during the Digital Construction conference in Belfast, early October 2024. With 200 registered participants, we presented Arise, the Qualification Framework on stage to the participants, and requested feedback with links and QR codes to the surveys.

Resulted in no direct recorded participation in the surveys, but again, several attendees addressed the WP6 representatives in the ARISE allocated stand and with positive comments and overall approval of what they had been presented with.

A10.5 Additional regional workshop feedback sessions

A10.5.1. Survey- Qualification Recognition Scheme (Framework)-NI

BMC help some sessions with the testing cohort with which it would be piloting some materials. After presentation about ARISE QF and positive informal feedback from participants regarding Grouping and Specialism. A quantitative and qualitative survey was given to participant of the early inception of Preproduction Trial sampling conducted by BMC to UK cohorts. This survey attempted to collect data to:

- Record type of stakeholder, and region ARISE was attracting.
- provide information regarding skills gaps based on skills maturity.
- Validate overall concept of the ARISE QF competencies. And indicate areas for improvement guided by market needs

A10.5.1.1 Participation & Results

From a wider number involved in those testing cohorts only 9 were willing to provide responses.

A10.5.1.2 Profiling:

Gender

- Male (6)
- Female (3)

Nationality & Residence Regions

- British (8)
- Irish (1)

All residing in the UK

Education Level and Fields and Areas of study

The majority had a higher education level

User's field areas were linked to:

- A-levels BSc Architecture
- Level 2 City & Guilds - 2D CAD DEGREE Interior Architectural Design Advanced BTEC GNVQ in Art & Design GCSE - Mathematics, English, Double Award Science, Art & PE
- GNVQ Advanced Construction & the Built Environment HND Construction & the Built Environment
- 4Degree in Architectural Technology & Management Chartered Member of Institute Architectural Technology
- BTEC Mechanical Engineering
- GCSE's ONC / HNC CIVIL ENGINEERING AUCTOCAD TEKLA / STRUCAD
- BSC Degree
- PgCert (Professional Practice in Architecture), MArch (Master of Architecture), BSc (Bachelor of Science, Architecture)

Roles

- Architectural Assistant
- Cad Technician/Interior Designer
- Senior Architectural Technician
- Architectural Technician
- Manager
- Design Team
- Senior Draughtsman / Steel Detailer
- Digital Construction Lead
- Architect

All employed, in SMEs in design practices and also one participant in the contractors/ installers.

A10.5.1.3 Skills Gap assessment profiling

Based closely on the 5 maturity levels, users answered the following:

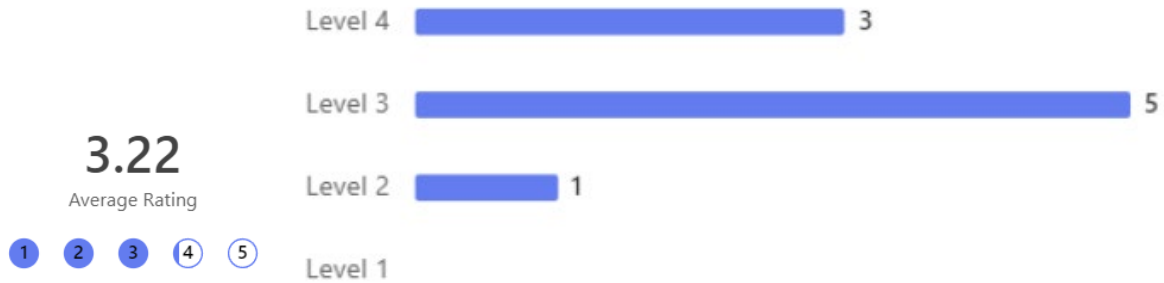
Skill level definitions		
1		Has **little knowledge and skills** with respect to the relevant field / technology
2		**Understands basic knowledge** and has practical skills within the field, is able to solve problems by selecting and applying basic methods, tools, materials and information
3		Has **comprehensive, factual and theoretical knowledge**, is capable of solving problems within the field
4		Has **advanced knowledge involving** a critical understanding of theories and principles and skills, required to solve complex and unpredictable problems in the field and is aware of the boundaries
5		Has **specialised knowledge and problem-solving skills**, partly at the forefront of knowledge in the field, in order to develop new knowledge and procedures and to integrate knowledge from different fields

Fig12: Maturity Skills

Note : some users had already started the ARISE trial training when answering this survey, so their skills base may have already increased.

QUESTION 1

From 1 to 5, please classify: how far are you in your digitalisation route?



QUESTION 2:

What Digital Tools and methods do you currently use in your work?

Digital tools
CAD, CDE, exchange of information,
AutoCAD, Revit, Navisworks
AutoCAD -
Autodesk Revit 2023 Microsoft 365 Package
Solid edge, Tekla viewing software, Autocad, Revit, CDE
Collaborating Models And Issuing To Cloud Format.

Excel And Word Documents
Inventor / Revit and a CDE.
AutoCAD, SketchUp
Autodesk software, cloud storage, exchange of information,
AutoCAD, Revit, Navisworks
AutoCAD

Table – Survey results in skills assessment- digital tools

Findings: Some still in 2D processes (BIM maturity level 0 or 1) showed the trend of the industry with UK users to apply BIM with some in more advance workflows than others. Mainly because of The BIM mandate of 2016 the responders to the feedback had already initiated their digitalisation route, but were interested in deepening knowledge, ensure good practices and possible obtain recognition of prior skills. Other participants of the cohorts were more novice; however majority did not reply to survey.

A10.5.1.4 Framework Improvement Questions

QUESTION 3:

What skills would you find useful to include in ARISE FRAMEWORK to be and considered for training and implementation? Why?

response	WP6 Comment / recommendation
Basics of Revit	Already part of QF (BIM authoring in general- not software specific) Trials covered scheduling
Construction experience, design flair	No relevant comment
Meta Data within Revit_ shared parameters, Cobie data, program-based parameters and how to automate these into schedules. (5D)	Already part of QF Trials covered scheduling
n/a	
Use MS products regarding digital information. excel, word, emails . CAD knowledge to allow 2d	No relevant comment

and 3d visualisation understanding. collaboration between understanding RFI and how to gather information to update current working models. being able to understand materials used in projects and methodology	
Knowledge and understanding in the sustainable energy	Already part of QF and covered in Trials (BIM tools for energy and also in energy terms)
BIM Model Focusing on Energy	
Going from BIM maturity level 1 - level 2. and a proposed route map for your company to do this CDE Training,	Already part of QF Covered in Bim maturity Stages. And Bim requirement And CDE module
Topics regarding conservation (digital tools currently lacking with existing structures	Retrofit studies considered in material
Basics of Revit	Covered

Table – Survey results additional skills suggestion

Findings: In general, most of the suggestions are part and can be integrated into the QF Groups, their Specialisms, and including either explicitly or implicitly in the ULOs. The comments were under review and consideration when planning iterations of pre-production and production of Trials, and for consideration of possible expansion of Trial module programme and or exploitation phase.

QUESTION 4:

What skills digital and construction you already have, that would like to be "formally recognised" in your ARISE user profile?

Findings response was mostly naming software, such as AutoCAD, Revit, Tekla, Possible route for ARISE exploitation could be to become a certified training entities for some of the software manufactures too. Some of the Trial training will cover specific software, so it will help in recognition of Bim modelling skills with specific software, but this was not ARISE main focus.

Other more in-line with ARISE were skills such as:

- renaming of models and drawings to issue to BIM format
- creating IFC
- export from BIM to 2D drawings ,
- project management.
- CDE

These are covered in the QF and addressed in Trails sampling.

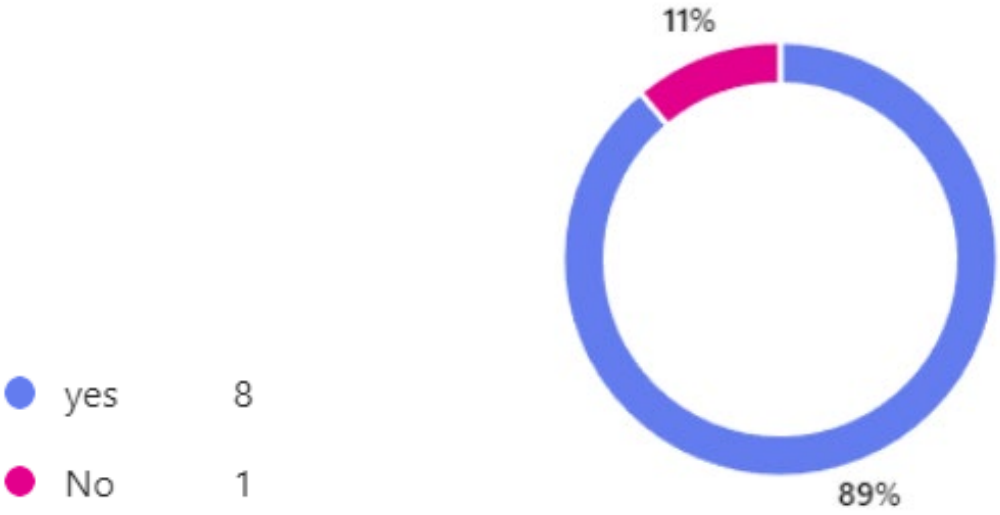
QUESTION 5:

What other digital construction skills do you require? (9 responses)

response	WP6 Comment / recommendation
More in-depth knowledge of the BIM process	Covered in QF Covered in Trials
To become more competent in all aspects of the BIM process and software to use it to its full capacity	Covered in QF Covered in Trials
Navisworks	Covered in QF Covered in Trials
n/a	
Basic BIM Training new team members	Covered in QF Covered in Trials BIM Basics Specialism
More knowledge on MS products	N/A
background in engineering even basic BIM process from tender to handover	Covered in the QF Covered in trails Approaches in BIM tools fro EE And Information Management Module
Interoperability training would be very useful	IFC module
More in-depth knowledge of the BIM process	Covered in several modules- Bim Basics

