

Researcher Links Workshop 2017 Conference

## Evaluation of a rail-orientated researcher links workshop

Andrew Dawson, City of Sunderland College, UK

Laura Dacoreggio Volpato Braz, UFSC, Brazil

Birgit Blauensteiner, St. Poelten University of Applied Sciences, Austria

Cassiano Augusto Isler, UFSC, Brazil

Acires Dias, UFSC, Brazil

Yesid Asaff, UFSC, Brazil

Marin Marinov, NewRail, Newcastle University, UK

### Abstract

This paper presents the results from a rail-orientated researcher links workshop, which was organised in Joinville, Brazil. The aim of the workshop was to discuss congestion in Brazil. 34 participants from the UK and Brazil attended the workshop. Feedback forms have been distributed. The information collected has been analysed statistically. The results from the statistical analysis show very positive views upon the workshop.

**Keywords:** rail workshop, networking, talks, discussions, rail skills, innovation, collaboration, evaluation, statistical analysis

### 1. Introduction

Railways in Brazil comprise a market share of 24%, when road experiences a market share of over 60% (HEP, 2016). Railways in Brazil concentrate on the transport of bulk cargo in long distances, serving products such as iron ore, soybeans, corn, steel and other minerals. Passenger services by rail connecting large Brazilian cities are not popular. There are some metro systems in large Brazilian cities like Rio de Janeiro and Sao Paulo. The conventional railway network in Brazil, as it stands at the moment, does not provide connections between the Brazilian States. It mainly consists of single lines linking the mines with the closest ports for export of iron ore and other bulk products.

Road transport is dominant in Brazil, there is a lot of congestion in the country. The “congestion” problem observed on Brazilian highways, motorways, roads, in and around cities causes ever growing emissions due to massive fuel consumption of dominant road transport throughout the country. Road transport is responsible for 99% of all accidents associated with transport in Brazil. For 2016 this number was 96400 (6390 deaths) (ANTT, 2017). Hence Brazil experiences significant difficulties associated with seamless movement of people and freight, reliable service and sustainable infrastructure, comfort, safety and security while in transit and *en road*. This is where railways can help and introduce a real change to quality of life in Brazil.

Motivated by this situation a rail-orientated workshop has been organized to discuss strategies and possibilities for setting up more rail services.

### 2. Aims

The aim of this rail-orientated workshop was to build a solid UK-Brazil collaboration centred on research and innovation challenges associated with sustainable rail transport. The topic has direct relevance to safety, environment, health, business, social welfare and economic development in Brazil as it was

envisaged to identify ways that could tackle the “congestion” problem in the country. It was believed that a significant contribution to improving quality of life could be achieved by encouraging the removal of lorries and cars from the Brazilian highways and roads.

A reliable rail system helps tackle global challenges such as securing a service in extreme weather conditions, better urbanisation, seamless mobility, more access to businesses, food supply and sustainable use of energy, less accidents on the road, more security in our daily life. Hence this workshop aimed to bring together rail scholars and early career researchers from Brazil and the UK to discuss and raise awareness of how the railways can help meet the social and economic needs of the growing population of Brazil.

Another aim of the workshop was to intensify and support rail research areas relevant to the economic development and welfare of Brazil. Such areas included: Short Haul Rail Freight Operations, Urban Freight by Rail, Rail Passenger Services, HSR, Light Rail and Metro. Specifically we discussed the most recent developments from recently completed research projects and their potential for implementation in Brazil.

The workshop also aimed to secure capacity building of early career researchers specialising in rail or interested in starting a career in rail. We brought along the concept of “Rail Talent” and discussed the benefits that railways can potentially offer for personal and professional development. We expected a strong interest as railway is one of the fastest growing industries in the world at the moment, offering solid opportunities for innovation, constructive thinking, technological research and a rather steady career path.

To sustain the outcome from the workshop over time another aim of the workshop was for coordinators to discuss the opportunity for early career researchers to enroll in rail-orientated PhD/PostDoctoral programmes and also encourage all participants to apply for international research collaborative schemes. It was believed that this is how future rail research projects will materialise and contribute to a sustainable growth in both countries.

