



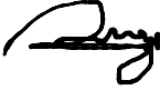

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## **WP 7: Dissemination and Exploitation of Results**

**D 7.8 ADMIRE Final Conference**

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Version	Date	Author	Institution	Status	Change Description
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Final	20/10/2020	Suryanarayanan Krishnaswamy	Cranfield University	Draft	Updated with information about both ADMIRE Final Conference events

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## Executive Summary

The current report details the efforts undertaken by the ADMIRE consortium to organise and manage the AM Symposium 2020 and Final Conference, part in line with the Dissemination, Sustainability and Exploitation Plan designed for ADMIRE. Both virtual events presented the objectives and the results from the project, along with guest lectures who talked about the need for AM education.

The structure of the report refers to each event – AM Symposium 2020 and Final Conference, respectively:

Introduction: This section primarily serves to introduce the project and then provide a brief outline on what to expect within the report i.e., its structure.

Event Conceptualisation: Here, the details how the virtual event was planned and the challenges during this stage particularly due to the COVID-19 pandemic are discussed.

Invitation for the Event and Agenda: The preparation for the event, including details of the agenda are presented here. Additionally, the web and registration pages created specifically for the event are also given.

ADMIRE project's presentation: The actual presentations during the event are briefly discussed here.

Symposium evaluation and analysis: The analysis carried out on the data presented before, during and after event. The majority of this section deals with the satisfaction questionnaire and the insights gathered through the responses.

Conclusion: The final section summarises the report and details the major findings, both positive and negative to assist future endeavours.

ADMIRE Final Conference: Part B of the report details the efforts undertaken to organise another event which was the projects final conference. In this section, the different presentation and results of the audience polls are presented and analysed for the benefit of future events.

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## 1 Introduction

ADMIRE Additive Manufacturing Symposium 2020 was a half-day online event designed to disseminate the results of ADMIRE and how they can be exploited by the participants in line with the purposes of ADMIRE Final Conference (which was planned to be carried out in a face-to-face session). Because one of the objectives of the project was to create a common ground for sharing of information between the different actors in the Additive Manufacturing (AM) field, it was believed an event like this could assist in getting people together, closing the gap between Education and AM Industry and, help develop future relationships between key stakeholders from both sectors. Additionally, it was also thought that the lessons learnt whilst developing the MSc course and the AM Hub/Platform would be beneficial to the wider community if they embark on a similar journey. This event was developed to satisfy the objectives of ADMIRE Work Package 7- *Dissemination and Exploitation of Results*.

Therefore this report will initially introduce the reader to how the event was conceptualised and planned. Then, the report will move onto the dissemination strategies adopted to publicise and market the event along with their impact. Next, the actual presentations during the symposium are briefly discussed followed by the satisfaction questionnaire evaluation. The results of the satisfaction questionnaire were analysed and will also be presented. In addition to this, the report will also focus on other information generated before and during the event itself to gain novel insights and help plan future AM symposiums.

Finally, the report also elaborates another event, “ADMIRE Final Conference | Skilling the AM Future 2020”, which was an additional half-day online event that focused on the Pan-European MSc and its pilot. The event was also used to host an online World café meeting and share its results.

## 2 Event Conceptualisation

Due to the COVID-19 pandemic and the resultant government guidelines that prevented the ADMIRE Final Conference from being carried out physically, ADMIRE partners conceptualised an online event. Entitled *ADMIRE Additive Manufacturing Symposium 2020*, it would meet the same purposes of the Final Conference (i.e. to present the project’s results and how they can be exploited), having the additional benefit of a wider reach and a higher impact since participants would not have to physically travel to the location.

After a few trials involving the ADMIRE partners, and a consultation with Cranfield University’s IT team, it was decided to carry the event out using the ZOOM platform.

The online nature of the event was one of the reasons why it was limited to half-day. In this particular setup, it is challenging to maintain networking discussions and interactions that are a part of a full day event. Additionally, it was thought that a longer online event would require higher levels of focus from participants and increase “ZOOM fatigue” [1][2][3], hence the time limit for the Symposium.

Since the main aim of the event was to talk about ADMIRE and to present its results to all participants, the majority of the Symposium’s sessions would be dedicated to the various

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details of the project. However, it was also decided to include a guest lecture from a respected name in the field so that the event would serve an additional purpose of general AM knowledge exchange. To that end, the consortium approached Professor Stewart Williams (Director of the Welding Engineering and Laser Processing Centre and, Chief Technology Officer of WAAM3D) due to his extensive research and educational experience; Prof Williams kindly agreed to be the guest speaker for the Symposium. Once the presentations were decided and agreed upon, an agenda was drawn up and is presented subsequently.

### **3 Invitation for the Event and Agenda**

Once, the details and the date of the event were agreed upon by all partners and Cranfield University worked with their events team to create and publish an event web and registration page (<https://www.cranfield.ac.uk/events/events-2020/admire-additive-manufacturing-symposium-2020>), which was then shared with the ADMIRE consortium for public dissemination.

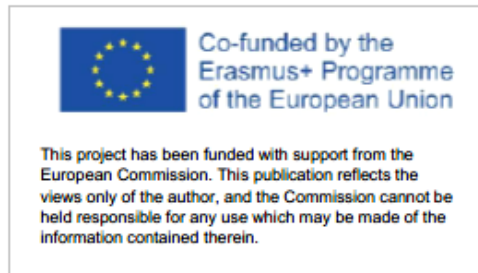
#### **3.1 Agenda**

The agenda of the Symposium (as mentioned previously) was drawn up and is given in Figure 1. To enable the event to be more effective, each presentation/topic was limited to a time of 45 minutes since this was what, on average, was recommended for running an online event [4][5]. Although Hugel [6] suggests a slightly longer length of 60 mins, it is thought that a 45 minutes session on paper gives the organisers some flexibility on the day. Additionally, using further recommendations from the literature mentioned above, polls, Q&As and the chat were utilised throughout to foster participants' interaction with the session and make the overall experience more rewarding.



**ADMIRE Additive Manufacturing Symposium 2020- Agenda**

Time	Event	Speaker(s)
0930-1000	Introduction and Welcome	Surya Krishnaswamy (Cranfield University)
1000-1045	Aim/objectives of ADMIRE	Susana Nogueira (EWF)
1045-1130	Guest Lecture- <i>The need for AM education</i>	Prof. Stewart Williams
1130-1145	<i>Break</i>	
1145-1230	Results from ADMIRE	Susana Nogueira (EWF) Inês Pires (IST) Surya Krishnaswamy/Filomeno Martina (Cranfield University) Yuvaraj Patil (University of Bremen)
1230-1300	Conclusion	Surya Krishnaswamy (Cranfield University)



**Figure 1 ADMIRE AM Symposium Agenda**

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### 3.2 Web and Registration Page

Once the agenda was decided, a webpage was created with the help of Cranfield University's events team. This served as a "landing" page for anyone interested in the event.

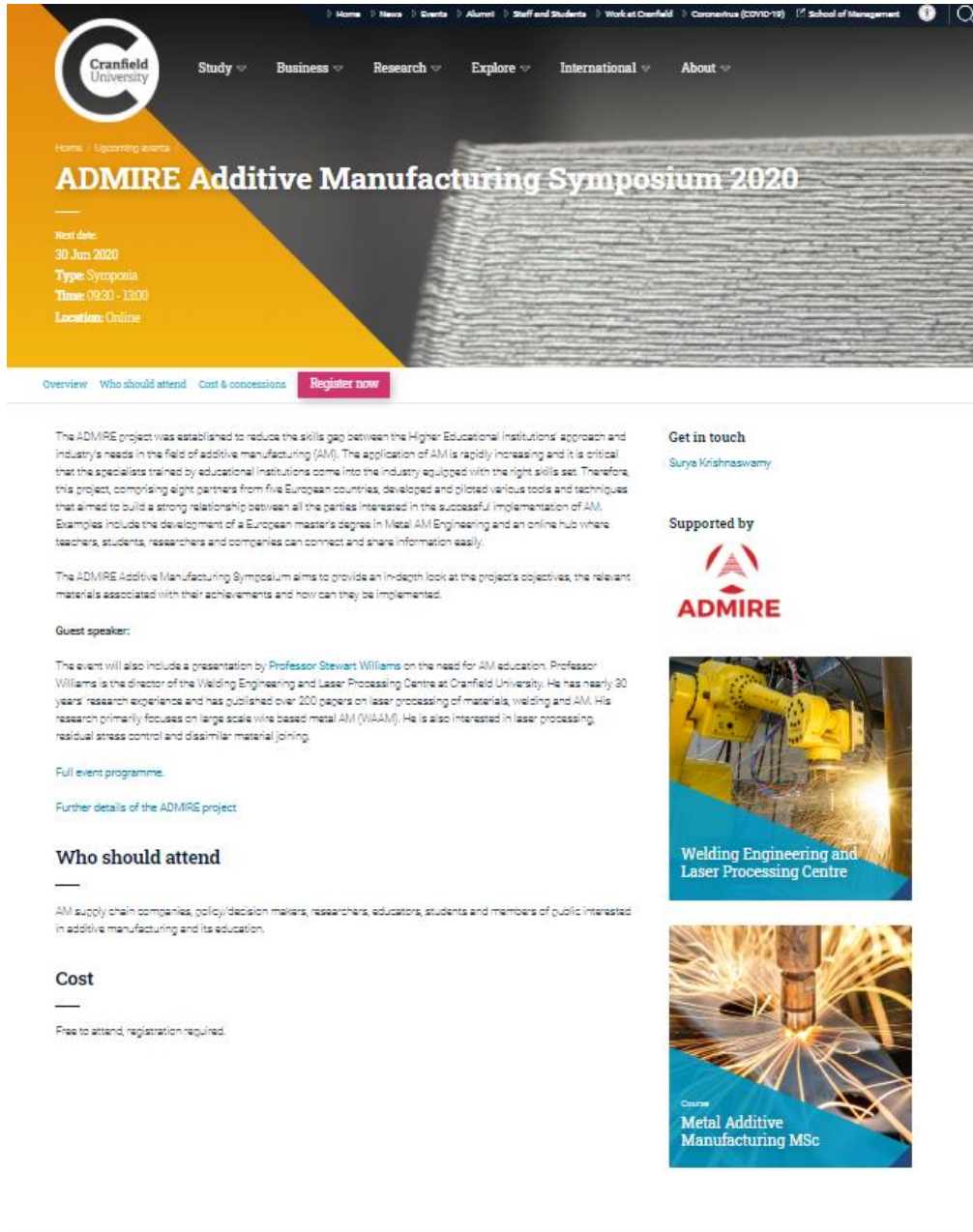


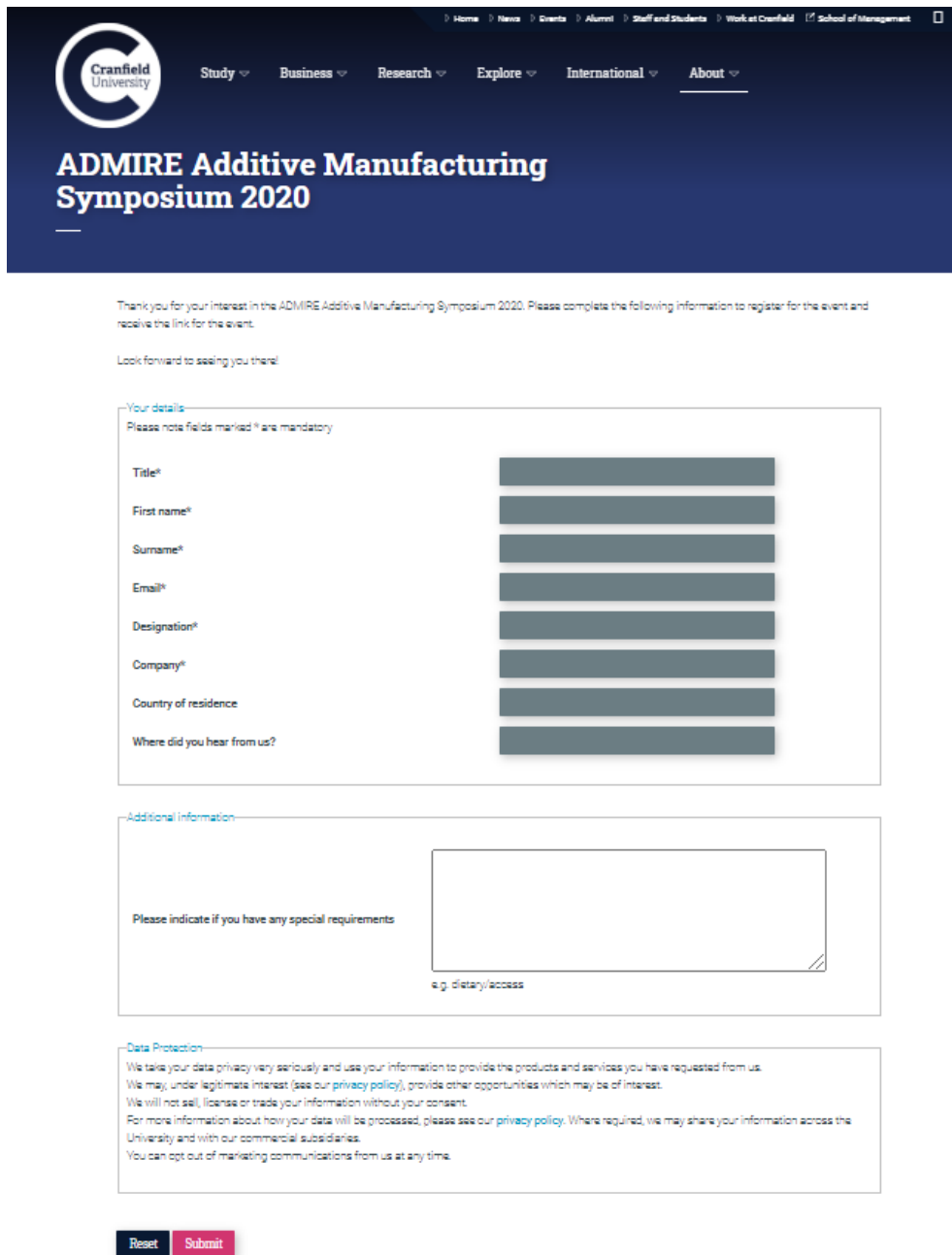
Figure 2 Webpage

Shown in Figure 2, the page carried the details of the event such as the date and time. There was also an introduction to event which gave the readers a brief summary of ADMIRE and the guest speaker- Prof Williams. Further, the agenda and the ADMIRE website were linked to the page as well. Finally, there was a "Register Now" button in maroon that directed potential attendees to the registration page.