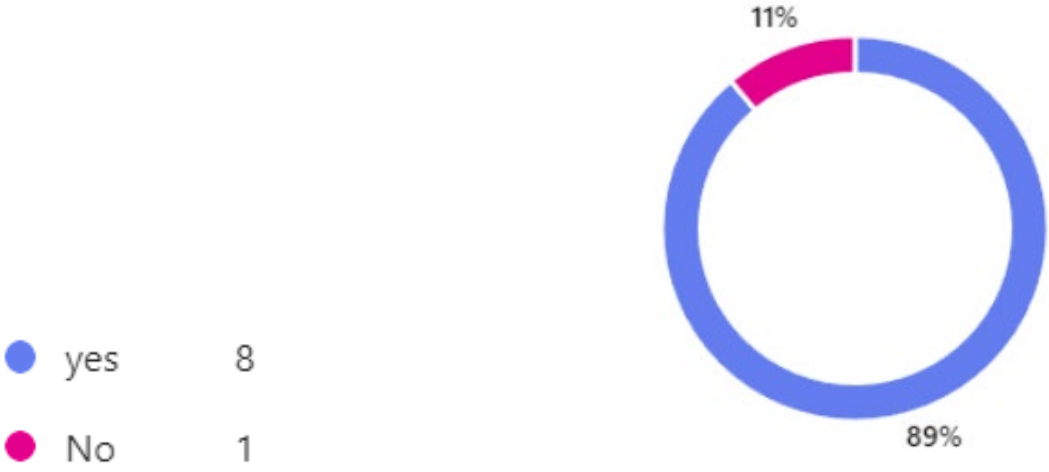
QUESTION 6

Do you see the benefit of participating in ARISE upskilling to gain new skills and/or allow recognition of current or experience, increasing your employability as well as efficiency? (9 responses)



QUESTION 7

Do you see the benefit of upskilling based on the ARISE Framework for construction professionals and stakeholders to gain valuable new digital energy efficiency enabling skills, and/or allow recognition of current or experience, increasing your employability /job mobility?



A10.5.1.5 Current and future usage and application of ARISE in construction projects and EE

QUESTION 8

Would you be willing to you time and effort in assessment processes, to obtain accreditations with ARISE? (9 responses)

- Yes. (8 participants)
- One indicating that : *"Depends on the topics and if they are relevant / useful within my work"*

QUESTION 8a

If so (previous question), how much (in hours per week)? (9 responses)

- 2 hours
- 3 Hours per week, due to the full time job.(2 participants)
- 4 hours (4 participants)
- 4-5 hours per week "I *would like to follow BIM methods in more and more projects. You'll learn more and more as you use it full time*."
- 4-6 hours per week

QUESTION 9

What size and type of project do you work on? Presently what are the strategies for energy efficiency? Is it supported by digital tools and methods?

ID	Nr of projects p/year	size	type
1	30	Undisclosed	Medium Scale To Large Scale Commercial And Community Conservation Projects
2	8	Undisclosed	Residential Renovations, Commercial Office Spaces And Large Enterprises
3	Undisclosed	10m²	Commercial Fit-Out
4	5-6 Per Year	£1 Million	Conservation - Existing Buildings. Mainly In Restoring Original Fabric Of Buildings, But Can Also Include Extensions.
5	20 Projects Per Year	£5million	New Buildings
6	10 Projects	5000 m²	Commercial New, Renovations

7	Undisclosed	100 Ton To 1000 Ton Jobs In Steel	New Build and Extensions
8	4-5 Projects Per Year.	Undisclosed	Joinery Fit Out
9	10 Per Year	Small To Large Projects	Conservation, Restoration, Extensions On Existing Buildings

These ranged from newbuilds, renovations/Retrofit. Do to undisclosed data, hard to estimate size in m^2 of projects.

ID	size and type of project working on	presently what are the strategies for energy efficiency?	Is it supported by digital tools and methods?
1	Medium to large scale community, commercial, and educational.		Revit for some projects
2	Residential project	meeting Building control Standards only require through more training and using technology available to improve designs around energy efficiency	NO
3	Commercial fitouts 1000m^2 (£1.5m - £75m)	Unsure of energy efficiency strategies	N/A
4	Mainly conservation projects. Restoring and upgrading existing (mainly listed) buildings	.Energy efficiency mainly derived from building control standards. Just taking these requirements and researching technology, materials and methods to find adequate solution.	NO.
5	Commercial	rainwater harvesting	NO
6	500m^2 5 project sper year	Not using strategies at present	YES

7	150 m² 1000-2000 t on steel jobs	unsure	drawings in digital format from engineer and architect
8	re fit of an old building.	I am not sure on the energy efficiency,	NO
9	A range of project sizes	No	NO

Findings of questions

Majority just following Building Control Standards. As the UK moves to an Nzeb standard then the Market will be transitioning to NZeb

Despite the initial indication of medium level of digitalisation, according to these answers, digital tools aren't being used to support EE or sustainable energy strategies. ARISE upskilling has raised awareness of this usage and started these participants on that journey.

A10.5.1.6 Overall Conclusion from the survey findings.

Overall, survey offered insight on current skills gaps, and requirements of users. Such data was analysed and used to inform WP5 and WP6 on modules and materials to include in Trials. It also tested the acceptance of the ARISE QF by users and offered them the opportunity to directly suggest improvements and additions. Most of the suggestions were subjects that are or can be considered encapsulated already within the QF scope. In general, users have validated the ARISE proposed QF. UK selected cohort participants were advised to enrol on the ARIS platform and supplied links to the extended surveys for further data gathering.

A10.5.2 Ireland

TUD was able to organise a session with a cohort of professional from Ireland, to assist WP6 on the 12.02.24. WP6 lead the online session.

The objective was to collect further feedback in relation to ARISE Framework and stimulate participants to enrol in ARISE platform and Trials, and engage in the sample upskilling programme.

A10.5.2.1 Profiling:

Gender

- Male 14
- Female 11
- Other 2

Nationality & Residence Region

Nationality	Regions
Irish 4	Ireland (all)
British 2	
Polish 3	
Indian 1	
Nigerian 1	
Italian 2	

Table -. Survey responders Profiling by region and Nationality.

Education Level

The majority had a higher education level (Degree/ Master's Degree) and the audience was primarily linked to Architecture.

Original Educational Field	
Architectural Technologist	1
Part 3 Architect	1
Mechanical Engineer	1
Bachelor of Science Honours BIM (digital construction)	1
Master of Architecture	5
-member of Italian Architects Association	1
Architecture and Urbanism	
Bachelor's degree in civil engineering	1

Msc project management	1
BSc in Quantity Surveying	1

Table. Survey responders Profiling by education.

Role

Role	
BIM Engineer	1
Kitchen Designer / Interior Designer	1
Architect	6
Architect - BIM Coordinator	1
Student	1
Quality coordinator	1
Quantity Surveyor	1
BIM Engineer	1

Table . Survey responders Profiling by Role

Employment and Type of company

Employed in SMEs or large enterprises#, for example:

- engineering services company in Ireland (large enterprise)
- Architecture + Urbanism companies practices as SMEs.
- construction firms- large enterprise

ARISE, based on the figures, estimated an average of around 48000 m^2.

A10.5.2.2 Skills Gap assessment profiling

Based closely on the 5 maturity levels, users answered the following:

Skill level definitions		
1		Has **little knowledge and skills** with respect to the relevant field / technology
2		**Understands basic knowledge** and has practical skills within the field, is able to solve problems by selecting and applying basic methods, tools, materials and information
3		Has **comprehensive, factual and theoretical knowledge**, is capable of solving problems within the field
4		Has **advanced knowledge involving** a critical understanding of theories and principles and skills, required to solve complex and unpredictable problems in the field and is aware of the boundaries
5		Has **specialised knowledge and problem-solving skills**, partly at the forefront of knowledge in the field, in order to develop new knowledge and procedures and to integrate knowledge from different fields

Fig: Maturity Skills

QUESTION 1

From 1 to 5, please classify: how far are you in your digitalisation route?

QUESTION 2

What Digital Tools and methods do you currently use in your work?

- Revit, Navisworks, BIM360 and ACC
- Revit , ACC
- Revit, Dynamo
- Revit, AutoCAD, adobe suite
- Cad, Photoshop, Team, CDE (Procore), Arctechpro
- Revit and Lumion. Sometimes Twinmotion
- Revit (5)
- Navis, BIM 360, Notion, Dynamo
- Estimation Software (Cubit). Will be using Cost X soon

QUESTION 3

What skills would you find useful to include in ARISE FRAMEWORK to be and considered for training and implementation? Why? (13 response)

Summary of responses	WP6 comments/ considerations
Energy performance of buildings	Encompassed in QF concept
Sustainability	
Coding	
Energy efficiency analysis skills	
Estimation software	
Easily understood definition of BIM concepts eg Digital Twins	Encompassed in QF Included in Trials
BIM & Sustainability	
Collaboration and Communication, Interdisciplinary Knowledge.	
Studies cases	Considered and researched

QUESTION 4

What skills digital and construction you already have, that would like to be " formally recognised" in your ARISE user profile?