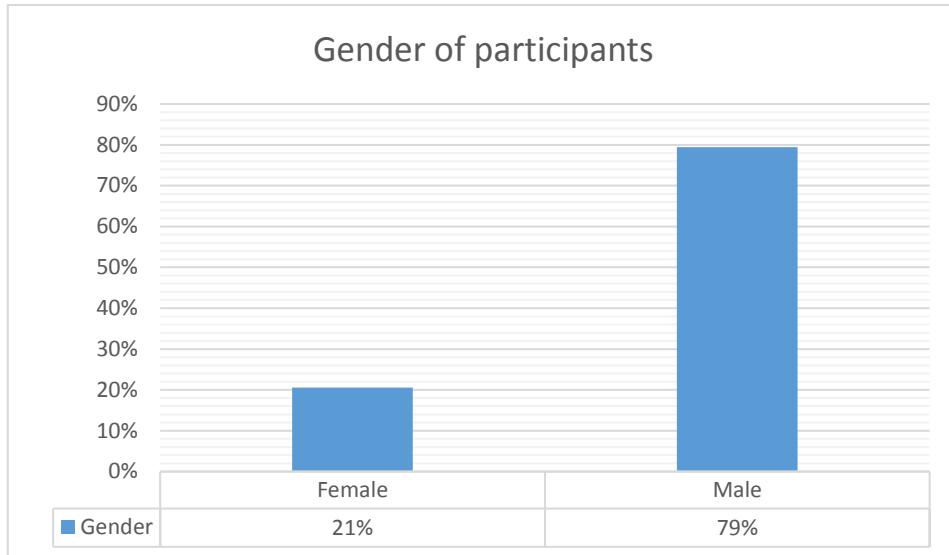
In the very core of the workshop we aimed to create and offer an environment which can stimulate collaborations with the railway industry in both countries to secure longer term links in rail between the UK and Brazil. Academia and industry have been invited to join forces, analyse and understand the longer term benefits from such a collaboration encouraging the development of joint rail research projects and intensive rail training programmes for knowledge exchange and capacity building.

Other events and initiatives offering similar discussions include Tunrail project funded by ATLANTIS, RailNewcastle Intensive programmes, talks and conferences, the UIC project on railway talents, the RailExchange project sponsored by Newton Fund and the NSAR training partnerships. These events and initiatives will not be discussed further in this paper, instead the interested reader is referred to: Marinov et al (2011a, b), Lautala et al (2011), Marinov M and Ricci S. (2012), Marinov (2013), Marinov M, Fraszczyk A. (2014), Fraszczyk A, Dungworth J, Marinov M. (2015a,b), Fraszczyk A, Drobisher D, Marinov M. (2016), NSAR (2016), Fraszczyk A, Amirault N, Marinov M. (2017).

### **3. Evaluations**

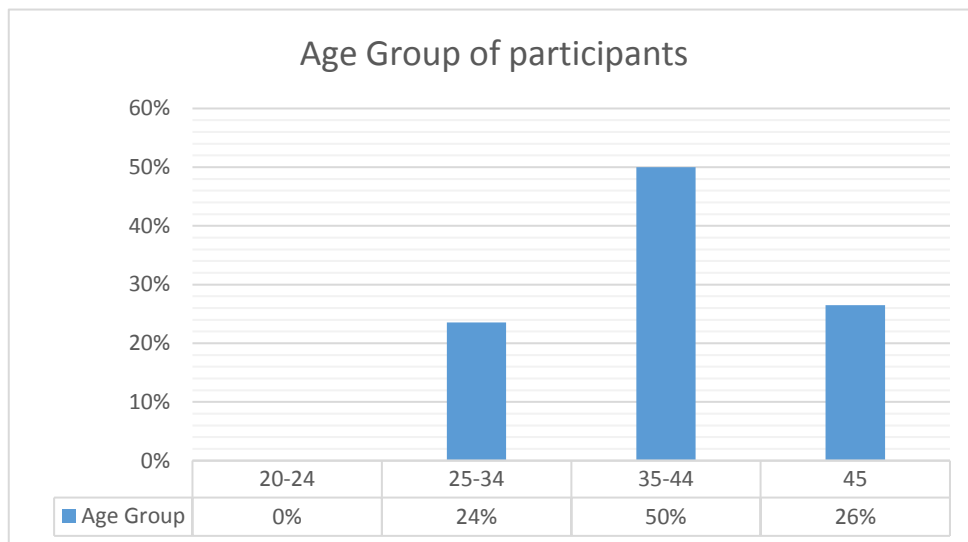
Participants were asked to fill in a feedback form regarding their views upon the workshop. This data was collected and statistically analysed. The feedback form was split into five sections; About You, Collaboration, Your Research, About the UK and This Workshop. Also along with the opportunity to put forward your own comments about the workshop. Some of the questions were answered on a 1-5 scale which the participant chose depending on the type of the question.