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The registration page, shown in Figure 3, asked the participants for certain details such as their names, designation, workplace, country of residence and where they heard about the event for monitoring purposes. Their emails were also requested so that the event link and the satisfaction questionnaire could be sent to them. Finally, there was an option for the participants to add any special requests if needed.

Once the registration was submitted, their details were automatically sent and stored in a separate folder within the mailbox of one of the consortium members from Cranfield University. The registered participants also automatically received an email thanking them for their interest along with the event and satisfaction questionnaire links, as shown in Figure 4.



Thank you for your interest in the ADMIRE Additive Manufacturing Symposium 2020. Please complete the following information to register for the event and receive the link for the event.

Look forward to seeing you there!

**Your details**

Please note fields marked \* are mandatory

Title\* [Redacted]  
First name\* [Redacted]  
Surname\* [Redacted]  
Email\* [Redacted]  
Designation\* [Redacted]  
Company\* [Redacted]  
Country of residence [Redacted]  
Where did you hear from us? [Redacted]

**Additional information**

Please indicate if you have any special requirements [Redacted]  
e.g. dietary/access

**Data Protection**

We take your data privacy very seriously and use your information to provide the products and services you have requested from us. We may, under legitimate interest (see our [privacy policy](#)), provide other opportunities which may be of interest. We will not sell, license or trade your information without your consent. For more information about how your data will be processed, please see our [privacy policy](#). Where required, we may share your information across the University and with our commercial subsidiaries. You can opt out of marketing communications from us at any time.

Reset Submit

Figure 3 Registration page

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Hello

Thank you for registering for the ADMIRE Additive Manufacturing Symposium, 2020. We are extremely happy to be able to welcome you to the event. Please use the following link to attend the event on the day.

[Event Link](#)

We would also be extremely grateful if you could take the time to fill in a satisfaction questionnaire about the event to help us improve in the future.

[Satisfaction Questionnaire](#)

Kind regards,

The [ADMIRE Consortium](#)

Figure 4 Registration response email

### 3.3 Dissemination and Impact

Once the pages were setup, an email from Cranfield University was sent to the ADMIRE consortium to share the webpage link through all potential channels. In addition, Cranfield University also carried out its own dissemination activities.

The event was shared on social media through Facebook and LinkedIn by Cranfield’s representative in ADMIRE, as shown in Figure 5. The event was also shared by a few other members of the Welding Engineering and Laser Processing Centre at Cranfield including the previous representative of ADMIRE. The number of views for the LinkedIn posts are shown in Table 1. It must be noted that the number of views reflects the information available to the author at the time of writing and that there may be more posts by other members that the author is not aware off. Additionally, the social media posts of the other university members are not shown in the report for the sake of brevity and potentially breaking any GDPR regulations.

Hello Everyone, I hope everyone of you is well and safe at this time. In these rather different times, one of the things that has probably kept us all going is the plethora of online events that allow us to stay engaged whilst still in our own homes.

I am delighted to say that we too have jumped onto this and have an event next Tuesday (30/06/2020). This online symposium will talk about about the difference in skills between industry and academia within the Additive Manufacturing field and what was done to try and reduce the gap.

So please do register and attend (its free!). We would love to see you all there even if you are not related to additive manufacturing since some of these strategies may be adaptable to your fields as well!

#additivemanufacturing #admire #AMSymposium2020 #3dprinting #education #webinars



a

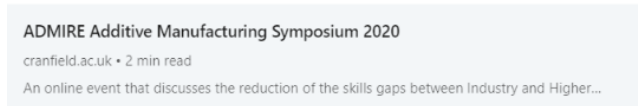
Hello Everyone, I hope everyone of you is well and safe at this time. In these rather different times, one of the things that has probably kept us all going is the plethora of online events that allow us to stay engaged whilst still in our own homes.

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So please do register and attend (its free!). We would love to see you all there even if you are not related to additive manufacturing since some of these strategies may be adaptable to your fields as well!

#additivemanufacturing #admire #AMSymposium2020 #3dprinting #education #webinars

<https://lnkd.in/enWRvc>



b

Figure 5 Social media posts a) Facebook and b) LinkedIn

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Table 1 Number of views for the LinkedIn\* posts by members of WELPC

Post	Views
ADMIRE Representative from Cranfield	682
Former ADMIRE Representative from Cranfield	850
Others in the Welding Engineering and Laser Processing Centre	1985
<b>Total</b>	<b>3517</b>

\*Only LinkedIn views are shown as this was the only information available

Additionally, the former representative of ADMIRE from Cranfield also shared the information on their twitter page (Figure 6) which had 350 views. The Symposium was further shared on Cranfield University’s official twitter page (Figure 7) which boasts 23.2K followers at the time of writing this report and also in the University intranet’s events page which is accessible to all staff and students (Figure 8).



Figure 6 Tweet from the former representative of ADMIRE from Cranfield



Figure 7 Tweet from Cranfield University

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**TITLE:** WP 7: Dissemination and Exploitation of Results

**Subject/Deliverable:** D 7.8 ADMIRE Final Conference



**General events:** ADMIRE Additive Manufacturing Symposium 2020

**ADMIRE Additive Manufacturing Symposium 2020**

30/06/2020 09:30 - 13:30 ( )

Online

The ADMIRE project was established to reduce the skills gap between the Higher Educational institutions' approach and industry's needs in the field of additive manufacturing (AM). This project, comprising of eight partners from five European countries, developed and piloted various tools and techniques that aimed to build a strong relationship between all the parties interested in the successful implementation of AM. Examples include the development of an European master's degree in Metal AM Engineering and an online hub where teachers, students, researchers and companies can connect and share information easily.

The ADMIRE Additive Manufacturing Symposium aims to provide an in-depth look at the project's objectives, the relevant materials associated with their achievements and how can they be implemented. The event will also include a presentation by Professor Stewart Williams on the need for AM education.

The symposium is free to attend and the registration page can be accessed from the event page shown below:

The event page: <https://www.cranfield.ac.uk/events/events-2020/admire-additive-manufacturing-symposium-2020>

**Figure 8 Cranfield University's intranet announcement**

Apart from sharing the information on social media, the event was also circulated through multiple internal emails to the staff and students at Cranfield University's Welding Engineering and Laser Processing Centre and, School of Aerospace, Transport and Manufacturing (shown in Figure 9) as well as personal contacts.

**Sent on behalf of Surya Krishnaswamy  
Research Fellow – Additive Manufacture**

Dear Colleagues

I hope you and your families are keeping safe and well.

We have scheduled a half-day symposium on Education in Additive Manufacturing next Tuesday, 30<sup>th</sup> June, from 9.30 am until 1.00 pm, as part of a Erasmus+ project (ADMIRE) that Cranfield is involved with. This symposium will talk about the objectives and results achieved by the project that looked to reduce the skills gap between industry and academia using different strategies; it also features a talk by Professor Stewart Williams, Professor of Welding and Science Engineering at Cranfield.

Please could I ask you to review the link below that provides further information about the Symposium.

Event link: <https://www.cranfield.ac.uk/events/events-2020/admire-additive-manufacturing-symposium-2020>

Kind Regards

Surya

Surya Krishnaswamy  
Research Fellow – Additive Manufacture  
Email: [s.krishnaswamy@cranfield.ac.uk](mailto:s.krishnaswamy@cranfield.ac.uk)

**Figure 9 Email sent to the staff and students of Cranfield University's School of Aerospace, Transport and Manufacturing**

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Finally, the event was also shared in ADMIRE's website (Figure 10) as well as another project from Cranfield University that involves a consortium of multiple partners; NEWAM (Figure 11).

The report primarily focus on Cranfield University's dissemination due to it being their event and because of the data available to them however, it by no means implies the lack of effort by the other partners since their dissemination strategies are discussed in ADMIRE deliverable 7.5 *Dissemination Portfolio*.



**Figure 10 Advert in ADMIRE's website**

## Symposium on AM education as part of the ADMIRE project

When Jun 30, 2020 from 09:30 AM to 01:00 PM (Europe/London / UTC+00)

Where Online

Contact Name Surya Krishnaswamy

Web Visit external website

Add event to calendar iCal

The ADMIRE project was established to reduce the skills gap between the Higher Educational institutions' approach and industry's needs in the field of additive manufacturing (AM). This project, comprising of eight partners from five European countries, developed and piloted various tools and techniques that aimed to build a strong relationship between all the parties interested in the successful implementation of AM. Examples include the development of an European master's degree in Metal AM Engineering and an online hub where teachers, students, researchers and companies can connect and share information easily.

The ADMIRE Additive Manufacturing Symposium aims to provide an in-depth look at the project's objectives, the relevant materials associated with their achievements and how can they be implemented.

The event will also include a presentation by Professor Stewart Williams on the need for AM education.



**Figure 11 Advert in the NEWAM website**

It can be concluded that the dissemination and/or marketing strategies put in place by the whole consortium through direct and indirect links were successful since a total of 188 registrations were made. Further, during the event it was noticed that the level of participants never dropped below 50 and numbers greater than 80 were observed during certain times.

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## 4 ADMIRE project's presentation

Details of the different presentations are described in this section. It was decided, before the event, to have another member of consortium acting as a handler to assist the presenter. The handler's role was to monitor the chat and answer questions (if they could) and to also ensure that all the participants were muted (until otherwise required) to minimise other background noises. To keep things simple, the original presenters agreed to act as handlers in sessions they were not presenting and as such all the presenters were made co-hosts (in ZOOM).

The presentations themselves followed what was described in the agenda (Figure 1) and are divided accordingly in this section for convenience.

### 4.1 Introduction

Initially, all the participants were welcomed to the event and given a very brief introduction to ADMIRE (Figure 12) and the issues it addresses, particularly the need for a qualified workforce in AM and, the gap between Education and AM Industry. After this, there were a couple of Icebreaker events such as an audience poll (discussed in more detail in the next section) and a chat question. This was then followed by the introduction of the day's agenda and a few housekeeping notes such as letting the participants know that screenshots would be taken during the event; those images were subsequently blurred to ensure that the names and faces were unidentifiable and are shown in **Error! Reference source not found..**

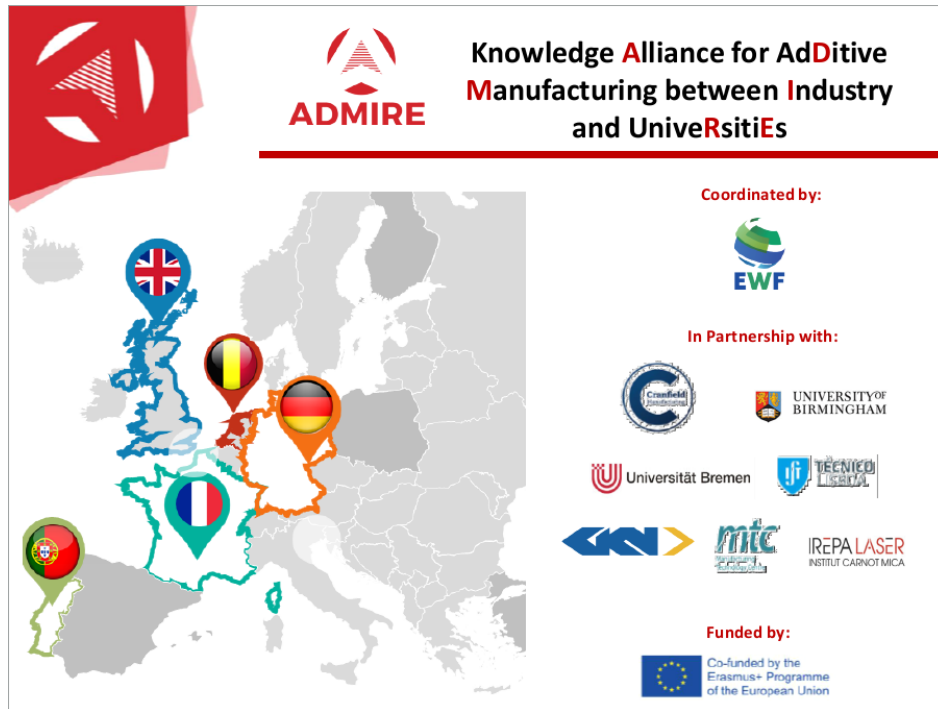
Figure 12 Introduction presentation

### 4.2 Aim and Objectives

Susana Nogueira (project manager of ADMIRE, from EWF) ran this session which presented the audience with the scope and purposes of ADMIRE. Before introducing the scope of the

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project, the different partners also presented themselves, their respective institutions and their contribution to the consortium (Figure 13). The various results (such as the master's course, AM Hub/Platform and the exchange of knowledge events) designed to achieve ADMIRE's objectives were also introduced. However, the introduction was brief since a latter session explored each result in more detail. Finally, to wrap this session, the benefits and value created by this project were shown to the audience.