Summary of responses	WP6 comments/ considerations
Software such as AutoCAD, Revit, ACC, Navisworks	Applicable as part of BIM application and approached in the BIM Utilisation Specialisms too. Trials used Revit and Navisworks as sampled examples
Mechanical background with pipe design and HVAC design, would be advantage have design courses live HVAC or structural as part of the options	Can be applicable and integrated as part of BIM application and approached in the BIM Utilisation Specialisms too.
Detailing	Part of the QF (for example BIM Modelling)
Use the Point cloud and drone images of the project to work in the As-built	Was under consideration. applicable to the QF Digital construction module refers to drones and digital surveying
BIM Fundamentals	Covered in ARISE QF Covered in Trials
Data management	
Not sure	N/A

QUESTION 5

What other digital construction skills do you require?

Summary of responses	WP6 comments/ considerations
Project management	Part of the QF. modules in Trials covered subject
Design skills.	Overall skill, holistic approach
Cobie, in deep Autodesk Construction Could	Part of the QF. modules in Trials covered subject
3D, rendering, AR/VR	Part of the QF Was under consideration
BIM collaboration	Part of the QF
New technologies, Energy.	Part of the QF
Navisworks	Part of the QF. Covered in trials
Mainly BIM	Part of the QF .Covered in trials
Revit	Part of the QF. Covered in trials
Overview of BIM benefits	Part of the QF. Covered in trials

QUESTION 6

Would you commit time and effort to assessment processes, to obtain accreditations with ARISE?

- Yes (10)
- Maybe (2)
- Potentially (1)

A10.5.2.3 Potential Impact

QUESTION 7

What size and type of project do you work on? What are presently the strategies for energy efficiency? Is it supported by digital tools and methods?

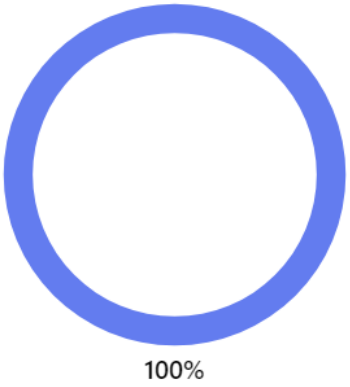
size	type of project and the strategies for energy efficiency?	supported by digital tools and methods?
10 projects €15 million (5350m²)	Residential, commercial, master-planning	NO
4-5 per year 1000m²	Commercial Fitout projects and industrial design	NO
4 per year	mixed	Unsure. work for a data centres projects but just in the coordination side
NA	Residential / mixed use	N?A
2 per year	Residential, healthcare	YES
5 per year 1 to €20million	Residential, healthcare, education	undisclosed

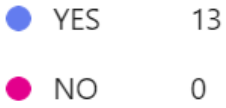
(8000m²)		
5-6 per year 2-10 million Euro. (4000m²)	Social Housing Schemes, Community Centres Refurbishment mainly timber frame construction A2 or A3 rated.	Currently NOT using BIM
10 per year	Residential, renovations, schools	undisclosed
2-3 per year	mixed use, fit-out etc	
5 per year Industrial size	Residential, Industrial, Data Centre. a entire department is on charge of that, so I don {t have any idea.	YES
4 per year	Residential. I am not involved in energy strategies	undisclosed
3 per year	Residential. Not aware of the strategies	NO
30 million Euro. (10700m²)	Pharmaceuticals, Community Nursing Units (CNUs)	undisclosed

A10.5.2.4 Framework Questions

QUESTION 8

Do you agree with the Framework Grouping as a possible- valid and viable-approach? (13 responses)





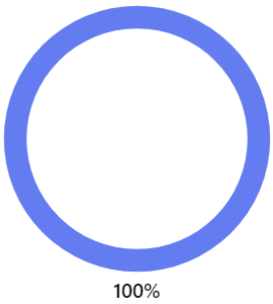
QUESTION 8a

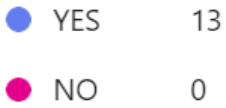
If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

N/A (13 responses)

QUESTION 9

Do you consider BIM BASICS as a Specialism that can serves as the initial foundational knowledge for all Qualifications and should be part of your basic skillset? (13 responses)





QUESTION 9a

If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

- - N/A (11 responses)
- Because we are moving forward most of the projects being BIM
- Agreed

QUESTION 10

These are the BIM SUPPORT Specialisms. Do you agree that these can be the Specialism and Qualifications regarding technical support related to BIM? (13 responses)

QUESTION 10a

If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

N/A (13 responses)

QUESTION 11

These are the BIM UTILISATION Specialisms. Do you agree that these can be the Specialism and Qualifications regarding technical support related to BIM? (13 responses)

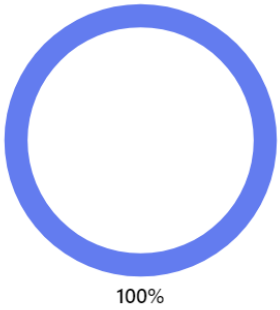
QUESTION 11a

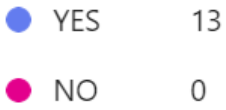
If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

N/A (13 responses)

QUESTION 12

These are the BIM APPLICATION Specialisms. Do you agree that these can be the Specialism and Qualifications regarding technical support related to BIM? (13 responses)





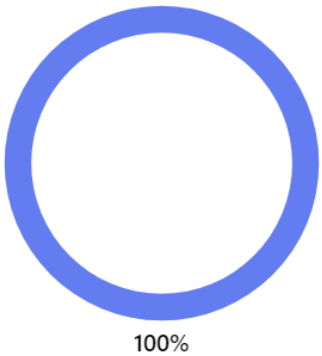
QUESTION 12a

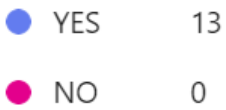
If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

N/A (13 responses)

QUESTION 13

Do you agree that the ENERGY EFFICIENCY Specialisms form a series of skills that can be applicable and useful to various AEC professionals, as part of their skillset in this field? (13 responses)





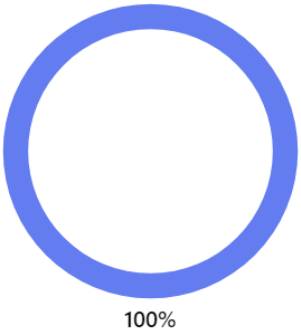
QUESTION 13a

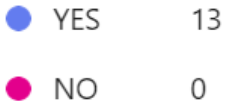
If you answered NO, WHY? And would propose anything else differently or additionally? IF you Answered YES you can justify or simply answer N/A.

N/A (13 responses)]

QUESTION 14

Can you see the merits / benefits of adopting a TASK and SUB TASK BASED APPROACH?





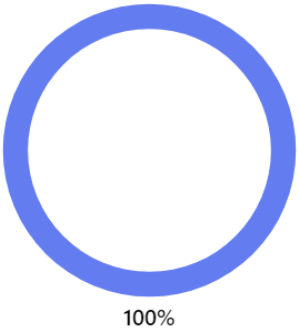
QUESTION 14a

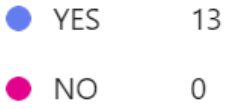
If NOT: Why? And what would you suggest improving?

N/A (13 responses)

QUESTION 15

Do you agree with these BIM Coordination specialism tasks, subtask, and ULO examples?





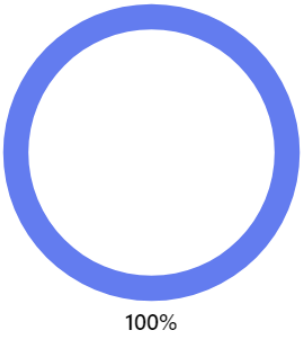
QUESTION 15a

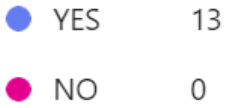
If NOT: Why? And what would you suggest improving?

- N/A (12 responses)
- Looking at the sample, it is a bit tedious. I wish there are codes that can be used.

QUESTION 16

Do you agree with these EE specialism tasks, subtask, and ULO examples?





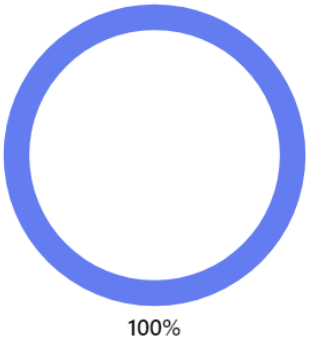
QUESTION 16a

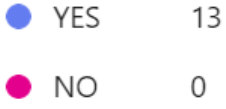
If NOT: Why? And what would you suggest improving?

- N/A (12 responses)
- Looking at the sample, it is a bit tedious. I wish there are codes that can be used.

QUESTION 17

Do you agree that a Framework format of specialisms- tasks, subtask based- with associated ULOs approach is valid and applicability to learning?





QUESTION 17a

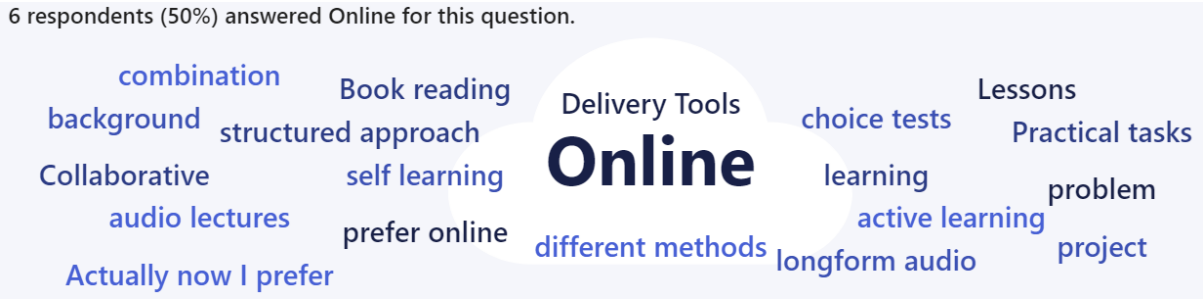
If NOT: Why? And what would you suggest improving?