Section one focused on the participant and their field with a sample size of 34 participants. Question one asked participants their gender, results are shown in Figure 1. The majority of participants were male (79%) compared to female (21%).



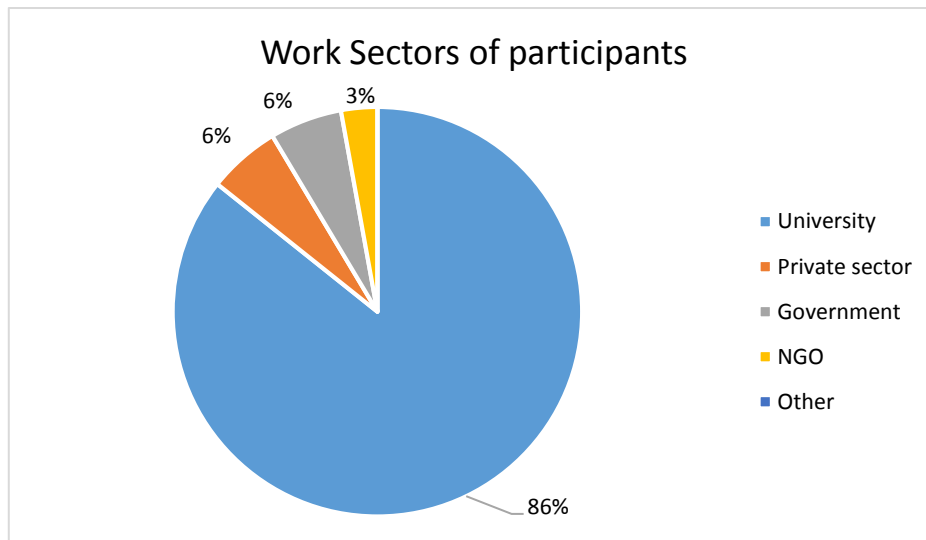
**Figure 1 - A bar chart to show the percentage of participants who are male or female.**

Question two asked participants to identify their age group, results are shown in figure 2. The age of the participants were varied with a mean of 38.6 years old. 24% were aged in the range of (25-34) years old, 50% in the range of (35-44) years old and 26% aged 45.



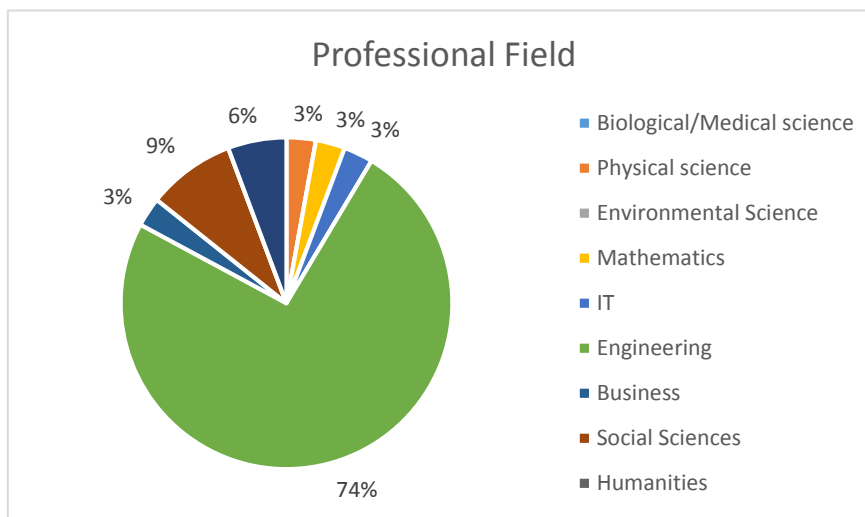
**Figure 2 - A bar chart to show the age groups of the participants.**

Question three regarded the work sector of the participants, results shown in figure 3. 86% of participants are in the university sector, 6% in the private sector, 6% in the government sector and 3% in the sector of NGOs.