**Figure 13 ADMIRE consortium**

### 4.3 Guest Lecture

As mentioned previously, Prof Stewart Williams agreed to be the guest lecture for the Symposium and presented a session on the need for education in AM (Figure 14). The session was very detailed and spoke about the importance of skills and knowledge to successfully implement AM for a given application with the right considerations. It was thought the entire lecture was very interesting and entertaining. There was evidence that this belief was corroborated by the audience because the Q&A session at the end was very lively, with numerous questions on a plethora of subjects. In fact, there was not enough time to finish this Q&A session and the discussion had to be cut short to keep up with the schedule.

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**Figure 14 Guest lecture**

## **4.4 Results**

The penultimate session of the Symposium concentrated on the results of the project- the master's course, AM Hub/Platform and the exchange of knowledge events (Figure 15). Although, led by EWF (Susana Nogueira), other partners (IST, Cranfield University and University of Bremen) contributed to it by taking turns to present their results and lessons learnt whilst piloting ADMIRE MSc's modulus and the subsequent feedback.

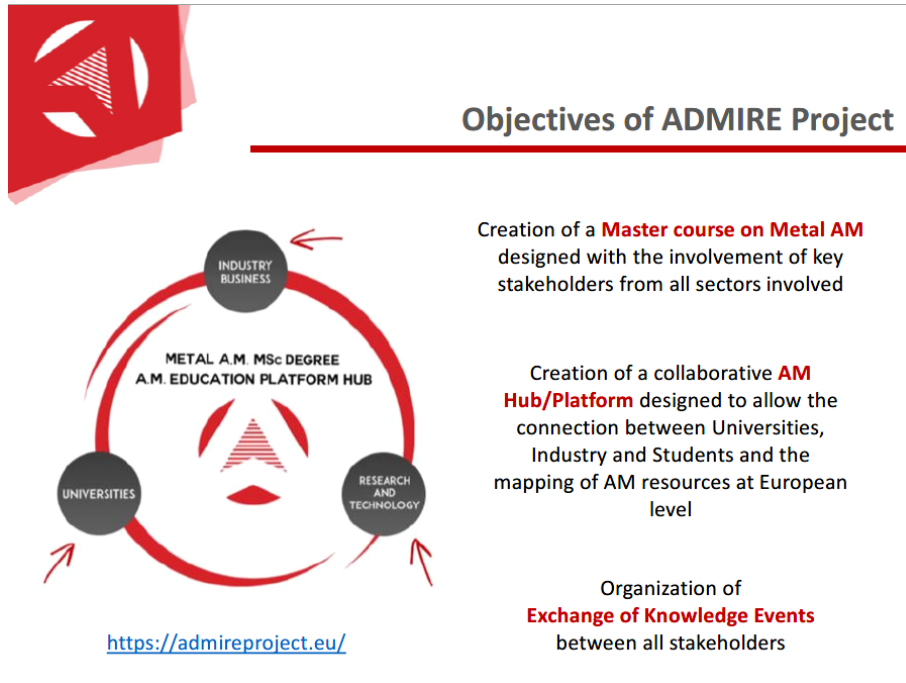


Figure 15 Three different areas of focus in ADMIRE

## 4.5 Conclusion

Once the results were presented, the event moved onto its conclusion phase. After all the presentations, the audience were asked another poll question about which part of the project interested them the most (discussed subsequently) and a chat question regarding the future of education (however due to falling behind the schedule, the participants weren't given time to discuss this further and it was framed more as a 'takeaway' question for them). After this, everyone was reminded to fill in the satisfaction questionnaire and the event was ended by thanking the audience, presenters, consortium partners and everyone who made it possible (Figure 16).

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**Figure 16 Conclusion of the symposium**

## 5 Symposium evaluation and analysis

This section focuses on the data generated pre, during and post the actual event. The data was analysed using different techniques and is presented here.

### 5.1 Reach and Impact

Before analysing the results of the satisfaction questionnaire, the registrations' information was briefly analysed to determine the reach and impact of the event and, subsequently, of the ADMIRE project. As this section looks to identify the Symposium's reach, the registrations were analysed since it is believed that even if some of the registrations did not actually attend the event, the fact that they entered the webpage and registered would imply that they would be familiar with the event and the project after the exercise.

Therefore, two data points were considered; "Country of residence" and "Where did you hear from us". It must be noted that because these weren't compulsory questions, there were some registrations that did not contain the required data but it was believed that enough data points were achieved to gain some insight into overall reach and impact of the event.

#### 5.1.1 Country of residence

When considering the first question, it is seen that 146 of the 188 registrants responded to it. It is believed that the dissemination strategies adopted were quite successful since the event attracted registrations from 28 countries across all 5 continents as shown in Figure 17.

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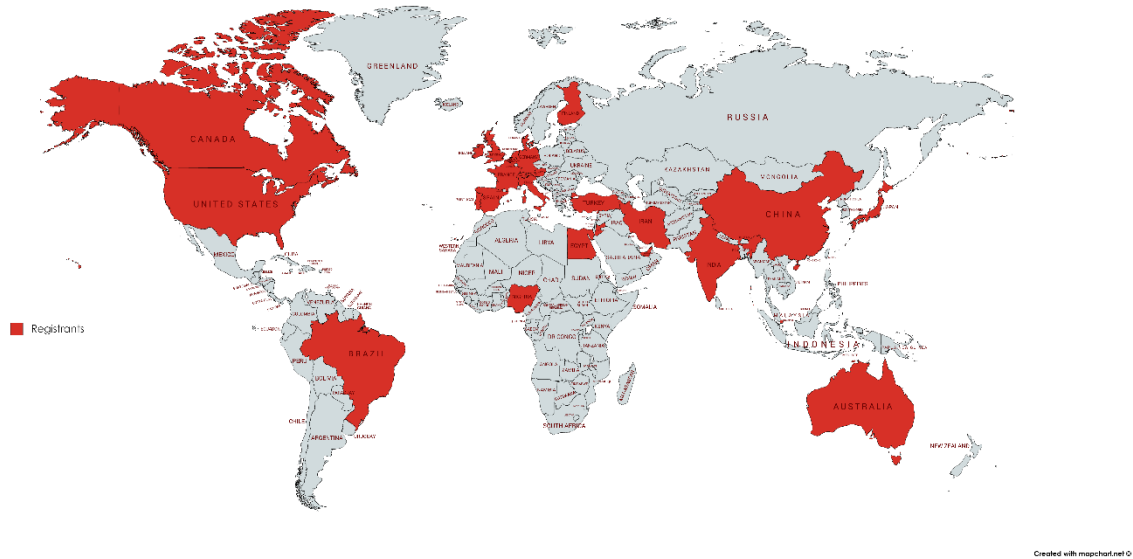


Figure 17 World map representing the registrations

Further, Table 2 also shows the countries with the 10 highest registrations and it is seen that the UK tops the list with 57 registrations with France (9 registrants) and India (7 registrants) occupying the top 3. The reason for UK’s dominance could be due to the marketing and networking routes adopted, which could be primarily centred on UK; these routes are explored in more detail in the next subsection.

Table 2 Countries with the 10 highest registrations

Country	Number of Registrations
United Kingdom	57
France	9
India	7
Spain	7
Belgium	7
Netherlands	6
Portugal	6
Germany	6
Ireland	5
United States	4

Nevertheless, it is seen that the reach of the event and hence, knowledge of ADMIRE was very wide, with registrations from various countries showing interest in the work done by the consortium.

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### 5.1.2 Marketing/Dissemination routes

As mentioned previously, the different marketing routes were determined to gain an insight on their effectiveness in communicating an event like this. Once again, because this was an optional question (“Where did you hear from us”) in the registration page, 116 out of the 188 registrants responded to the question. Additionally, because it was an open-ended question wherein the registrants were required to type their answer, there was a possibility of having different answers for the same entity. For example, a registrant could answer with just ‘Colleague’ or something specific like a name or ‘Friend’. Therefore, the available data was manually categorised into 7 classes based on the suitability of the actual answers.

Figure 18 shows the number of registrants from each of these 7 classes. As expected, the network through colleagues and emailing did fairly well with 36 registrations and 14 registrations through them respectively. Also communication from Cranfield University either through the intranet, tweet or university email accounted for 16 registrations (it must be noted that some of the answers could be in multiple classes, particularly emails from Cranfield; however if the registrants’ answer to this question contains any reference to the University, it was grouped under “Cranfield University”). But it is seen that the channel through LinkedIn was the most effective mode of dissemination thereby further proving the importance of using social media in events like these.

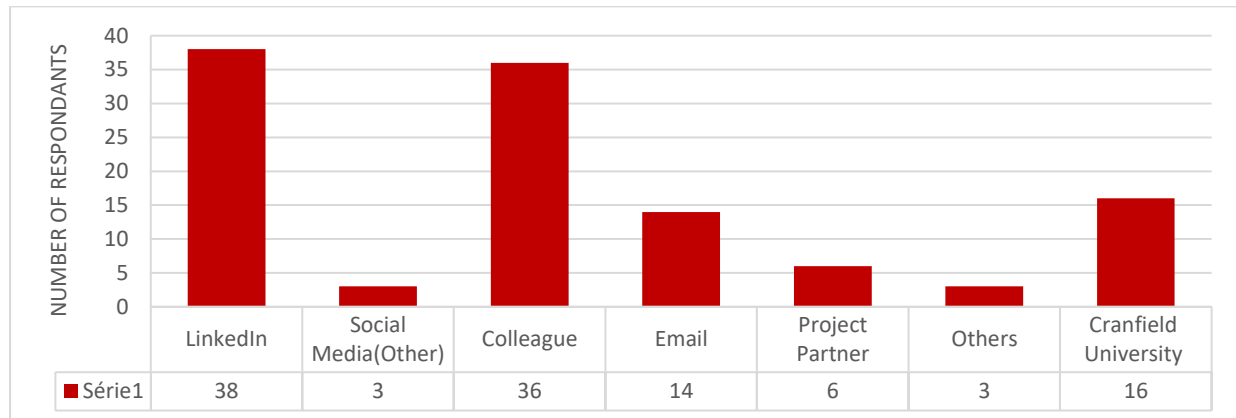


Figure 18 Number of registrants within each marketing route

Therefore, apart from utilising personal contacts and emails, the use of social media is highly recommended due to its ability to reach a vast and varied population very quickly. Additionally, it is believed that their design and construction would also target interested parties when, for example, hashtags are used.

### 5.2 ZOOM Polls

During the event, two online polls were carried out during the introduction and conclusion presentations. Apart from increasing engagement, the polls also generated data about the audience attending the event and their interests.

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### 5.2.1 Audience type

The first poll carried out during the introduction session asked the audience about their involvement in the AM field. They were given a choice between different areas of engagement including an option for people just interested about the field. Finally, the audience could choose multiple answers if it is applicable to them.

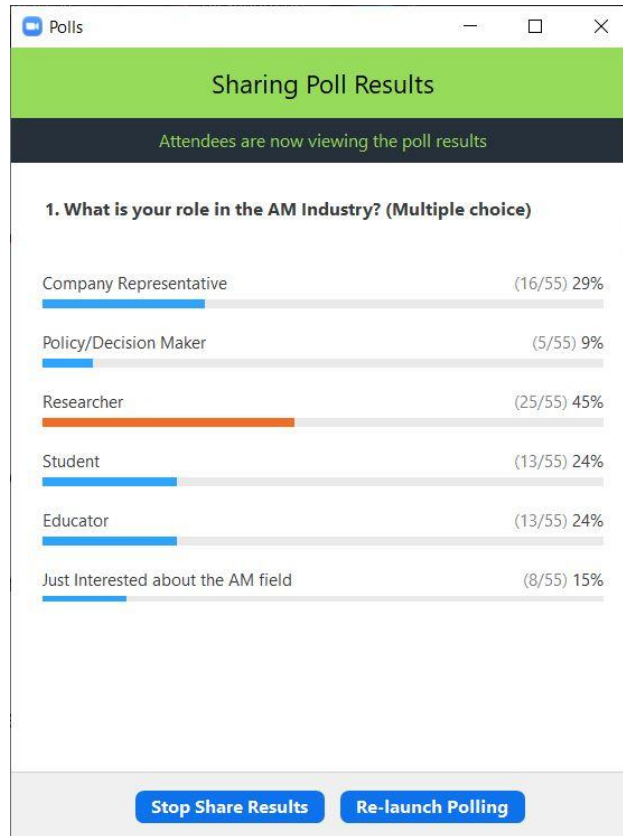


Figure 19 Introduction poll results

The results of this poll are shown in Figure 19. It is seen that there was representation from all the areas in the audience. Perhaps unsurprisingly (because the event was hosted by a university), the majority of the participants were involved in research (45%); however this is believed to be quite advantageous because research and education are symbiotic i.e. data and knowledge generated through research would be used to skill the next generation. The next category on the list were company representatives (29%) who are also thought to be critical to the field’s development. This was followed by an equal proportion of students (24%) and educators (24%). Finally, it was also important to note that the event also welcomed audience members who were just interested in knowing about AM (15%) and policy makers (9%).

Therefore, as mentioned previously, the Symposium had a varied audience from different arenas thereby feeding onto the earlier point (in the previous section) about its reach and impact. Also, apart from the dissemination of ADMIRE’s work, a diverse audience also

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contributed to auxiliary activities like the online chat, thereby making them more engaging and interesting.

### 5.2.2 ADMIRE’s results

The second and last poll carried out during the conclusion of the event asked the audience what aspect of ADMIRE interested them the most. Here they were given a choice between the three areas that were developed by the consortium. Once again, the participants were given the option to select multiple answers.