- N/A (13 responses)

A10.5.2.5 Learning Methods, tools & assessment Questions.

QUESTION 18

Which are your preferred learning and assessment Methods? (13 responses)



- Online assessment, project based.
- Project based (3)
- where we have a brief and a real case (1)
- No preference
- Multiple choice questions, practical tasks
- Online, Applications, tools
- Group Work
- Model based assessments, homework, tests
- online tests
- Assignment

QUESTION 19

Since COVID19, online education has become common. Are the methodology and resources proposed by ARISE sufficient, in the context of professional training, to motivate students with a 24/7 access? Do you suggest anything additional resources/ features? (13 responses)

- Yes (2)
- No (3)
- They're sufficient.

- No, outside of a couple of learning plans I don't see a matrix of modules that shows you how to progress.
- N/A
- Is perfect.
- Coursebooks. online resources
- Resources provided for online education by ARISE are sufficient.

A10.5.2.5 Finding of Survey

Most were already in the digitalisation path, but not all applying in their work. There was potential to influence current and future work with ARISE skills. The suggested skills/subjects by participants are already encompassed in the QF. Participant were positive in relation to QF approach, with preference to project-based learning. In general participant agreed with the QF, with WP6 considering that this cohort validate the QF. Further surveys were done with other actions to increase sample and confirm results. In relation to stimulus to counter the Covid online fatigue, is what participants indicated ARISE may have needed to improve. However, participants had not experienced the gamification of the platform. Event presentation and survey focused on QF validation.

A10.5.3 North Macedonia

IECE was able to organise a session with market stakeholders, to assist WP6.

Workshop: ARISE Framework– A Roadmap to Industry Training- Industry Input Session (North Macedonia)

Date: 6th December 2023,

Venue: Skopje, North Macedonia

Organised and conducted on behalf of WP6 by: IECE North Macedonia

Type of event: Hybrid (physical and remote attendance)

Number of attendees: 32

Number of responses: 25

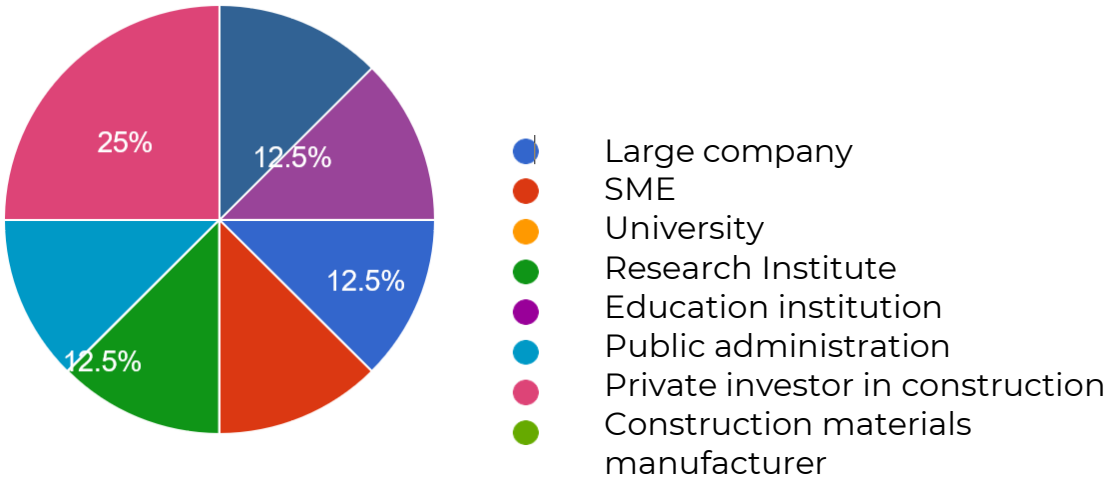
Objective: To present, to the national construction sector, the ARISE Learning frameworks, method of delivery and platform and to collect feedback that will be used for the final revision of WP6 reports D6.1 and D6.2

A10.5.3.1 Profiling

Job position

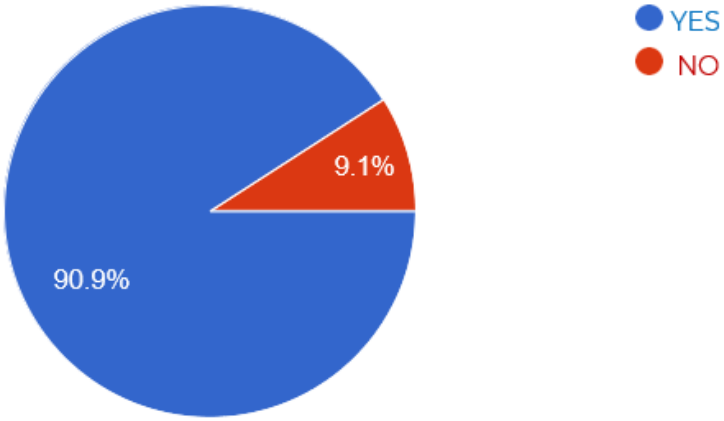
- Researcher
- Architect Designer
- Quality Control Engineer Quality Control Architect
- Head of procurement department in the municipality of Ohrid
- Head of supplies (private construction company)
- Factory manager
- Trainer
- Architect Designer
- Mechanical engineer designer
- Production manager
- Procurement officer
- Procurement officer
- Environmental inspector

Type of organization/ institution

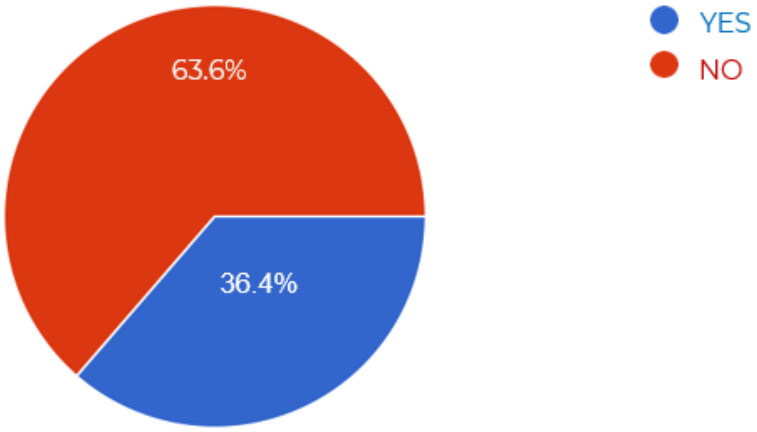


A10.5.3.2 QF related questions

QUESTION 1- Do you agree with the Framework Grouping as a possible- valid and viable- approach?



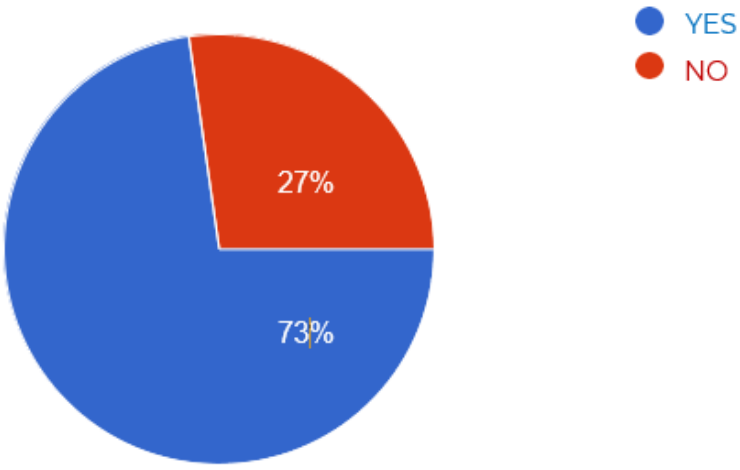
QUESTION 2-Are there other topics (besides Energy Efficiency) that do you think should/could be added to the Curriculum Framework?



QUESTION 2a- If you answered NO, WHY? And would propose anything else differently or additionally? (4 responses)

- *"All fields of specialisms included in the construction process should be encompassed by the QF"*
- *"Circular economy"*
- *"Materials life cycle"*
- *"Environmentally friendly construction products"*

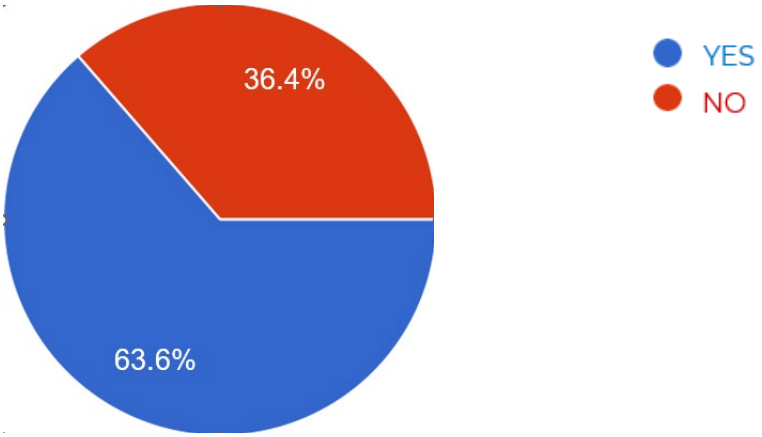
QUESTION 3-Do you consider BIM BASICS as a Specialism that can serves as the initial foundational knowledge for all Qualifications and should be part of your basic skillset?