**Figure 3 - A pie chart to show the work sectors of the participants.**

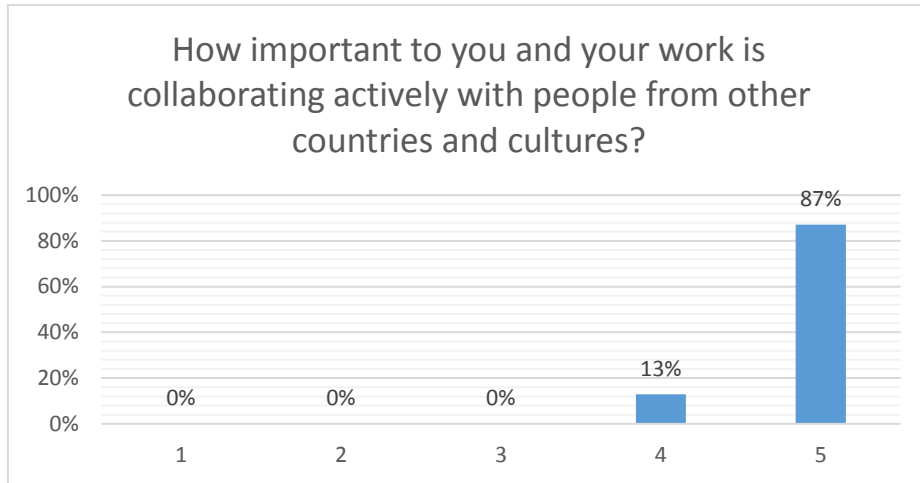
Participants were asked to identify their professional field, the results from question 4 are shown in figure 4. The results show 74% of participants are within the field of engineering followed by 9% in social sciences. 6% in other fields such as computer science and rail and 3% in each field of; Physical Sciences, Mathematics, IT and Business.



**Figure 4 - A pie chart showing the distribution of professional fields of the participants.**

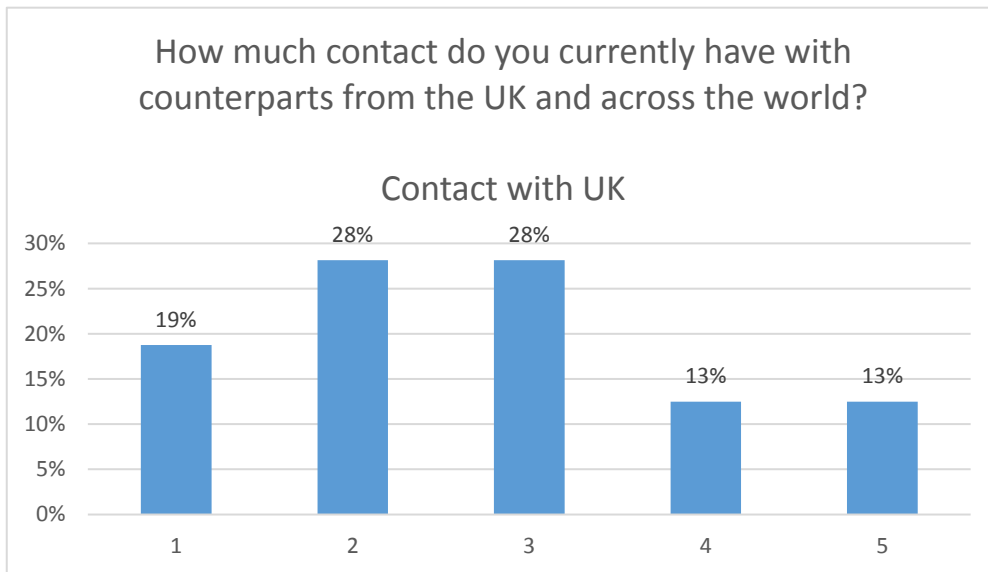
Section two regards the collaboration between countries and counterparts, the sample size for this section was 32. All the questions within section 2 asked participants to answer the questions on a scale of (1-5) depending on the nature of the question.

Firstly, the participants were first asked in question one to rate how important it is to collaborate actively with people from other countries and cultures. The results are shown in figure 5. 87% of participants believe it is 'very important' to collaborate with people from other countries and cultures. Along with 13% who believe it it 'important' to collaborate with people from other countries and cultures.