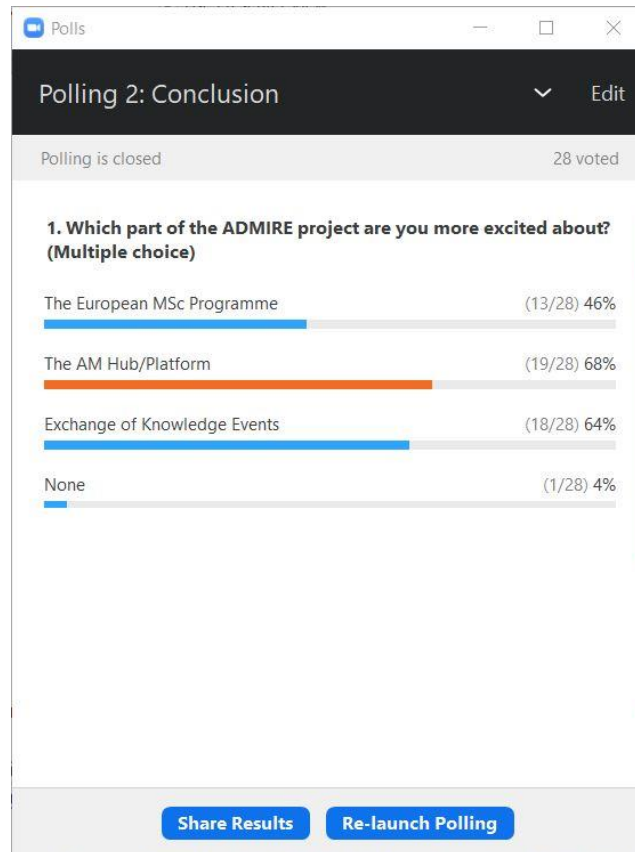


Figure 20 Conclusion poll results

As seen from Figure 20, the participants, in general, were excited about ADMIRE’s results with only 1 person voting none in the options. It is also seen that the AM Hub/Platform had the highest interest with 68% of the audience saying that there were excited by this feature. This was followed the exchange of knowledge events which excited 64% of the participants. Since these two aspects of ADMIRE had a more universal appeal with a lower level of time and resource commitment, they scored higher than the European MSc programme (46%). However, it is still thought that a score of 46% from a diverse audience (such as the one that attended the Symposium) is still relatively high for a full degree course with multiple modules, hence reflecting the importance of equipping the future players in AM with the right tools and knowledge.

Therefore, these results further prove the importance of the areas being considered by ADMIRE and their (high) interest amongst the different stakeholders in AM. This gives further credence to the work carried out by the consortium and their efforts.

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### 5.3 Satisfaction Questionnaire

After the event, all the participants were sent an online satisfaction questionnaire asking their opinion about the Symposium. It was believed that the results from this survey would help us gather an insight into the key elements of online events and would help design and develop similar future endeavours.

To assist with the analysis, the satisfaction questionnaire was broken up into themes and subtopics as shown in Figure 21. These themes and subtopics were subsequently analysed to gain insight into how each of the subtopics affected the overall satisfaction of the audience. In addition to these, there were also questions relating to the need for additional topics, interest in future events etc. that were considered as well.

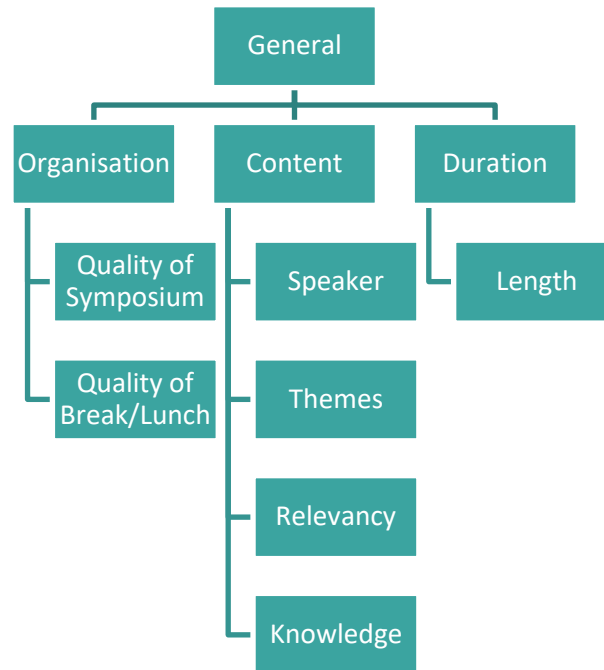


Figure 21 Themes of analysis

To proceed with the analysis, the data from the survey was also converted into a numerical value using the guide in Table 3; depending upon the question, the guide with ‘Answer I’ or ‘Answer II’ is followed since both answer types are needed for the subsequent analysis.

Table 3 Answer codesheet

Answer I	Answer II	Number
Very satisfied	Clearly yes	4
Satisfied	Rather yes	3
Dissatisfied	Rather no	2
Very dissatisfied	Clearly no	1

There were 29 respondents to the survey thereby reflecting a decent response rate. Initially it was thought to carry out statistical tests to determine the correlation coefficients between the

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overall event satisfaction and the different themes and subtopics. However, both Pearson (parametric) and Spearman (non-parametric) correlations did not show any statically significant results (Table 4 and Table 5 respectively) which meant that the null hypothesis of the parameters having no correlation between each other, could not be conclusively rejected.

Therefore, each theme/subtopic was analysed individually to understand how they were perceived during the event. After this, the responses were subjected to a repeated measures ANOVA to determine if the means of any of these responses were statically different. This would allow us to identify if any aspect of the Symposium performed above/below the norm.

**Table 4 Pearson Correlation**

		General	Symposium_Qlty	Break_Qlty	Speakers	Themes	Relevancy	Knowledge	Duration
General	Pearson Correlation	1	.306	.243	.346	.305	.189	.157	.053
	Sig. (2-tailed)		.106	.204	.066	.108	.325	.417	.783
	N	29	29	29	29	29	29	29	29

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed)

**Table 5 Spearman's rho**

		General	Symposium_Qlty	Break_Qlty	Speakers	Themes	Relevancy	Knowledge	Duration
General	Correlation Coefficient	1.000	.306	.179	.346	.305	.169	.138	.053
	Sig. (2-tailed)	.	.106	.353	.066	.108	.380	.476	.783
	N	29	29	29	29	29	29	29	29

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\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed)

### 5.3.1 Individual Analysis

The responses for each of the topic questions are explored individually in this section. To assist with the analysis, the means and standard deviations ( $\sigma$ ) for each of the topics are shown in Table 6. These results will be used alongside the analysis for additional insights.

**Table 6 Descriptive Statistics**

	Mean	Std. Deviation	N
General	3.4483	.50612	29
Symposium_Qlty	3.8966	.30993	29
Break_Qlty	3.2414	.83045	29
Speakers	3.7586	.43549	29
Themes	3.6897	.47082	29
Relevancy	3.6552	.55265	29
Knowledge	3.5172	.57450	29
Duration	3.5862	.50123	29

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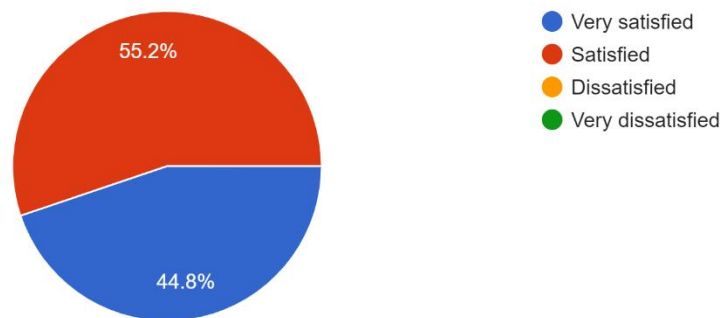
**5.3.1.1 General**

The first theme/question to consider was the general satisfaction of the Symposium. Of the 29 responses, 55.2% stated that they were ‘Satisfied’ and the remaining 44.8% said that they were ‘Very satisfied’ with the Symposium in general (Figure 22). There were no dissatisfied responses from the available sample size. This is also evidenced by the mean and  $\sigma$  scores in Table 6 which shows values of 3.45 and 0.506 respectively.

Based on their comments, it is believed that the respondents enjoyed presentations and the subjects being discussed, and the use of the chat function was also appreciated. Comments also stated the event was well organised and was collaborative. In terms of further improvement, there were certain suggestions on including more technical content and involving industrial partners during the actual master’s programme and training (the last part is thought to be unrelated directly to the Symposium but is nevertheless included for consideration during future course planning).

Nevertheless, it is believed that the Symposium was well received among the audience and it was generally a satisfactory to very satisfactory experience for them.

Overall, are you satisfied with the Symposium?  
29 responses



**Figure 22 General satisfaction**

**5.3.1.2 Organisation**

The organisation theme was further subdivided into quality of the Symposium and quality of break and lunch. As seen in Figure 23, the quality of the Symposium was highly rated, in fact it has the highest mean (3.90) with lowest standard deviation (0.310) amongst all the subtopics. Therefore, it is believed that the overall organisation of the event and the sessions were very well received by the respondents.

The next part of the event’s organisation dealt with the quality of the breaks and lunch. Here, it was seen that the satisfaction rates were lower; in fact, the mean value of 3.24 was the lowest amongst all the values and the standard deviation of 0.830 was the highest. This suggested that certain respondents were not very satisfied with the quality of the breaks; this is illustrated in Figure 23 wherein 1 respondent wasn’t satisfied and 2 weren’t clearly satisfied

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with the quality of break and lunch. To gain further insight, the comments from this section were analysed. It was seen that perhaps the main reason for the lower rating was due to there being no lunch break during the course of the Symposium. This was not included because the event was scheduled to run for half a day and hence, was concluded before lunchtime in the UK. However, it is recognised (as one of the comments pointed out) that the virtual nature of the session included participants from different time zones across the globe and hence clashes were inevitable. Nevertheless, it is believed that based on the feedback, a single break for the whole event was not adequate and more intervals must be included in future sessions.

How are you satisfied with...

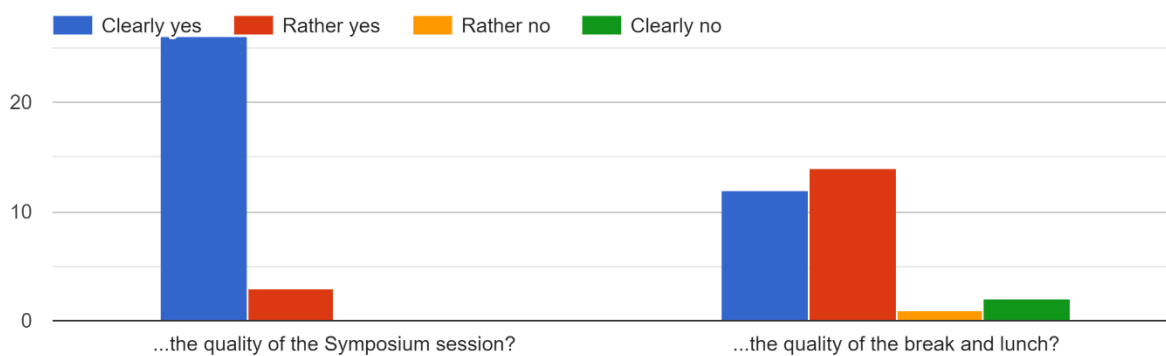


Figure 23 Organisational satisfaction

### 5.3.1.3 Content

As shown in Figure 21, the content of the Symposium was broken into speaker, themes, relevancy and knowledge. When considering the speakers, it is seen that the survey respondents were quite happy with 7 answering “rather yes” and 22 stating that they were clearly satisfied with the speakers (Figure 24). This was also reflected in the mean (3.76) and standard deviation (0.435) scores in Table 6, which were the second highest and second lowest (after Symposium quality). Therefore, it is thought that the speakers at the event were very well received by the majority of the audience.

The second question within the theme dealt with the themes of the session. This too had all the answers between “clearly satisfied” and “satisfied”, as shown in Figure 24, with 9 respondents stating they were satisfied and the remaining 20 stating that they were clearly satisfied. Once again the mean of 3.69 and standard deviation of 0.471 reflected the satisfaction rates of the subtopic. Although they were lower (in terms of the mean) compared to the speakers’ satisfaction, the value was believed to be high enough to state that the audience was very happy with the themes covered in the Symposium.

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The third subtopic within the content theme was the relevancy of the presentations and if they offered new/additional insights to the listener. Once again, as shown in Figure 24, most of the responses were clearly satisfied with this aspect (20), however there was 1 response that stated that the presentations weren't relevant and/or provide new insights (the remaining 8 answers were satisfied). However, the mean score of 3.66 was not much lower than the previous subtopic thereby suggesting a fairly satisfactory response. The standard deviation, however, was higher at 0.553 showing a wider spread of the responses.

The final subtopic within this theme asked the respondents if the talks increased the knowledge of the listeners in their subjects of interest. Although the number of respondents who were clearly satisfied were higher than the other options with 16, this gap was much closer than the previous subtopics within the theme as 12 respondents said "rather yes" when asked if they were satisfied (Figure 24). Once again, there was 1 response that did not gain any additional knowledge from the talks. The mean value of 3.52 was the lowest amongst all subtopics within this theme and the standard deviation of 0.575 was higher than average. It is believed that the main reason for the lower mean score was due to the fact that this event focused on teaching techniques and the AM community harmonisation rather than introducing a technical topic which would have contributed to the knowledge database and perhaps better met the audience expectations. Nevertheless, the mean score is still high enough i.e., >3, to suggest that multiple audience members did gain knowledge through the talks.

To understand why the last two subtopics of the theme had responses that were not satisfactory, the comments within the survey were examined. However, of the two comments received, one spoke about a potential collaboration and the other provided further advice on the master's course which although extremely valuable, did not provide us with enough insight to answer the initial question. But as mentioned before, the actual structure and content of the event would have lended itself less towards technical knowledge and perhaps the audience expectation of "knowledge". It is further thought that insights had a higher satisfaction rate than the knowledge because the audience might have associated the teaching and community harmonisation techniques developed/introduced by ADMIRE more as insights rather than new fundamental knowledge.