QUESTION 3a-If you answered NO, WHY? And would you propose anything else differently or additionally? (1 responses)

- *"BIM Basics should have one initial level and advanced level different for various professions."*

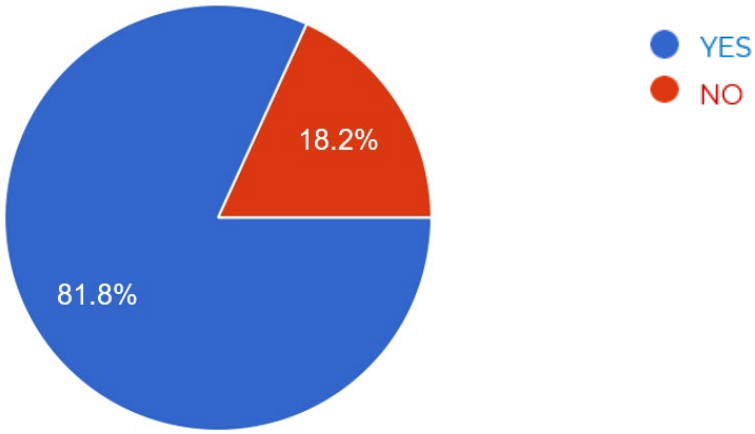
QUESTION 4-These are the BIM SUPPORT Specialisms (refer to the slide).
Do you agree that these can be the Specialism and Qualifications regarding technical support related to BIM?



QUESTION 4a If you answered NO, WHY? And would you propose anything else differently or additionally? (2 responses)

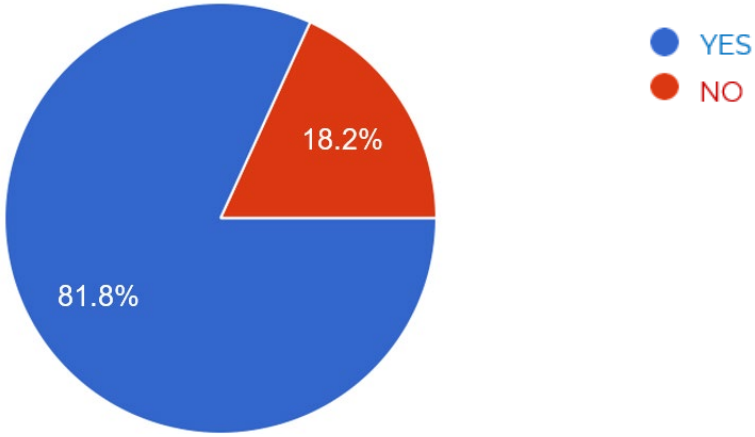
- *"These specialisms should be linked to other software and ICT skills "*
- *"The BIM Support is usually associated with tech support services in companies."*

QUESTION 5 -These are the BIM UTILISATION Specialisms. Do you agree that these can be specific skills, suitable and applicable to several AEC professionals?



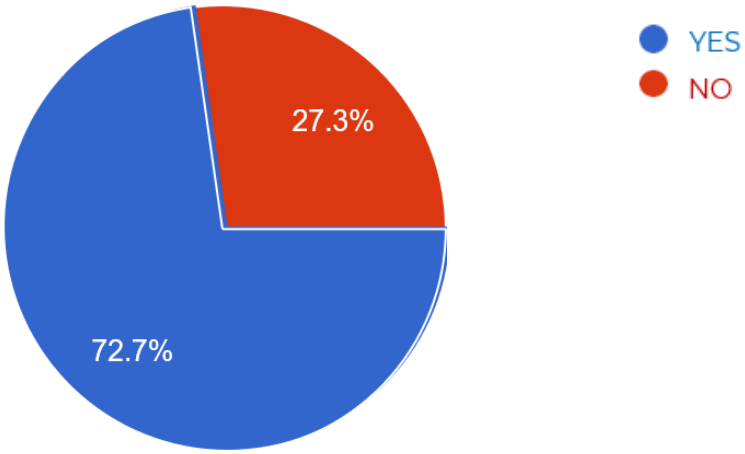
QUESTION 5a If you answered NO, WHY? And would you propose anything else differently or additionally? (No responses)

QUESTION 6 -These are the BIM APPLICATION Specialisms. Do you agree that these can be specific skills, suitable and applicable to several AEC professionals?



QUESTION 6a If you answered NO, WHY? And would you propose anything else differently or additionally? (No responses either)

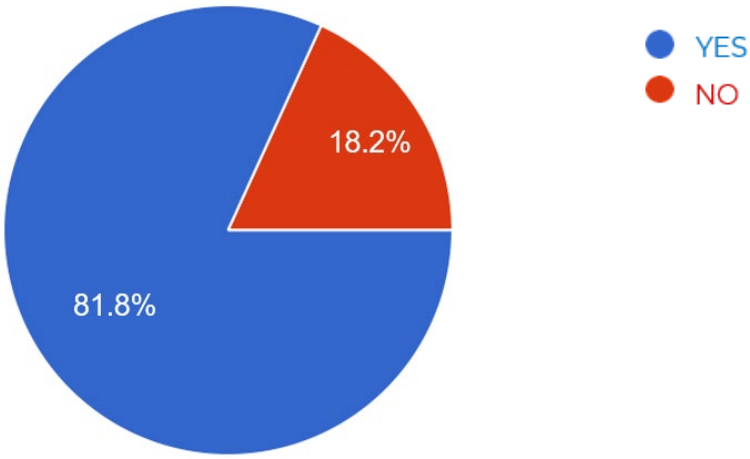
QUESTION 7- Do you agree that the ENERGY EFFICIENCY Specialisms can form a series of skills that can be applicable and useful to various AEC professionals, as part of their skillset in this field?



QUESTION 7a If you answered NO, WHY? And would you propose anything else differently or additionally? (1 response)

- *Not all professions in the sector are related to energy efficiency*

QUESTION 8- Do you agree that a Framework format of specialisms-and tasks, subtask based, with associated ULOs approach is valid and relevant for applicability to learning?

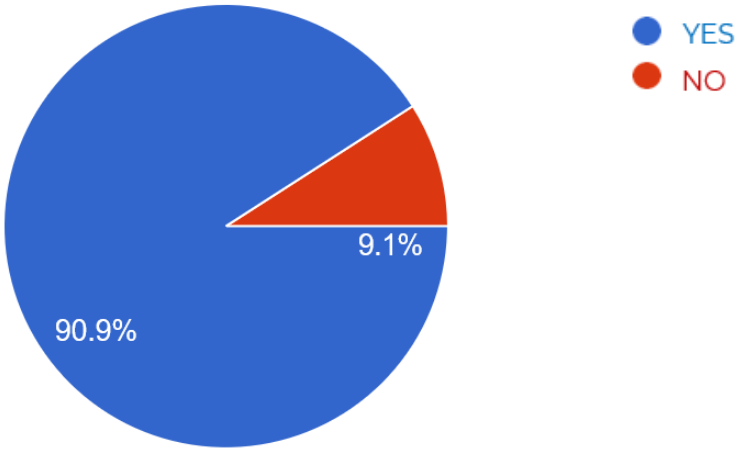


QUESTION 8a- If NOT: What would you propose as additionally or differently? (4 responses)

- *How to interlink with existing NQFs*

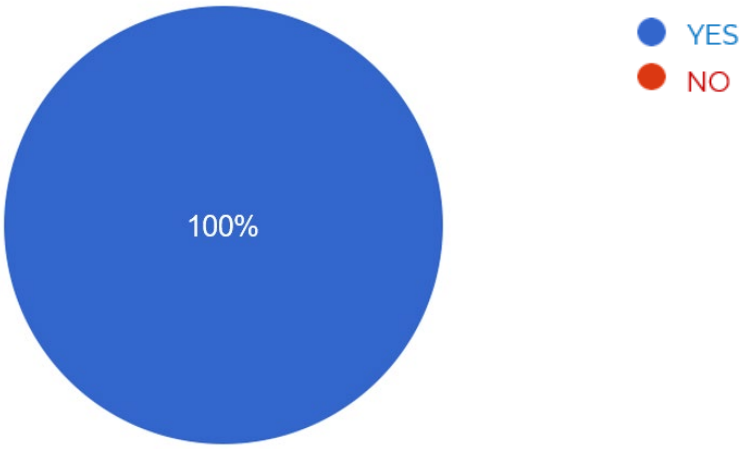
- *Comparison with international competences in the field (e.g. Building Smart)*
- *Propose a full learning pathway or a curriculum for a profession.*
- *More focus on blue collar professions in construction*

QUESTION 9- Do you agree with these ENERGY EFFICIENCY specialism tasks, subtask, and ULO examples?



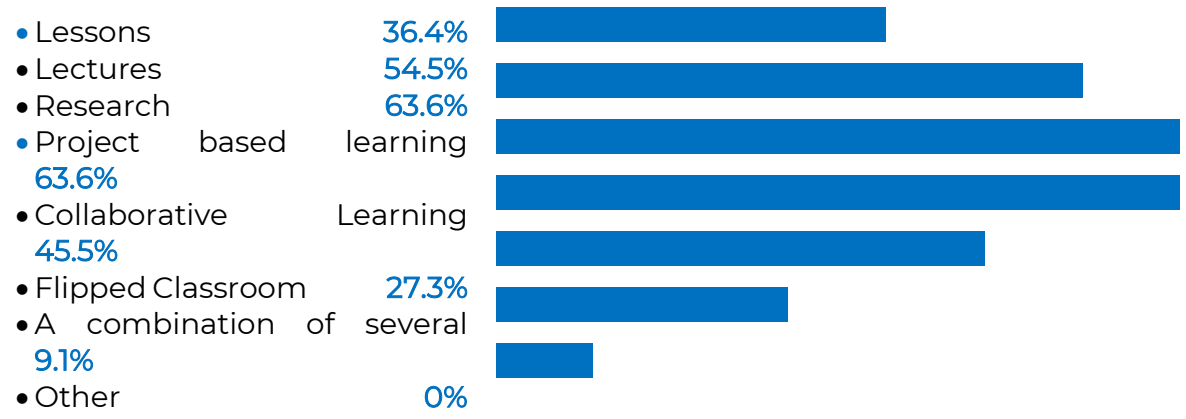
QUESTION 9a-If you answered NO, WHY? And would you propose anything else differently or additionally? (No responses)

QUESTION 10- Do you think that the field BIM and Energy Efficiency should be separate, and not embedded in the fields of specialism of BIM (i.e. BIM Basics, BIM Use, BIM Application)?