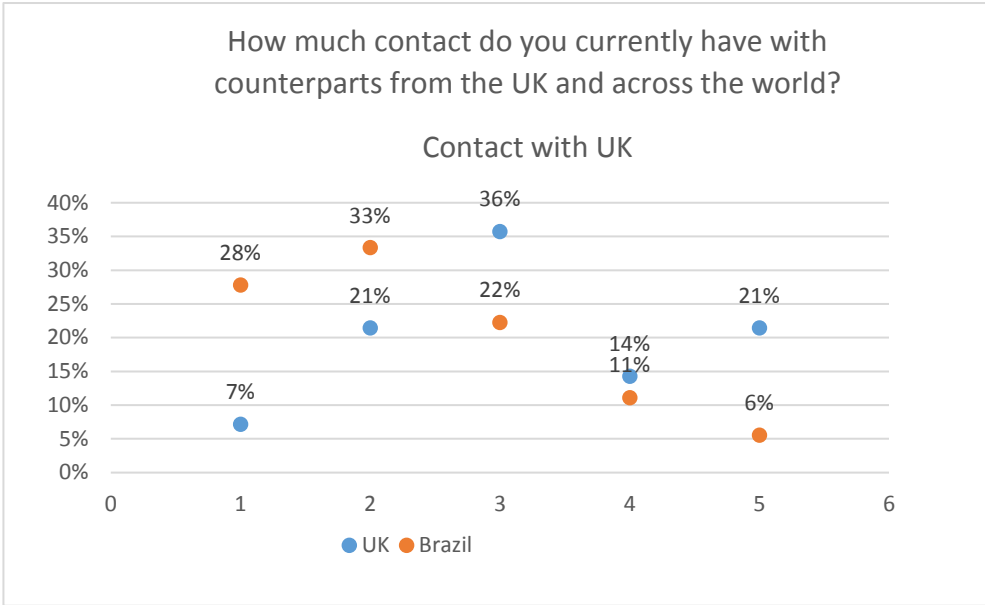
**Figure 5- A bar chart to show how confident participants felt about the collaboration between countries.**

In question two participants were asked how much contact do they currently have with counterparts from the UK. Results are shown in figure 6. 13% of participants have 'a lot of contact', 13% have 'contact', 28% of participants have 'some contact, 28% have 'not a lot' of contact and 19% have 'no contact'.



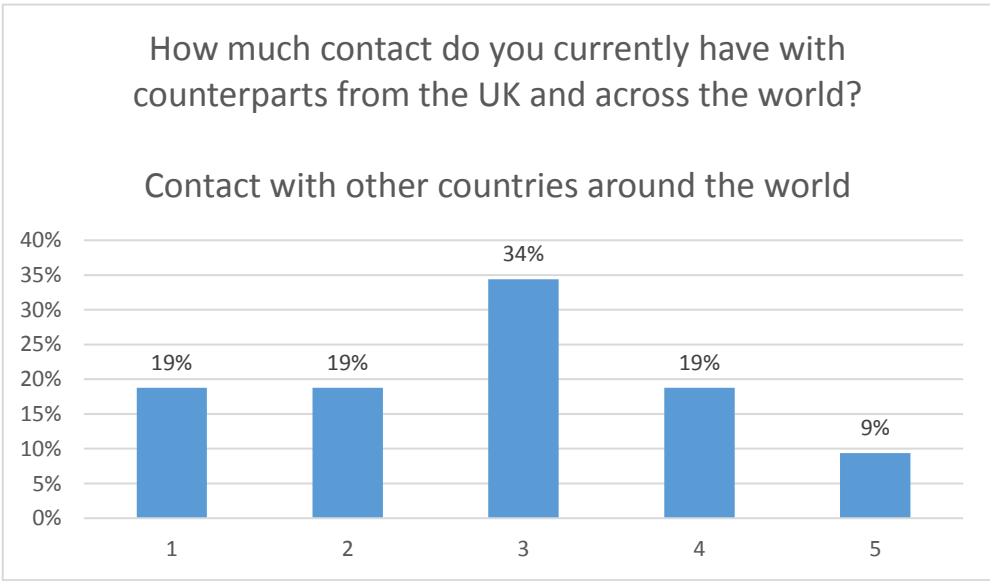
**Figure 6- A chart showing the percentage of participants who currently have counterparts within the UK.**

Figure 7 shows a scatter diagram where the results have been split into 2 groups, UK and Brazil participants. 28% of participants from Brazil have no contact with UK. 7% of participants from the UK don't have counterparts within their own country.