Do you agree with the following statements?

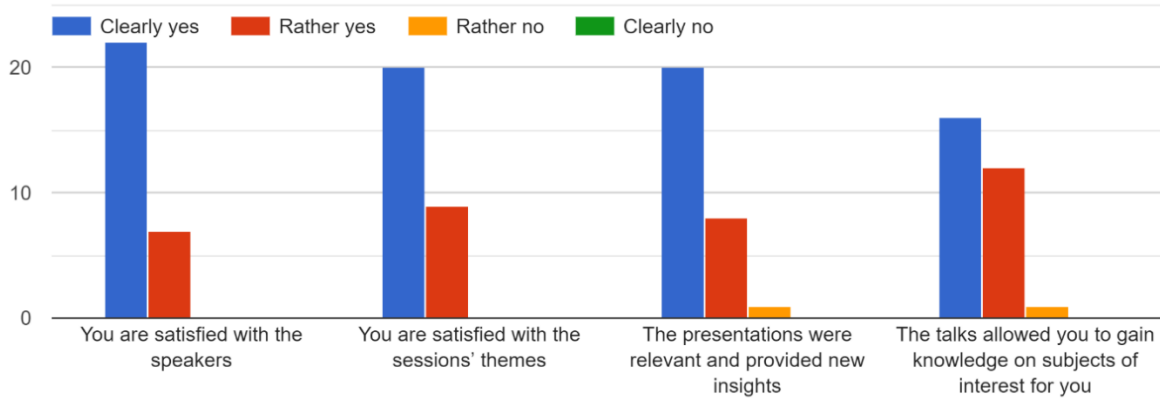


Figure 24 Content satisfaction

### 5.3.1.4 Duration

When asked about the duration of the event, 58.6% of the respondents were clearly satisfied and the remaining 41.4% were satisfied with the length of the Symposium, as shown in Figure 25. The follow up questions asked what the reason was for the duration being unsatisfactory (if it was believed to be so). Here, 2 participants responded (since it was an optional question) wherein one stated that it was too long and the other was of the opinion that it was too short. Nevertheless, from the initial results and the mean value calculated (3.59;  $\sigma = 0.501$ ), it is thought that the duration of the event was satisfactory and future endeavours similar to the present event are recommended to be of similar length. Nonetheless, as one of the comments pointed out, a physical Symposium can/should be longer to enable networking.

Are you satisfied with the Symposium's duration?

29 responses

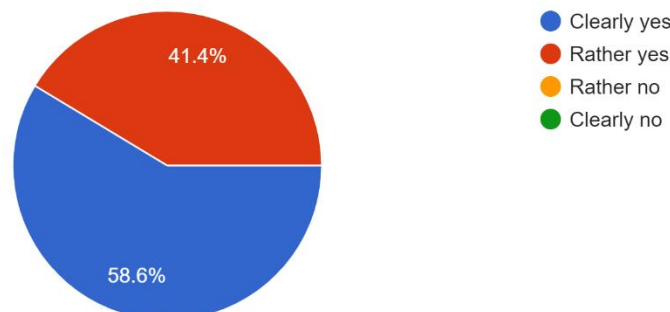


Figure 25 Duration satisfaction

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### 5.3.1.5 Additional information

In addition to the information already requested, the respondents were asked for their opinion on auxiliary topics as presented subsequently.

The first of these questions asked the participants if they would have liked any other topics covered wherein 69% said *no* (Figure 26). The remaining 31%, who answered *yes* were also asked what topics they would be interested in. Amongst the responses, some of the suggestions included the inclusion of more guest speakers (from the industry as well), a live demonstration of the online AM Hub/Platform and AM techniques other than WAAM. There were also suggestions of including more technical content, but it is thought that this was out of the event's scope and could not be justified with the time constraint.

Are there any other topics that you would have liked to be covered?

29 responses

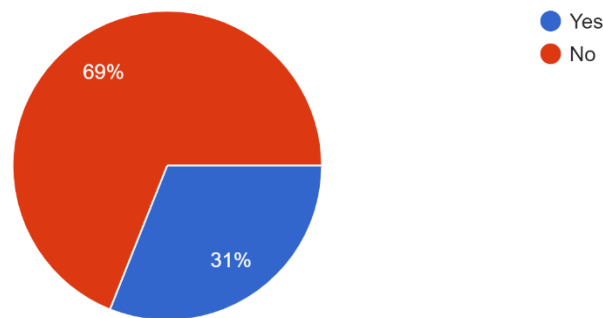


Figure 26 Additional topics

The second auxiliary question wanted to know if the respondents would be interested in attending future events. This is believed to be an important aspect because it is critical that apart from introducing new groups, an event should also attract previous participants. Without the audience coming back, further growth of the event (and hence, the topic) would not be possible and it will not be a sustainable venture. Therefore the response to this questions was collected and as shown in Figure 27, 81.5% of the respondents said that they would return for a future ADMIRE event. This translated to the fact that this event was successful and future events within the same topics would be sustainable if feedback was collected and continuously improved upon.

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Would you be interested in participating on future ADMIRE events, such as ADMIRE Final Conference? If yes, please provide your email contact

27 responses

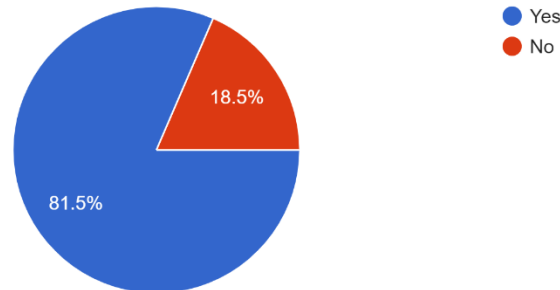


Figure 27 Future attendance

Finally, the survey asked about the primary reason for attending the event and as seen in Figure 28 the majority (80.8%) of the responses said that they were there to obtain/share information. This is also believed to provide further information towards planning a similar event in the future since the expectations of the participants are better known.

Main reason for attending the event?

26 responses

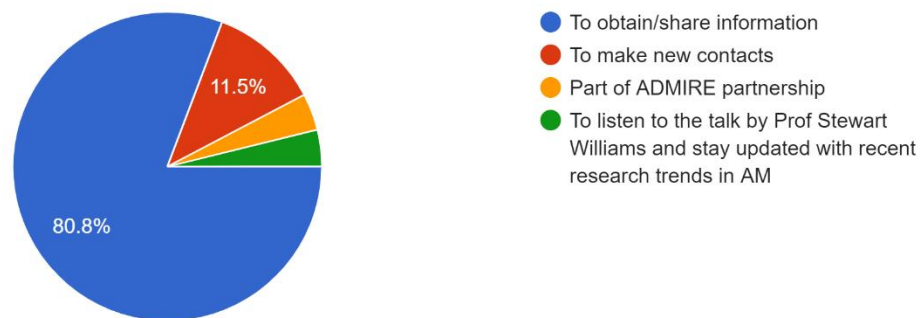


Figure 28 Reasons for attending the event

Overall, from all the results and mean values, it is thought that the Symposium was very satisfactory to the audience. None of the mean satisfactory values are below 3.24 which shows that the Symposium was very well received by the attendees. In fact, the majority (81.5%) of the respondents also said that they would attend future ADMIRE events, thereby providing further evidence to the Symposium's success. However, there are some lessons learnt which might improve the experience of future events; this includes scheduling of additional breaks

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and perhaps having an additional presentation from a representative from the industrial partners.

### 5.3.2 ANOVA

Another test that was considered was the Analysis of Variance (ANOVA), this is used to test if the means of the scores for each subtheme are statistically different thereby allowing us to gain insight on which attribute of the symposium as above or below the norm.

One major concern with using Likert-type data similar to the data from our survey on parametric tests is the data type. Authors in the literature [7][8] argue that the ordinal data generated by these surveys would require the use of non-parametric tests however there is a growing trend that seems to suggest the use of parametric tests is okay [9][10]. Indeed, Norman [11] states (and shows) that parametric tests are robust enough to work with Likert-type (ordinal) data and also account for its non-normality, lower sample size and unequal variances. Additionally, non-parametric tests are less powerful thereby by requiring larger sample sizes to identify any potential difference [10].

Therefore although the present data is from a Likert scale, not normally distributed i.e., does not satisfy the Shapiro-Wilk test of normality and have outliers present, it was still used in the ANOVA test due to the latter’s robustness. In terms of the outliers, even though they could have been rectified by adopting the next best value or even eliminating the current value altogether, they were retained as they were due to them not being very far from required range.

To carry out the test, a repeated measures ANOVA was carried out in IBM SPSS Statistics 26 as all the themes had the same sample (people) responding. In addition to the actual ANOVA, the estimated marginal means using the LSD adjustment.

Before proceeding with results, the sphericity of the data set is checked using Mauchly’s Test of Sphericity which tests for the population variances. From the results, it was seen that Sig.<0.05, hence Sphericity cannot be assumed. Therefore, for the present case the Greenhouse-Geisser correction (epsilon = 0.508) will be used subsequently.

To determine if the means of any our means are different, we will used the table for tests of within-subjects and consider the results under ‘Greenhouse-Geisser’ as shown in Table 7. The results show that Sig.=0.002 which, is less than 0.05; therefore we can reject the null hypothesis (which states that the means are all equal) and states that at least one of the means from the subtopic responses is different [F(3.56,99.59) = 4.95].

**Table 7 Tests of Within-Subjects Effects**

Measure: Satisfaction

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Theme	Sphericity Assumed	8.203	7	1.172	4.947	.000	.150
	Greenhouse-Geisser	8.203	3.557	2.306	4.947	.002	.150
	Huynh-Feldt	8.203	4.138	1.982	4.947	.001	.150
	Lower-bound	8.203	1.000	8.203	4.947	.034	.150

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Error(Theme)	Sphericity Assumed	46.422	196	.237		
	Greenhouse-Geisser	46.422	99.586	.466		
	Huynh-Feldt	46.422	115.859	.401		
	Lower-bound	46.422	28.000	1.658		

To gain further insight into which of the means is different, we use the results from pairwise comparisons in the estimated marginal means given in . The group means which are statistically different are shown in bold in the table. For the present dataset, the general Symposium satisfaction is used as the control and the other means are measured in relation to this. It is believed that this would allow us to understand which of the mean subtopic responses were different to the mean overall Symposium satisfaction. Therefore, from the results, it is seen that the means of groups 1 & 2 and groups 1 & 4 are less than or equal to 0.05 which implies that they are statistically different. It must be noted here that although the results show other statistically different mean comparisons, we are only considering the results of means with relation to group 1 since that is our control and therefore, only these are shown in .

For our results, it implies that the mean response Symposium quality and the speaker satisfaction are statistically different to the overall (general) satisfaction mean. This is further explored in Figure 29 which shows this difference visually. In addition, the image also shows that the Symposium quality and speaker satisfactions scores were above the general Symposium satisfaction. Table 7 also gives us the value of partial Eta squared (0.15) which means that 15% of the mean variance is due to the theme choice. Although this value is not large, we can say that the theme has a non-negligible effect (15%) on the satisfaction scores in our sample.

Hence it can be concluded that the ANOVA and the subsequent pairwise comparisons showed that two of the themes/subtopics of Symposium quality and speaker satisfaction had a statistically different mean that was higher than the mean general event satisfaction. As an extension, it is believed that these two aspects were the symposium’s highlights.

**Table 8 Pairwise Comparisons**

Measure: Satisfaction

(I) Theme	(J) Theme	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
1	2	-.448*	.094	.000	-.641	-.256
	3	.207	.160	.206	-.121	.534
	4	-.310*	.101	.005	-.516	-.104
	5	-.241*	.107	.032	-.461	-.022
	6	-.207	.125	.110	-.464	.050
	7	-.069	.131	.602	-.337	.199
	8	-.138	.129	.293	-.402	.126

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

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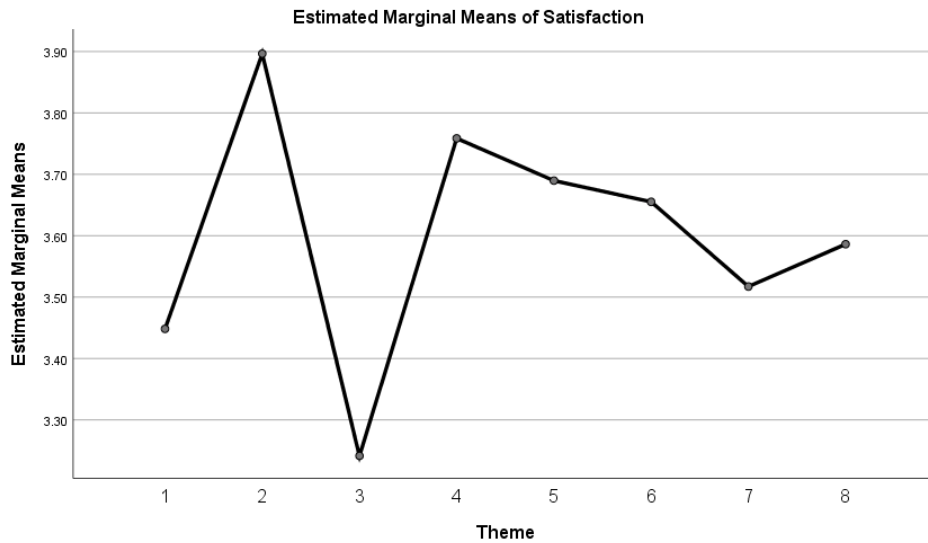


Figure 29 Estimated marginal means of the different themes/subtopics

## 6 Conclusions

The present report detailed the efforts undertaken by the consortium in organising the ADMIRE AM Symposium 2020 in response to the impossibility of holding ADMIRE Final Conference, in a face-to-face session, due to the COVID-19 pandemic. This event was conducted virtually using ZOOM and had registrants and participants from across the globe. The event itself saw the presentation of the project’s objectives and the different methods used to achieve them, including a pilot of the European Metal AM MSc programme and an AM Hub/Platform that would better connect the different actors within the sector.