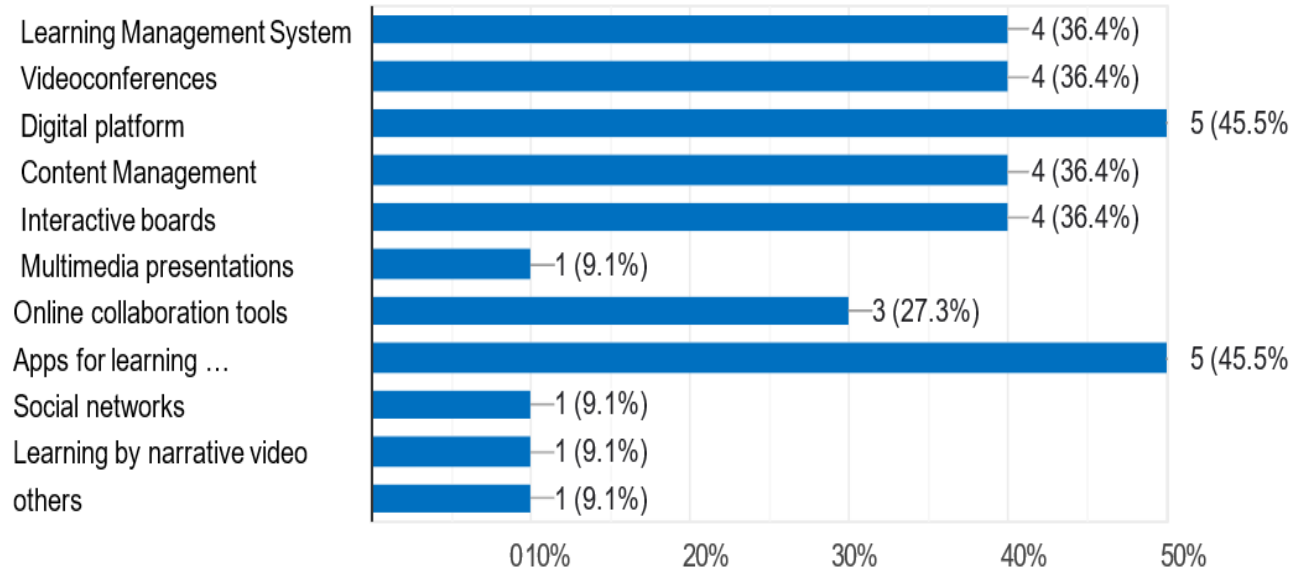


A10.5.3.3 Learning & assessment methodology & tools related questions.

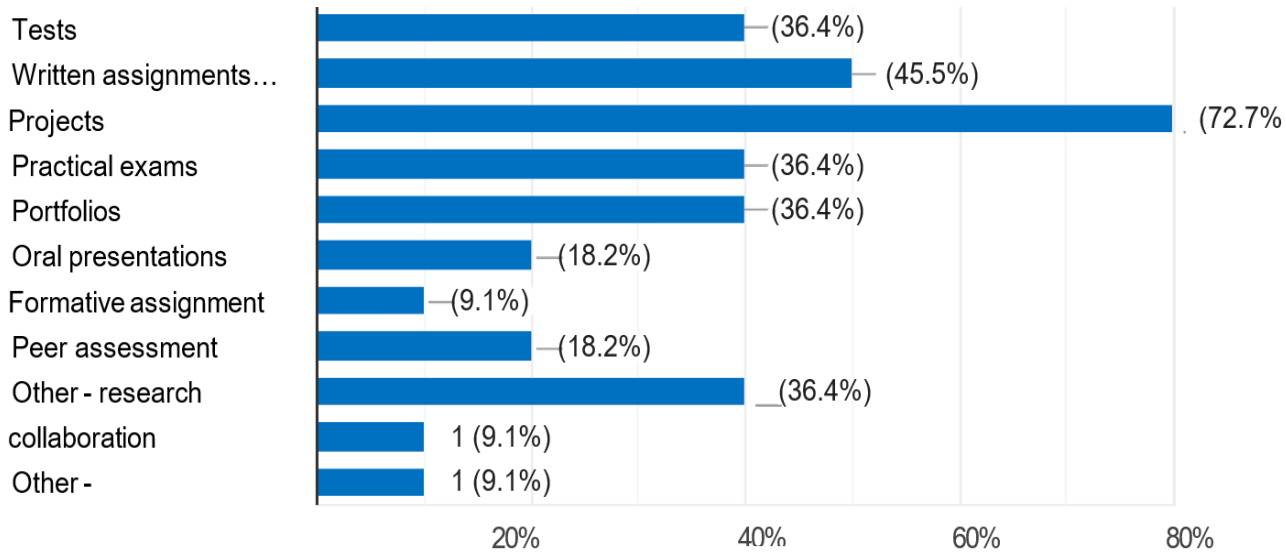
QUESTION 11- Which is your preferred learning METHOD? (select maximum 3)



QUESTION 12- Which LEARNING "TOOLS" do you prefer (please select maximum 3)?



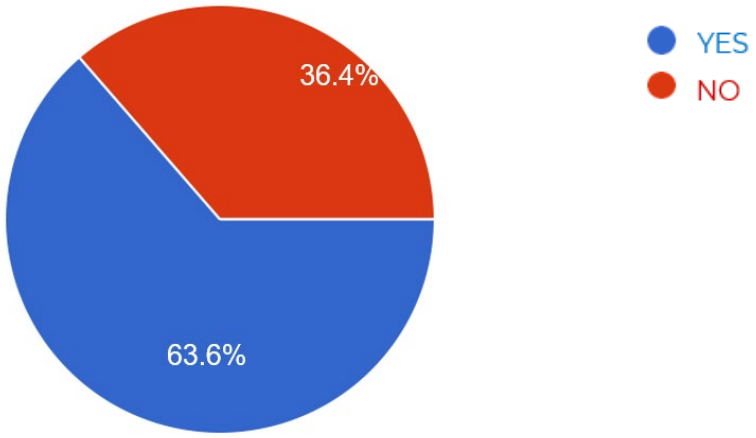
QUESTION 13- Regarding ASSESSMENT METHODS, which are your preferences (please select maximum 3)



Findings for question 11, 12 & 13 :

Possibly one of the only surveys were research scored that high as methodology, however the usual preferences, take close lead: Project based and Lectures, with lessons coming next. These were formats that WP6 and WP5 used in the Trials. Research was not the most widely used by ARISE, as it was not the best suited for automatic large-scale evaluation/assessment (without tutor intervention). It is also, not the most appealing for blue collar users. Research type activities were facilitated more in terms of external links and associated literature to read. Written assignments also scored high in assessment methods. ARISE and WP5 and WP6 reserved those only when required, as Skills maturity elevates (as well as EQF level) and therefore those type of assessment become more necessary to fulfil assessment criteria. Online test scored relatively high in preferences, which was the most common form implemented in sample trials.

QUESTION 13- Since COVID19, online education has become common. Are the methodology and resources proposed by ARISE sufficient, in the context of professional training, to motivate students with a 24/7 access?



QUESTION 13a- Do you suggest anything additional - resources/ features?

- *"Lectures with real life examples"*
- *"Work on real projects in practice"*
- *"Case studies "*
- *"Lectures delivered by practitioners"*

A10.5.3.4 Overall Finding and suggested actions/ considerations for ARISE improvement.

WP6 analysed results from the feedback survey done with Industry professional, from various background in North Macedonia. We confirmed that these were in line with other survey results: with a high level of agreement and approval in relation to the QF concepts and specific. These continued to validate positively the work of WP3 and overall ARISE approach (WP5, WP6 and others). Even when analysing in detail the qualitative follow ups answers, WP6 did not consider those answers to reveal opposition of the overall concept, but rather suggestions and recommended addition to it.

WP6 analysed responses and based on that made recommendations/ comments to inform other relevant WP6 to which they may had applied to. The most relevant as follow:

User feedback	Recommended action/ consideration
"All fields of specialisms included in the construction process should be encompassed by the QF"	The ARISE QF is a flexible and expandable Guideline. More granular and subdivision can be made into further task and subtask if required. And competencies and ULOs are applicable to several professional. Micro modules approach can cater for personalisation and creation of bespoke Pathways.
Circular economy *Materials lifecycle* *environmentally friendly construction products*	Subjects considered to be integrated/ embedded into Trial material content production and/or for exploitation/ further implementation phase
BIM Basics should have one initial level and advanced level different for various professions.	BIM BASICS tasks & subtasks were set to an initial indicative EQF level 3- low end of the ARISE maturity skills scale. This catered for all Industry and stakeholders (PA, clients, as blue collars too) Then, additional micro modules, and Training plans can be added to raise the Maturity level and to provide further advanced knowledge. WP6 considered that this approach for QF delivery and Trials was addressing the comment.
These specialisms should be linked to other software and ICT skills. *The BIM Support is usually associated with tech support services in companies.*	For the ARISE QF, Bim support is related to competence and knowledge of assuring adequate software and hardware is being selected. Basic competences in assuring standards of BI BIM security and Data security are identified and followed. That overall technical management of data is established, for example CDE organisation, setup, and permission management. Then the specifics and technical applicability will indeed relate to each individual software or IT solution in fact is something more related to services and It companies as per comment.