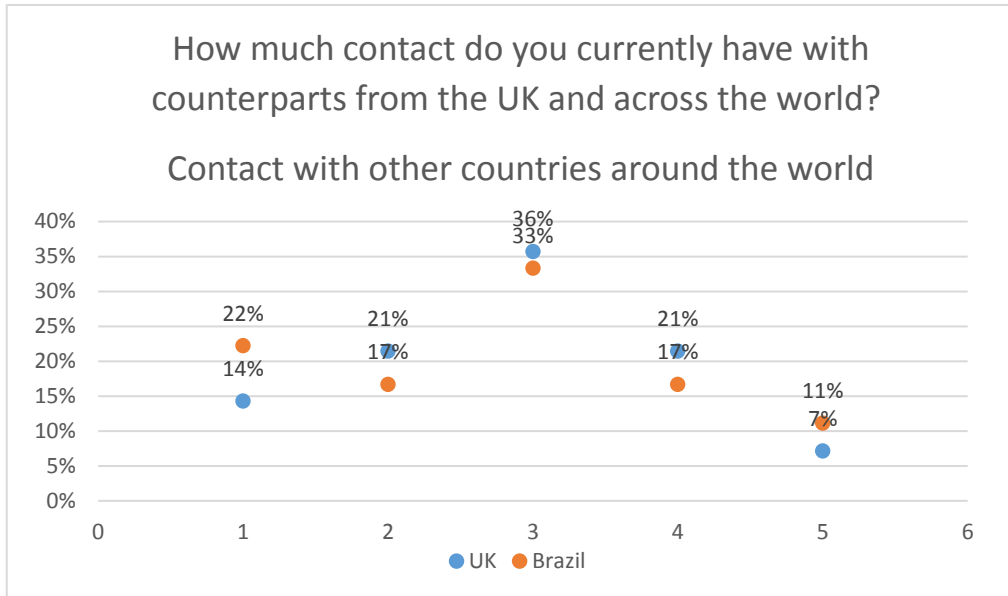
**Figure 7- A scatter graph to show both UK and Brazil participants' state regarding contact with the UK.**

However, not many of the participants currently have counterparts from the UK with the average score being 2.5 shown in figure 4. In addition to this, the same pattern emerges with the average score, for contacts from the other countries around the world, with a score of 3.



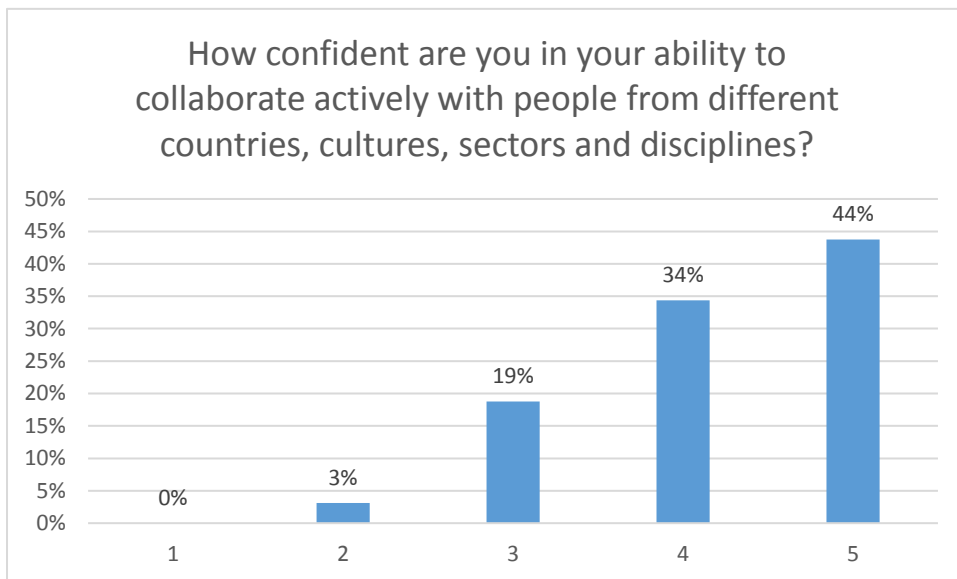
**Figure 8- A bar chart showing distribution of participants who have contact with other countries.**

Figure 8 shows both participants from the UK and Brazil have a similar opinion upon their current contacts with counterparts from around the world.