After the event, an online satisfaction questionnaire was circulated to all the participants and based on the received responses, certain insights into the event’s organisation were gained. The responses were analysed individually for each specific question in the survey and also using the ANOVA test to identify any significant differences. Due to the relatively low response rate of the survey, further quantitative tests (such as correlation) could not be effectively performed. Nevertheless, from the analysis carried out, it was seen that the Symposium was well received amongst the respondents with all of the answers’ means being greater than 3.24/4. From the ANOVA results, it was seen that the satisfaction of Symposium’s quality and the speakers were significantly higher than the overall mean, thereby suggesting that these were the two standout attributes of the event. On the flipside and from the survey results, it is believed that the breaks during the Symposium need to be increased and there should have also been a speaker from the AM industry to provide another perspective. These insights will need to be incorporated whilst planning similar future endeavours.

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**TITLE:** WP 7: Dissemination and Exploitation of Results

**Subject/Deliverable:** D 7.8 ADMIRE Final Conference



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## 7 ADMIRE Final Conference

### 7.1 Introduction

**ADMIRE Final Conference | Skilling the AM Future 2020** was another online event held on the 15<sup>th</sup> of October, 2020, following the extension of ADMIRE implementation period. This event built on the themes of the ADMIRE AM Symposium and focused on the European MSc as its primary theme. Once again, this was a half a day event with breaks and interactions throughout.

This section of the report details the planning and execution of the ADMIRE final conference starting with the event conceptualisation and the agenda. This is followed by the event and registration pages used for the event. After this, the dissemination of the event and the registrations are presented. As with the ADMIRE AM Symposium described earlier in the report, the presentations during the day are also briefly discussed here. Finally, the results of the audience polls and feedback are analysed for the benefit of future events.

APPENDIX II shows the screenshots taken during the event.

### 7.2 Event conceptualisation

Once again due to the COVID-19 pandemic, the event was held online using the ZOOM platform. The case for an online event was further supported by the level of participation and engagement that was seen during the ADMIRE AM Symposium. The thinking behind a half day event is explained in more detail in section 2 and a similar format to the ADMIRE AM Symposium was adopted for this event as well. However, a couple of changes were implemented based on the participant's feedback, collected in the ADMIRE AM Symposium.

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The first of these included the scheduling of an additional break whose need was identified during the AM Symposium's feedback. Next, because the AM Symposium featured a guest talk from Prof Stewart Williams who offered a clear insight on the need for AM education from an academic perspective, ADMIRE Final Conference invited Dr Martin White who is the Head of AM programmes- Europe, ASTM, to talk about the need of bringing education and industry closer and offer an industrial perspective to compliment the academic outlook; this was also one of the points received during the feedback of the symposium. The organising committee were delighted that Dr White accepted our invitation and agreed to be the keynote speaker.

Once salient points of the event were agreed upon, an agenda was drawn, and the webpage launched for the registrations.

### 7.3 Invitation and agenda

Cranfield University and EWF worked together to launch the event web and registration page on Eventbrite (<https://www.eventbrite.co.uk/e/admire-final-conference-skilling-the-am-future-2020-tickets-122395043871#>).

The event was held as part of the Erasmus Days 2020 initiative. In an effort to increase its profile and visibility, EWF registered ADMIRE Final Conference on Erasmus Days 2020 platform, connected to the Portuguese National Agency:



Figure 30 Registration confirmation from the Portuguese Erasmus National Agency

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Figure 31 Reference to ADMIRE Final Conference | Skilling the AM Future 2020 on ErasmusDays2020 Platform

### 7.3.1 Agenda

The agenda for the ADMIRE Final Conference is shown in Figure 32. Not unlike the Symposium, the sessions were limited in duration for reasons previously identified in section 3.1. Due to the number of topics covered and the duration of the event, each session was limited to 15-30 mins.

A more detailed explanation of the World Café meeting carried out is given later, but to assist with this part of the event, the breakout rooms option in ZOOM was utilised. Finally because of the success of the polls and the chat features during the AM Symposium, these were carried over to increase audience interaction and improve their experience.

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**ADMIRE Final Conference | Skilling the AM Future 2020**

**October 15<sup>th</sup>, 2020 (Online Session)**

09.00 am – 01.00 pm (WET)

**Agenda**

Time	Activities
09.00 to 09.15	Welcome to ADMIRE Final Conference <b>Surya Krishnaswamy – Cranfield University</b>
09.15 to 09.45	Introduction to ADMIRE project <b>Susana Nogueira- EWF</b>
09.45 to 10.15	The new European Metal AM Engineer MSc: Curriculum and Implementation <b>Susana Nogueira – EWF</b>
10.15 to 10.35	Skilling the AM Future: Contributions from ADMIRE and SAM projects <b>Adelaide Almeida - EWF</b>
10.35 to 10.45	<b>Break</b>
10.45 to 11.15	Participating on the European Metal AM Engineer MSc pilots: Testimonies from Students/Teaching Staff <b>Surya Krishnaswamy – Cranfield University</b>
11.15 to 11.45	The importance of bringing Education & Industry closer (from Industry point of view) <b>Martin White - Head of Additive Manufacturing Programs – Europe/ASTM</b>
11.45 to 12.00	<b>Break</b>
12.00 to 12.30	AM World Cafe meeting ( <i>Sustainability and Exploitation of ADMIRE Results</i> ) <b>(Moderated by ADMIRE Partners)</b>
12.30 to 12.45	Main results from the AM World Café meeting <b>(Main Moderator of each Room)</b>
12.45 to 13.00	Wrap up and conclusion <b>Surya Krishnaswamy – Cranfield University</b>



In Partnership with:



Figure 32 ADMIRE Final Conference agenda

**7.3.2 Web and Registration page**

Figure 33 shows the event landing page for the ADMIRE Final Conference. Apart from redirecting the viewers to registration, the page also contains the details of the event such as the date and time and, a brief description which detailed its themes and topics.

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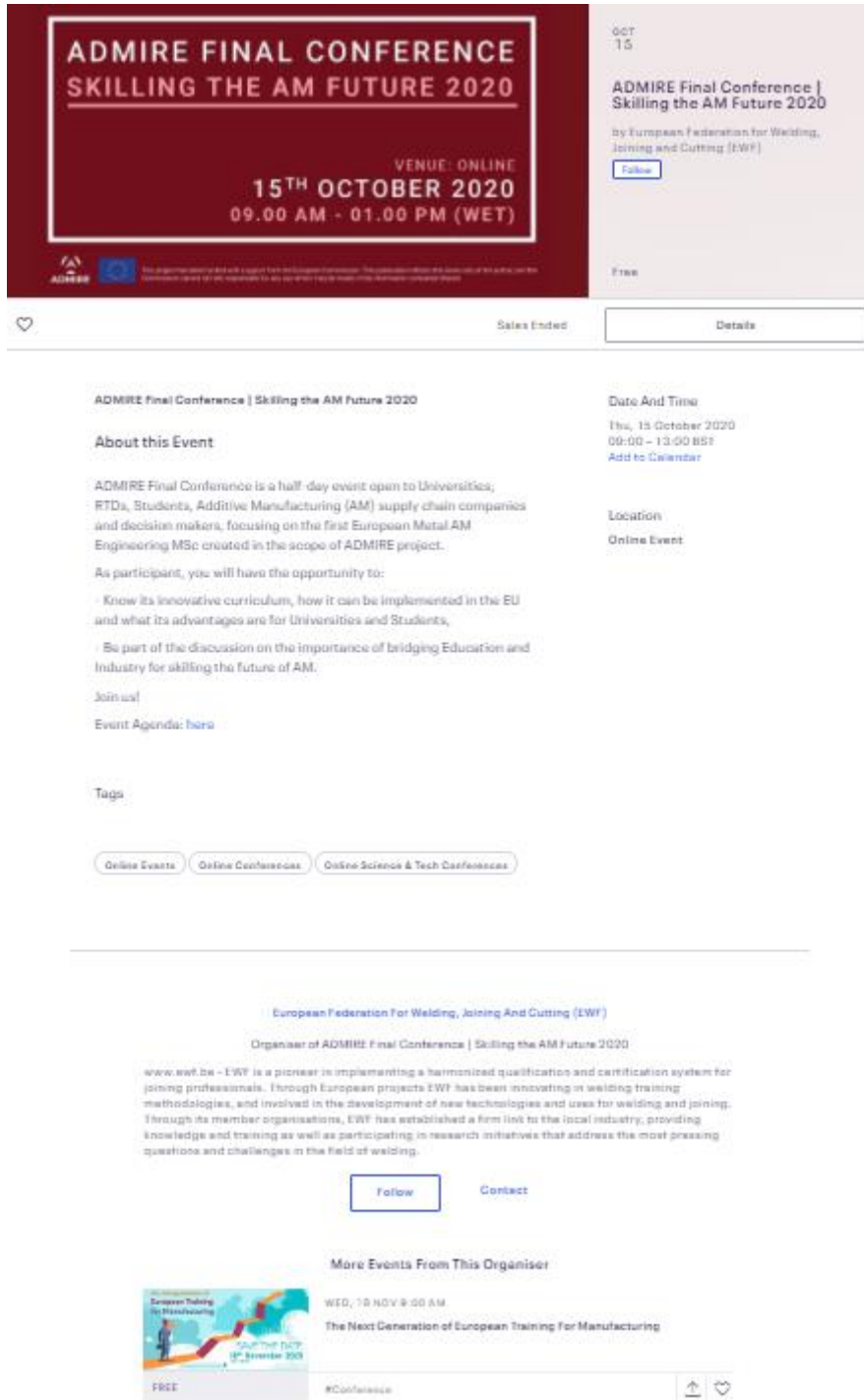


Figure 33 Event page for the ADMIRE final conference

Once the participants registered, they received a mail from Eventbrite confirming their registration, as shown in Figure 34. This mail confirmed the registrant's order and also showed the event's date and time for their reference.

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Figure 34 Registration confirmation

### 7.3.3 Dissemination and Impact

To help share the event to potential participants, various dissemination strategies were adopted. Once again, as mentioned previously, only Cranfield University's strategies are detailed below (the strategies of other partners can be found in the ADMIRE deliverable 7.5 *Dissemination Portfolio*), as partner responsible for organising the event and for elaborating this document.

Figure 35 shows the LinkedIn post of ADMIRE's representative at Cranfield University; this post had 841 views. Additionally, Cranfield University shared the details of the Conference on their official LinkedIn (Figure 36) and Twitter (Figure 37) accounts which boasted 77,680 and 23.6K followers respectively. In addition to these, an internal email (by EWF) was also circulated to all the partners to attend as well as spread the event around using their network.

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Hello Everyone,  
Over the last year or so, I was fortunate enough to be involved in an [#erasmusplus](#) project, [#ADMIRE](#) (<https://admireproject.eu/>). This project primarily considered the skills gap between academia and industry and, looked to reduce it. Therefore, one of the areas we worked on was the development of a [#masters](#) programme for [#additivemanufacturing](#).  
Since this project is coming to an end, we have decided to have one final [#conference](#) next week on 15/10/2020. Please do visit the link below and register for the event if you are interested in the masters programme or the project in general. Apart from getting to know about ADMIRE, there could also an opportunity to connect with people of a similar disposition.

<https://lnkd.in/dvSZifm>

This event is also part of the Erasmus days event by EWF (<https://lnkd.in/dnipmTJ>)

[#3dprinting](#) [#education](#) [#webinar](#)



Figure 35 LinkedIn post by the ADMIRE representative at Cranfield



Figure 36 LinkedIn post by Cranfield University

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**Figure 37 Twitter post by Cranfield University**

## 7.4 Presentations

The different presentations of the ADMIRE Final Conference are described here. As with the ADMIRE Symposium, each session had a speaker and a handler (to manage the auxiliary tasks). Once again, the speakers agreed to act as handlers in sessions they weren't leading to make the process more efficient.

### 7.4.1 Introduction

Initially, all the participants (a total of 28) were welcomed as shown in Figure 38. Apart from a very brief introduction to ADMIRE and its scope, there was also an icebreaker session where the audience were asked what their role in AM was (similar to the ADMIRE Symposium). The results from this poll are presented in the subsequent section. Then the agenda for the day was presented and explained, followed by a request for everyone to participate and make the whole event more enjoyable and a knowledgeable experience. The participants were also advised that screenshots would be taken during the event and a blurred copy would be included in the report.

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Figure 38 Introduction to the ADMIRE final conference

### 7.4.2 ADMIRE Project

After the introduction, the project manager of ADMIRE gave the participants a more detailed outlook of the project including its scope (Figure 39) of bridging the gap between industry and academia for AM. The presentation also spoke about the various strategies developed to achieve the project’s aim and objectives, including the creation of the European Metal AM Master’s course on Process Engineering, the AM Hub/Platform and the organisation of knowledge exchange events (AM World Cafe meetings and Knowledge “Speed-Datings”). The presentation ended with a list of advantages offered to ADMIRE target groups.