	But the ARISE QF focuses on the overall enabling and actionable competencies of users. Once more the flexibility and expandability of the QF and the micro modules approach can cater for covering the particular of a set solution, when required, while still connected to the overall Task, Sub task objective.
Not all professions in the sector are related to energy efficiency.	All professional will have a role and responsibility, even if indirect. As a subject, EE has been integral, embedded and contextualise into the overall ARISE QF. Certain professionals do not need to undertake the specific tasks or specialism in the EE group. ARISE allows for bespoke pathways with the micro-module approach. each professional can upskill to the relevant needs of their roles. Exposure and steps into digitisation tools will help, even if indirectly, to facilitate to drive the market into the desired direction for EE
How to interlink with existing NQFs *Comparison with international competences in the field (e.g. Building Smart)*	Overall desktop studies were conducted to compare to training in NQF, and Building Smart existing Training,
Propose a full learning pathway or a curriculum for a profession. *More focus on blue collar professions in construction*	QF specialism developed by QF are linked to professions. Additional bespoke pathways can be created with the micromodules for specific professions. For example the BIM application Specialism, BIM modelling- task Create as aspect model, can originate different sub pathways for professions (eg, engineers, Architects, Designers, Contractors, etc.) This was experimented in the Trails, for example set of modules that can apply to all profession (UI based) and then specific more practical one could apply to each profession (covering the specific modelling

	tools for Arch models, or for Engineering systems, etc..) The ARISE QF allow for this. It's an overview "map". For future communications and presentation, even in exploitation phase, this could be made even clearer to potential trainees.
Energy Efficiency should be separate, and not embedded in the fields of specialism of BIM	This comes in-line with Consortium internal discussions and consideration about the QF and about adding a 5th group, that compiled from the embedded overall groups and specialism, the more explicit and direct tasks and subtask to form an extra more dedicated EE grouping (the 5th QF group) However, the importance of a holistic approach, is recognised by ARISE, and in other survey. WP6 had proposed this "5th" grouping, not negate those contents from all other 4 groups, but rather compile them for an additional more focused navigation (acting almost as a filter for more practical, explicit and more high maturity levelled competences). The market answers seem to favour that addition
Lectures with real life examples *Work on real projects in practice*	Examples of project-based exercises, with real life applicability were proposed and used in Trials sampling
Case studies	Proposed and embedded into some modules
Lectures delivered by practitioners	Proposed and sampled Virtual online classes addressed that

In summary, the main findings of survey:

There is interest from the national sector for the new framework of competences. The most recognized applicability is in the fields of BIM USE and BIM and Energy efficiency.

The methods of delivery are favourable, however more practical and hands on should be considered in further stages, especially for exploitation and market

implementation in the future. At Trial stage that could have posed challenges of implementation and delivery, as it would have required a more tutor, blended methodology, both for delivery and assessment. However, sampling of Bim BASICS and BIM APPLICATION were proposed to set stage, interest, and further demand for those other filed groups by the Market, which ARISE QF pilots a suitable prototype to follow.

There are suggestions to consider extending the ARISE framework with other fields of sustainability in construction, such as circular economy. Those have been taken on board and some investigation occurred during pre-production and production of Trials.

Suggestions point out on more focus required for blue collar professions in construction sector. BIM BASICS proposed sampling offers contextualisation and introduction on new methods of working that should permeate into blue collar workflows.

Ability to understand new sources and methods of assessing construction info, with more explicit visualisation's methods (compared to 2D) can contribute to the narrowing of the building performance gap.

A10.5.4 Netherlands

In the Netherlands the format was different. Instead of workshops, the ARISE consortium members held a series of meeting with different organisations. More details about this in chapter 12 of this (appendix) report.

A11 Specialised focus group feedback

A11.1 Context and acknowledgement

An open invite was sent to technical experts, including ARISE associated partners to participate in an additional focus group survey. Three professionals indicated availability to respond to the survey, representing different backgrounds and stakeholders in the AEC: Design & Coordination; Supply Chain and Certification; Energy Efficiency & Education and. ARISE would like those three expert participants for their help and inputs:

- Mr. Evgenie Petkovski- Quality Manager at CEIM - is an independent body for certification of construction products within Civil Engineering Institute Macedonia, from North Macedonia
- Mr Frederico Ramos- Principal at AEDA Singapore, architect and expert in Digital Construction and BIM Implementation, and international speaker in BIM conferences.
- Mrs. Margareta Zidar Lead Consultant in Energy Efficiency Department at EIHP- Energy Institute Hrvoje Pozar, in Croatia

A11.2 Responses and findings

A11.2.1 Profiling

Participants nationality:

- Macedonian
- Portuguese
- Croatian

Participants Country of Residence:

- North Macedonia
- Singapore
- Croatia

Institution/ company:

- Civil Engineering Institute, Macedonia
- Aedas Pte Lta
- Energy institute Hrvoje Požar

Qualifications and Educational level:

- BSc
- MArch equivalent in Architecture and Environmental and Regional planning (post-graduation)
- Architectural engineer

Main Field(s) of Expertise:

- Quality management systems
- Energy efficiency in buildings
- Architecture

A11.2.2 Responses

Question 1

From 1 to 5, please classify: how far in the digitalisation route would you consider the industry is overall?

Question 2

What Digital Tools/ Methods do you believe are currently adopted in a wide scale in your region

ID	responses	
1	Autodesk (AutoCAD, Revit, Civil 3D, Navisworks)	North Macedonia
2	BIM for both Consultants and Contractors	Singapore/ Portugal
3	Mainly 2D documentation development	Croatia

Specific finding/interpretation/ conclusion from replies: In general, skills seem to be in the middle ground level. In Croatia, answer referring mainly 2D based processes seems to indicate possibly a lower maturity skill level than previously indicated, at least in terms of BIM application.

Question 3

What skills would you find useful to Industry to include in ARISE QF to be and considered for training and implementation? Why?

ID	responses
1	"Project management trainings. Skills which can be implemented when executing BIM activities."
2	"When considering the AEC Digitalisation, I believe it is fundamental to go beyond traditional BIM authoring tools skills. Parametric, algorithm design and AI skills will become core skills to survive in the upcoming years. Even if focusing exclusively on the BIM authoring tools, the ability to automate tasks and derive new workflows and solutions will be paramount to ensure competitivity. "

3	“highly important skills would be Planning & Conceptualizing and Simulating & Quantifying, with the potential to improve development of design and preparation of Bill of Quantities”

Specific finding/interpretation/ conclusion from replies: Some of the indicated skills would be at a high level of maturity. All indicated Skills are contemplated or possibly reached within the Overall QF structure.

Question 5

Any Further comments or suggestion for the ARISE programme and for the Proposed Framework/Matrix of competences, in terms of the skill gap in the market?

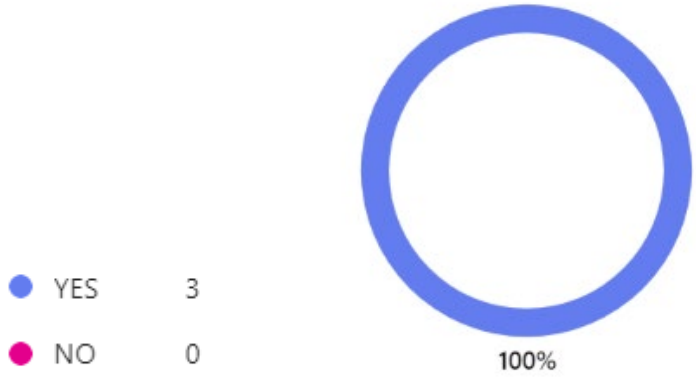
ID	Responses
1	Would suggest for the program to work directly with IT vendors of BIM software.
2	not at the moment
3	put focus on continuous BIM Basic promotions, as first steps are most difficult to implement

Specific finding/interpretation/ conclusion from replies: focus on continuous BIM Basic promotions supports our decision on the Trial initial intention of focusing on the BIM basics to bring Industry in first steps of adoption and clarifying benefits for both the supply and demand side of the industry to increase demand.

Closer relation with IT vender can help in implementation, if ARISE can advocate an Open BIM stance and assure a neutral unbiased approach.

Question 6

a) Do you agree with the Matrix of Competence and QF General Grouping (4 + 1 embedded) as a possible- valid and viable- approach?

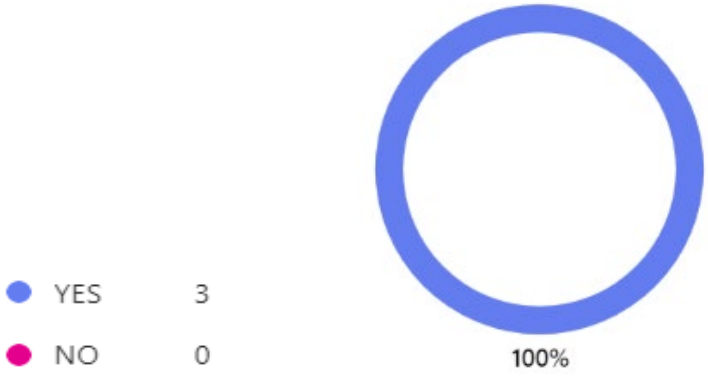


b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES you can justify or simply answer N/A.

N/A

Question 7

a) Do you consider BIM BASICS as a Specialism that can serves as the initial foundational knowledge for further Qualifications, and should be part of professional basic skillset?