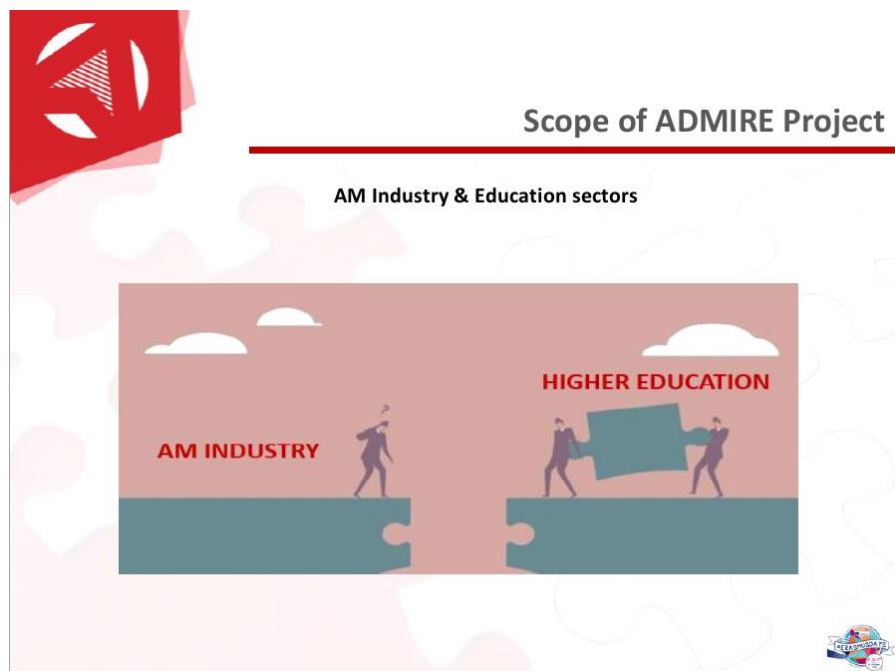


Figure 39 ADMIRE project's scope

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### 7.4.3 The new European Metal AM Engineer MSc

Because one of the key themes of this event was the European Metal AM MSc, a separate presentation on this topic was included. Once again, the project manager of ADMIRE presented the salient features of this course as shown in Figure 40. This section of the event also covered the initial curriculum, with its various modules that were offered during the pilot runs and the resultant feedback. The final curriculum, along with the specialisations/professional profiles, were also presented along with how they will be implemented in the future.



Figure 40 Initial European Metal AM MSc curriculum (piloted)

### 7.4.4 Skilling the AM Future

Although ADMIRE maybe coming to an end, the idea of skilling would not cease to exist. In fact, the results of ADMIRE are connected to another Erasmus+ funded project (Sector Skills Strategy in AM - SAM<sup>1</sup>) that is contributing for the sustainability of the work of the ADMIRE consortium by fostering the update of the European Metal AM Engineer MSc/specializations and the AM Hub/Platform (as fully detailed on deliverable D7.4 Dissemination, Sustainability and Exploitation Plan). Therefore, the project manager for SAM project was invited to present a brief introduction and the link between the two projects to the audience. The presentation also explored SAM's approach to tackle the skills need using the International AM Qualification System (IAMQS) and the AM Observatory (to which both ADMIRE results mentioned above will be connected). Finally, the latest findings of the project was also shared to the audience.

<sup>1</sup> <http://www.skills4am.eu/>

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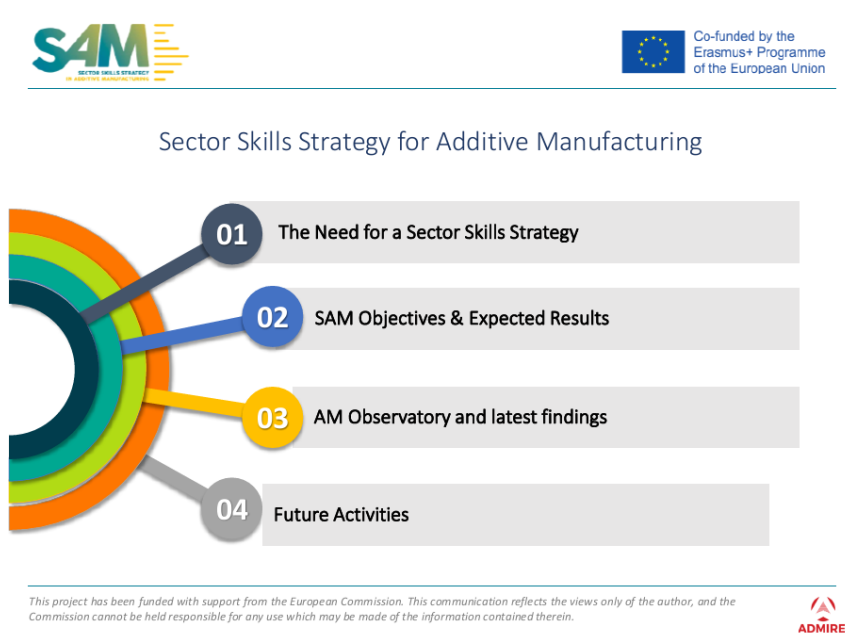


Figure 41 Skilling the AM future: SAM

#### 7.4.5 Testimonies from Staff and Students

In this part of the Final Conference, one student and two staff members from the pilots in Cranfield University offered their testimonies about the course to the audience. Firstly, the course director of the pilots presented their feedback. This was followed by another staff member who was also a module leader for multiple modules in the course and finally, one of the students who attended the pilots provided the audience with their experience.

Since this was mainly face-to-face feedback, there were no slides that could be included here.

#### 7.4.6 Guest Lecture

After the testimonies, the event had a guest talk from Dr Martin White, who is the head of AM programmes - Europe, at ASTM. The main purpose of Dr White's talk was the importance of bringing education and industry closer (Figure 42). The talk also touched on the various activities carried out by ASTM to reduce this gap including the creation of standards, work committees and collaborations. The need and activities of the ASTM AM centre of excellence was also presented during the talk.

The guest lecture was extremely insightful and provided valuable information on how to potentially reduce the skills gap from the industry and standards organisation's perspective. It was also believed that the event's audience greatly enjoyed the presentation due to high levels of engagement, particularly during the Q&A session at the end.

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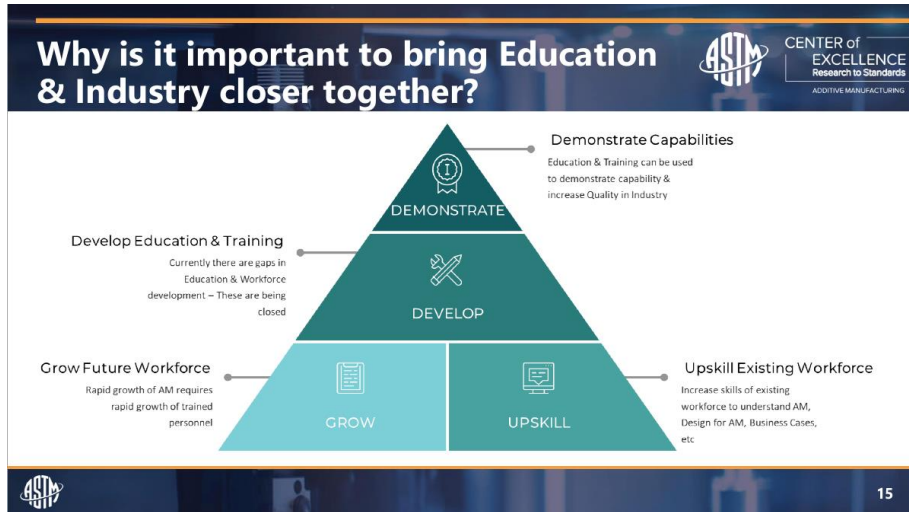


Figure 42 ADMIRE final conference guest lecture: The need for bringing Education and Industry closer together

### 7.4.7 AM World Café- Discussion and results

A more detailed analysis of the AM world café along with its methodology, results and analysis is given in another ADMIRE report. Therefore, the topic is only dealt with in brief within the present report.

Initially, the participants were explained the how the session would work and the questions that were to be discussed posted (Figure 43). Then everyone was divided into two breakout rooms wherein these questions were discussed. To aid with the discussion, each room had a moderator (a member of the ADMIRE consortium) that guided the discussion and each room had a fixed number of admire partners to help as well; the moderator and the other members' room allocation was decided before the event.

Once the participants had provided their inputs and discussed the questions, the moderators were invited to present the main points in the main room for the benefit of the other listeners.

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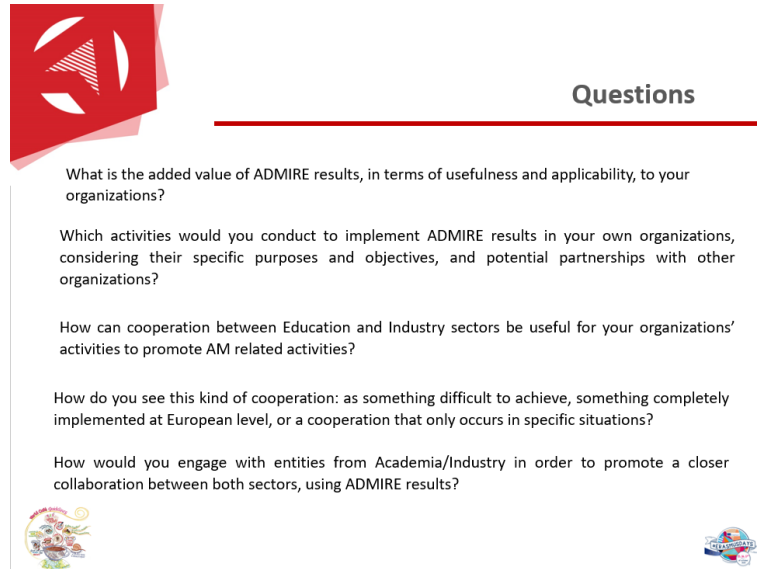


Figure 43 AM World Cafe questions

### 7.4.8 Conclusion

After the world cafe, the audience were kindly reminded to fill in the satisfaction questionnaire. Finally everyone; the audience, Dr White, the presenters and the participants were all thanked for their attention and the event was ended.

## 7.5 Symposium evaluation and analysis

This section details all the extra information collected before, during and after the conference. This includes areas such as the registrations, participants and results from the polls.

### 7.5.1 Registration and participation

The registration for the event was closed the day before it was due to take place and it was seen that a total of 61 participants registered for the event and expressed their interested in attending.

During the day of the event, at one point, there were 28 attendees; thereby giving us a participant to registrant ratio of 0.46 which is close to half. It is believed that this is a good return taking into account the event was held online and live which may not have suited all the time zones. Nevertheless it is thought that the number of participants should have been higher particularly when comparing it to the numbers achieved during the ADMIRE AM Symposium. The major reason for this could be down to the lower levels of engagement and dissemination which is thought to be due to the academic instructions being busy with novel teaching preparations and arrangements (due to the COVID-19 pandemic) which could have clashed with their schedules and hampered the marketing of the event. However, the amount of engagement and participation by the attendees of the ADMIRE final conference was a positive point and greatly contributed to the success of the event.

### 7.5.2 Audience Polls

During the conference, three different polls were posted to the audience throughout the duration of the event and their results are presented and discussed here. It must be noted that for the first two polls the audience were allowed to choose more than one option if they felt multiple answers applied.

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The first poll asked the audience what their role in AM was. This was similar to the question asked during the ADMIRE Symposium and the reason for repeating it once more was to ascertain if the audiences between the two events were similar. Figure 44 shows the results from this poll; it is seen that, similar to the Symposium, with 42% of the attendees being researchers it was the most represented category (the symposium had 45%, also being the most represented). However the percentage of educators increased from 24% at the symposium to 42% at the final conference thereby showing a positive trend since events such as these should attract and encourage the educators to participate as well. Apart from that the remaining groups showed similar percentages across the two events. It is also nice to note that 25% of the attendees were “just interested in the field” showing the importance of events like these in attracting new stakeholders from different areas.