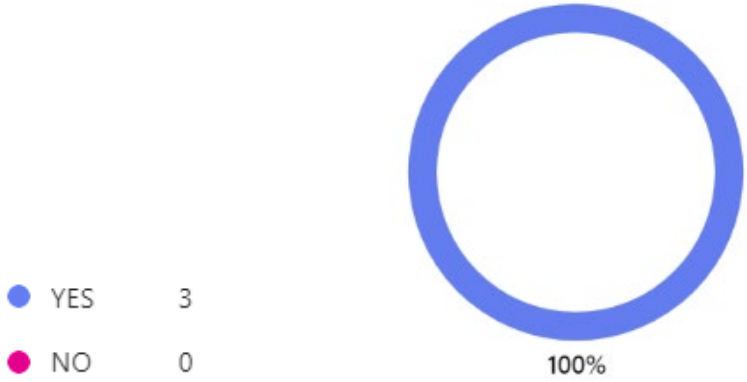


b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES you can justify or simply answer N/A.

N/

Question 8

a) Regarding the BIM SUPPORT Specialisms: Do you agree that these can be the Specialism and Qualifications regarding assisting in the technical support and requirements to enable BIM and digital implementation?



b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES you can justify or simply answer N/A.
N/A

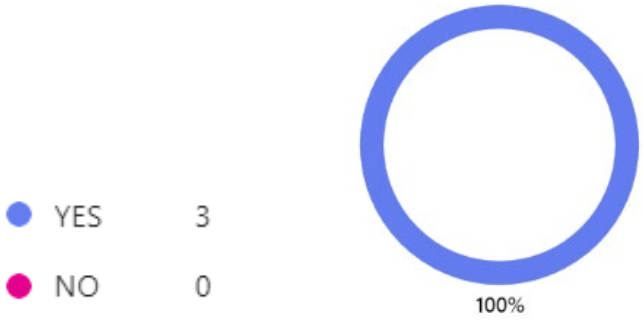
Question 9

a) Regarding the BIM UTILISATION Specialisms: Do you agree that these can be specific skills, suitable and applicable to several AEC professionals?

b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES you can justify or simply answer N/A. N/A

Question 10

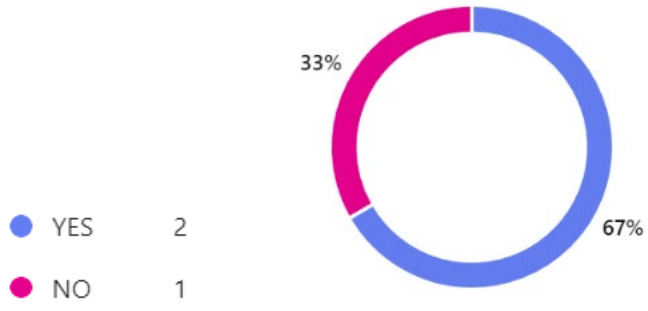
a) Regarding the BIM APPLICATION Specialisms: Do you agree that these can be specific skills, suitable and applicable to several AEC professionals?



b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES you can justify or simply answer N/A. N/A

Question 11

a) Do you agree that the ENERGY EFFICIENCY Specialisms can be and form a series of skills, that can be applicable and useful to various AEC professionals, and imbedded into all other AREAS, as part of their skillset in this field?



b) If you answered NO, WHY? And would propose anything else differently or additionally? If you Answered YES, you can justify or simply answer N/A.

ID	responses
1	N/A
2	Clarifying that more than Energy efficiency, it might be more meaningful that energy efficiency is considered holistically as part of Carbon Neutrality Specialisms
3	N/A

Specific finding/interpretation/ conclusion from replies to question 6 to 11: Participant generally agreed with QF structure. The comment about ensuring a holistic approach and Naming is valid. ARISE QF is flexible and ULOs knowledge base incorporate Carbon concepts, embedded into basic modules at a Skills Maturity level 1. We took on board the comment reminding of Energy efficiency contextualised as part of carbon neutrality and to ensure that trainees understand that encompasses many factors and stakeholders. Comment helped informed WP6 and WP5 materials and trial pilot testing work. EE term was used during project lifetime, but naming can easily change at any stage of implementation and/ or exploitation without any compromise to the QF.

A12 Others forms of validation

A12.1 Approval/validation by professional bodies

During trials and preparation, several professional bodies we contacted directly by ARISE. These contacts were carried out by WP6 in conjunction with WP8, and facilitated by the individual consortium members and partners when possible.

As we procured to secure approval and support and dissemination by these professional bodies, the ARISE project and the Framework was presented. This enabled it to be assessed by those professional bodies' representatives, usually members in charge of education and CPDs, but also familiar with the themes of digitalisation and EE, before information being communicated by them to their respective members and network.

ARISE and WP6 considered that in this process, receiving the support by those bodies and/or disseminations actions towards their members relative to ARISE, an additional/ alternative validation method/ indicator of the project goals, the ARISE Framework and qualification Schemes, and the proposed delivery.

Some examples of such Professional bodies that supported and disseminated are OA (Portugal), RIAI (Ireland), CIAT (UK), and Chamber of Certified Architects and Certified Engineers.

A12.2 Further approval/validation for Framework for future integration and implementation in qualification schemes or by upskilling providers.

In the Netherlands, there was a low uptake of users in the Trails and platform register. This is due to multiple existing Dutch e-learning platforms that professionals and organizations are familiar with, combined with fatigue of e-learning derived from Covid period.

However, a very positive signal, additional and alternative to surveys, for ARISE deliverables validation in WP6 was obtained. Especially the validation of the Matrix of Competence- Framework & Qualifications Schemes that was developed by WP3.

To help during its development, and assisting WP6 in its feedback validation, the ARISE Framework was discussed by the Consortium Partners in the Netherlands (ISSO and Building Changes) with the following entities and technical groups in a series of informal meetings:

DigiGO (national body for digital implementation). DigiGO launched a very large nationwide program for improving digital skills in the Netherlands (DigiVaardig) and indicated that they will use the ARISE QF as the backbone for the development. This includes executions of training, for their knowledge base, scans and monitoring as well as for certification/recognition. Meeting held in 2022/2023 (writing the program plan) and 2024 ongoing regarding possible effective implementation.

BuildingSmart Benelux, NL chapter. BuildingSmart has recently launched their international Professional Certification Program and is aiming to cooperate with the DigiGO program (DigiVaardig), and therefore using the ARISE QF. Meetings held during 2023 and 2024.

SKG-IKOB (certification institute). SKG-IKOB mainly certifies processes and products and is looking into using the ARISE QF for professional certification as an addition to their services. Meeting held in September/October 2024

BNA (vocational organization of Dutch architects). The BNA was very positive about the QF and researching if the QF-methodology and (when updated) the content

can be applied in their new structure for contractual agreements. Meeting in end of 2023/begin of 2024.

DigiCampus GWW (regional PPP of 30 infrastructural organizations). For the 2025 the DigiCampus GWW indicated that intends to embed (the updated version of) the ARISE QF into their working structure, to help their employees with micro-learnings and insight in their development needs and to research if the ARISE QF can be integrated further in their AI-ecosystem. Meeting held in 2024, and they have been keeping continuous attention for ARISE results.

Several public and private training organizations (BIM4ALL, Root BV, Anno1809, Avans+). Most of the public and private training organizations in the Netherlands who focus on training BIM skills are positive on the existence of the QF and want to see if their trainings can be plotted on the QF. They felt and indicated that the responsibility of implementation the QF should be with BuildingSmart NL and with DigiGO. One training provider (BIM4ALL) indicated interest in taking steps in the future to look on how to integrate the QF in their services (training and monitoring).

Discussions were also held with the *Wij Techniek*, an educational development fund for the installation sector, that publish under the name of the Vakbekwaamheidscommissie (Professional Competence Committee) the skills descriptors used in the sector). The Vakbekwaamheidscommissie is an initiative by social partners in the technical sector, including Techniek Nederland, NVKL, and various unions. The VBC works independently to ensure the competence of professionals in the technical installation industry. They develop, define, and manage professional standards and routes to maintain and verify the skills and knowledge required in the industry.

Wij Techniek indicated to the Consortium partners that, when their skills Framework is updated in the nearby future, the ARISE qualification framework would be further discussed for integration and use. This was another validation indicator for the ARISE Framework Competence Matrix of Qualifications, as otherwise it wouldn't be considered for further discussion for future integration.

Most of these have the potential to be further explored and capitalized in the exploitation period. It also opens the Dutch market for uptake of the e-learning content in Dutch platforms. The direct uptake for ARISE from this discussion for WP6 is the positive feedback, and clear validation of the effectiveness and suitability of the QF developed by WP3 to professionals.

Resulting from those discussions and presentations, the ARISE Framework and Matrix of competencies, and its key principles was approved in concept, with no relevant issues nor objections relevant to note.

A13 Conclusion (Appendix 01 – D6.3)

The known anticipated barrier, identified earlier in the project by WP6 (and referred to in D6.1, D.2 and D6.3 reports) was the lack of willingness of professional to spent part of their time to partake in survey, materialised and recurrent during the project duration.

WP6 worked and implement several measures to try and collect enough feedback, with a valid sample to test and validate the competence Matrix-Framework of Qualification, and the Arise training methodology with market stakeholders. This related to tasks 6.1, 6.2 and 6.3, as well as to inform the follow-up WP6 task, assisting other WPs, for example WP3 and WP5.

Based on the results from the events and surveys, we can conclude by analysing the responses presented in this report, that overall majority of market stakeholders consulted, had responded positively. They have validated the ARISE proposed Matrix of Competence- Framework for Qualification as well as recognition of Skills, and its components, as a suitable method of framing, structuring and conducting upskilling of the proposed subjects to the market stakeholders (supply and demand).

WP6 considered confirmed in concept by these reported actions, and its results the *suitability of maturity level matrix and framework content, as well as training material approach, methodology & Format.*

1) To confirm*: Benefits and impact of the application of acquired skills.*
2) *To facilitate and recommendation to other WPs for improvement of their outputs.*