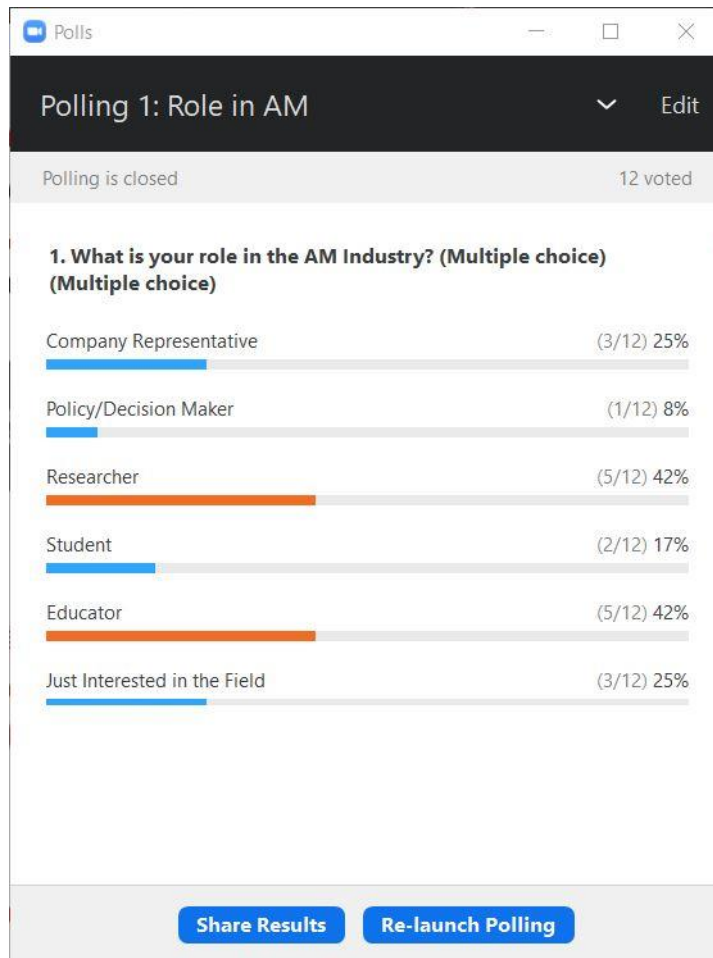
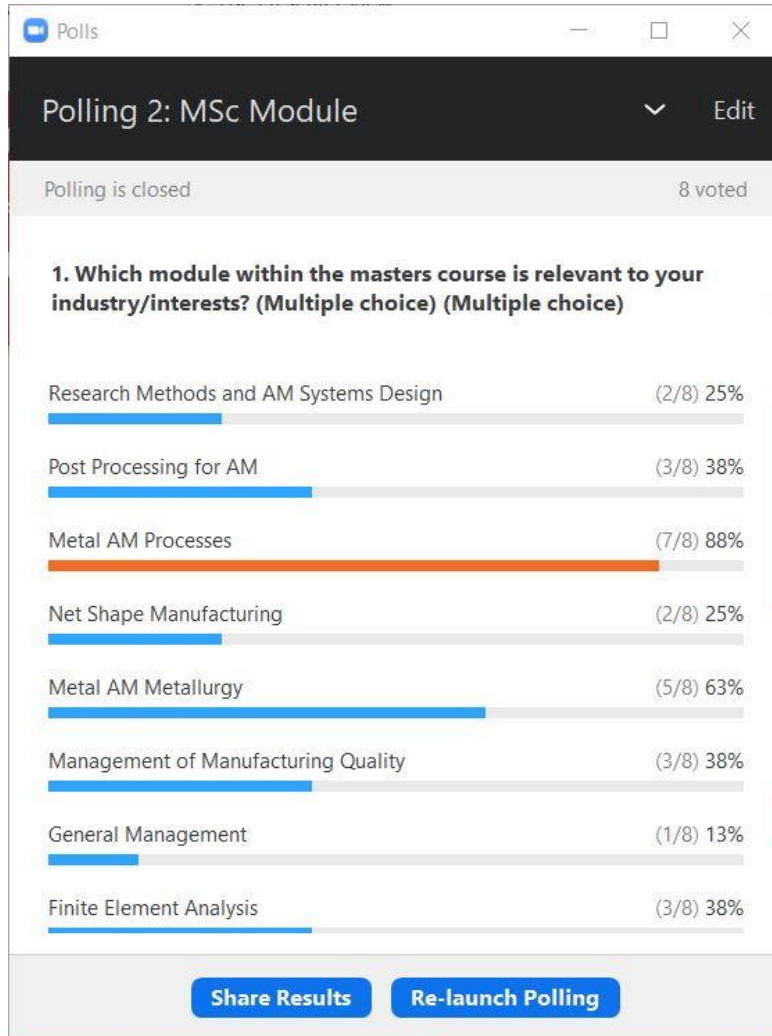


Figure 44 Roll in AM

The second poll of the final conference asked the audience about the different modules piloted by the European MSc and which one they thought was relevant their industry/interests.

As seen in Figure 45, two courses scored higher than most across the board- Metal AM Processes (88%) and Metal AM Metallurgy (63%) thereby signifying the importance of these courses and the need to constantly update their curriculum. On the other hand, general management attracted the least amount of interest. This module was also discussed in during the cluster meetings and pilot satisfaction questionnaires, therefore further details on why this could be and various strategies to improve the module content and public perception is discussed in that ADMIRE report.

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**Figure 45 MSc modules**

The final poll during the conference asked the audience about the region from which they were attending the event; this was to gain some insight into the geographic spread of the event. As seen from the results of the poll in Figure 46, the audience was made up of representatives from Europe and Asia with Europe accounting for 75% of the votes; this is once again, though to be due to the time zone and its convenience to European attendees since it was held according to BST. Nevertheless, unlike the Symposium which attracted a much wider range of audience, the final conference failed to attract participants from other regions of the world linking again, to the need for a more comprehensive dissemination strategy.

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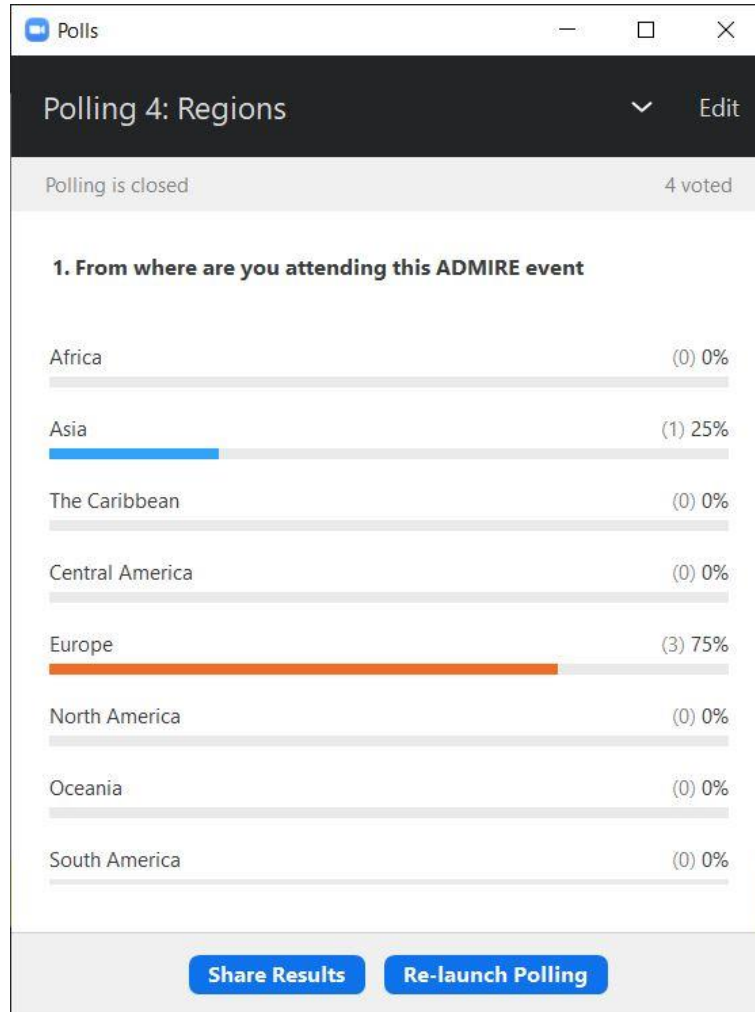


Figure 46 Audience location

### 7.5.3 Satisfaction questionnaire

The results of the satisfaction questionnaire are discussed in another ADMIRE report and are therefore, out of the scope of the present work.

## 7.6 Conclusion

This part of the report detailed the efforts and methodology of the ADMIRE Final Conference: Skilling the AM Future. Apart from presenting the audience with the work of the ADMIRE consortium, the continuation of their work through the SAM project, testimonies from staff and student and a guest lecture by Dr White on the importance of bringing education and industry closer together, the event also held an AM world café and presented its results.

Throughout the event various polls were held and their results presented and discussed here. Perhaps the biggest lesson learnt was the need to schedule similar events at the right time of the year; any events run during the start of the academic year run the risk of being neglected due to the higher priority activities involving teaching and student support. Additionally, academic staff may not have time in their schedules to even attend such events and provide their valuable insights. On the other hand, the AM process and metallurgy modules were shown to be relevant to the industry and their importance further confirmed. Therefore, overall, The data contained in this document contains proprietary information and it may not be copied or communicated to a third party or used for any other purpose than that which it was supplied without the ADMIRE consortium's prior written consent.

it is believed that the ADMIRE final conference was a successful event in terms of disseminating the results of the ADMIRE consortium and gaining further insights on the skills gap reduction between industry and academia.

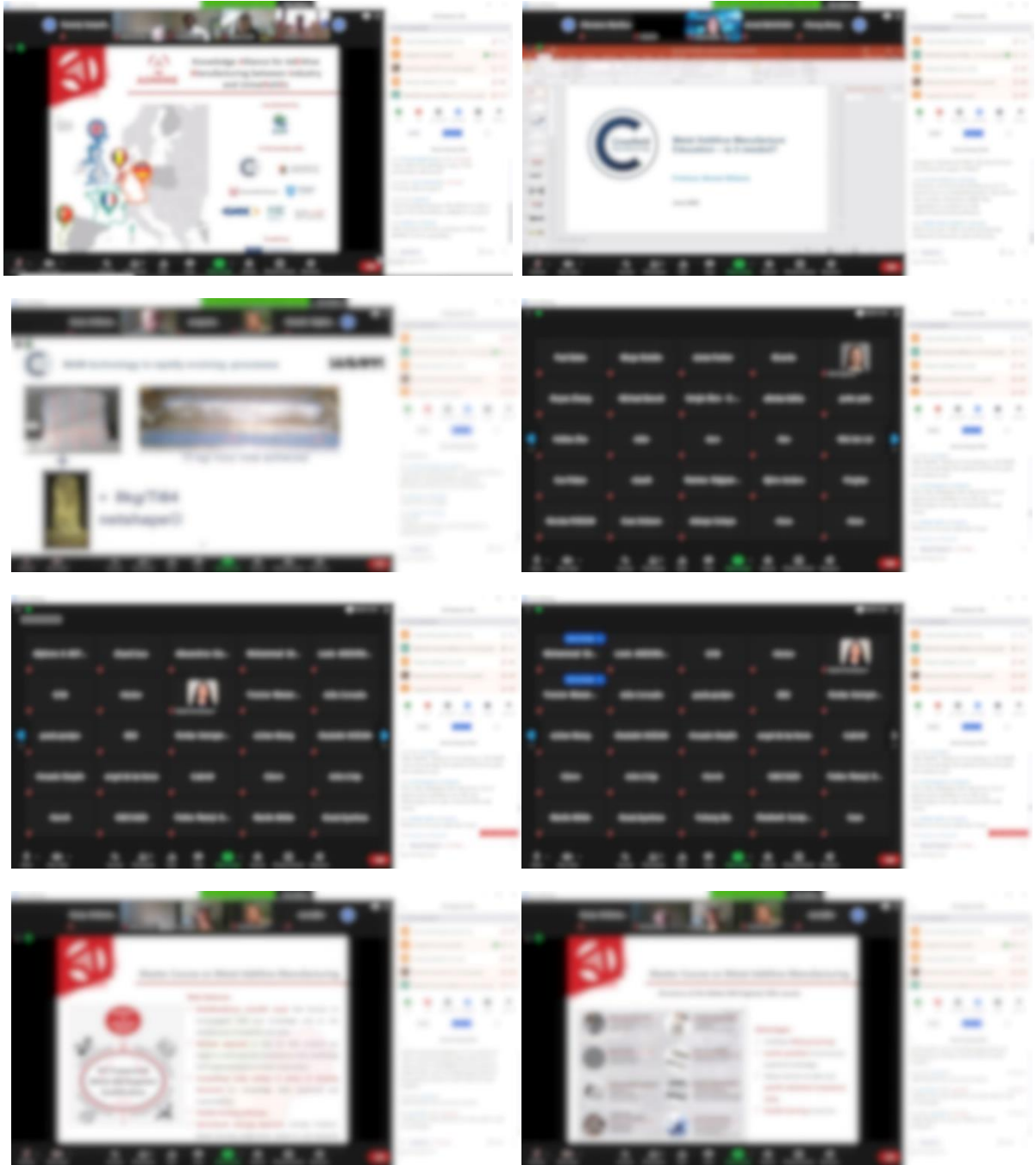
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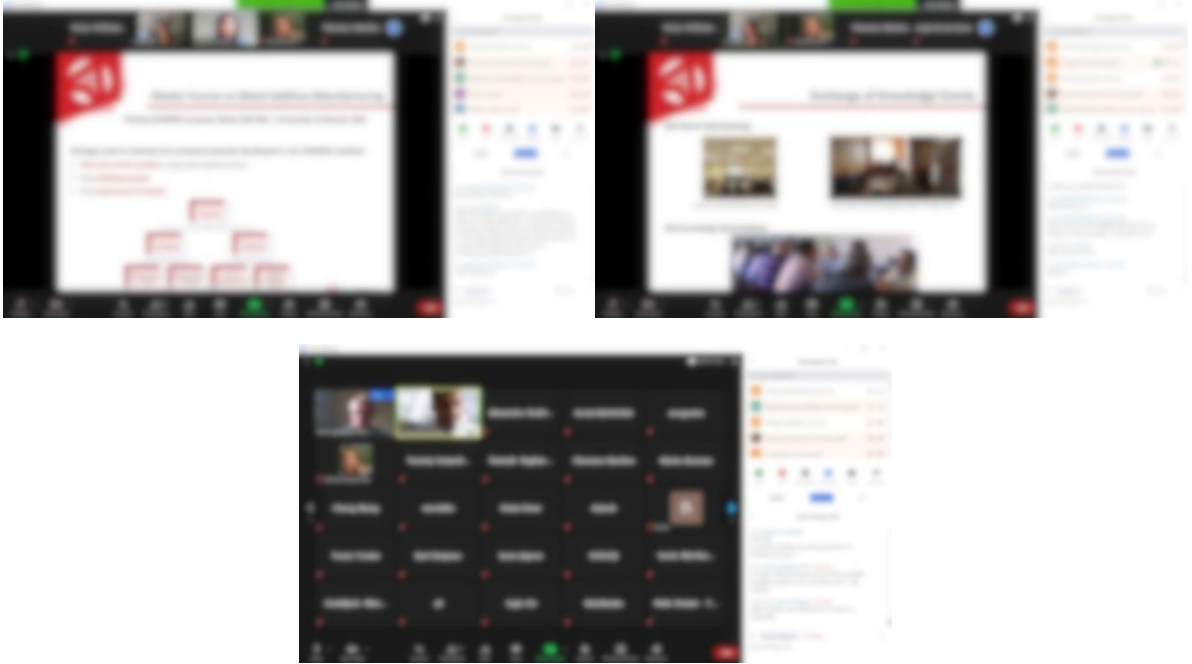
## APPENDIX I

### Screenshots from the ADMIRE AM Symposium



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## APPENDIX II

### Screenshots from the ADMIRE Final Conference



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