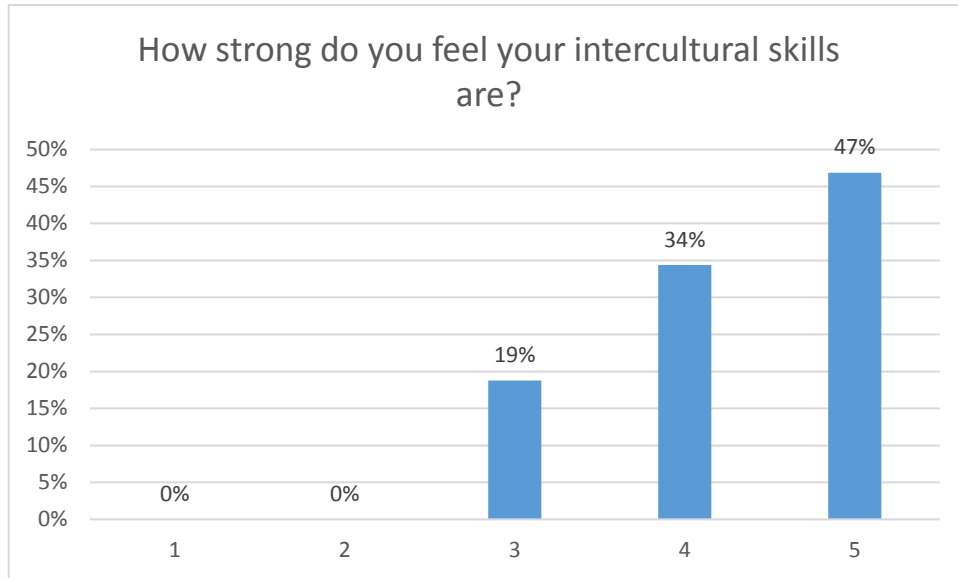
**Figure 9- The scatter graph shows the distribution of UK and Brazil participants who currently have contact with other countries.**

Participants were asked if they are confident in their ability to collaborate with people from different cultures, sectors and disciplines from question three. The results are shown in figure 10. Participants believed they were 'confident' in their ability to collaborate actively with people from different countries, cultures, sectors and disciplines with an average score of 4.2 and 44% believe they are 'very confident' with a score of 5 and 3% believe they 'not very confident'.



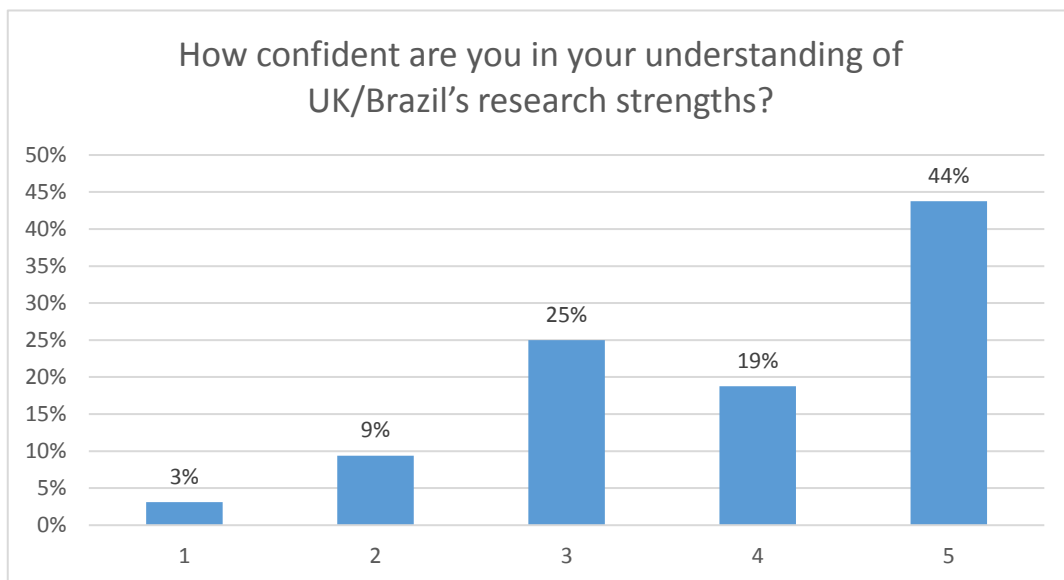
**Figure 10 - A bar chart to show the response from participants about their confidence to collaborate with other people from different countries, cultures, sectors and disciplines.**

Within question 4, participants were asked to rate their intercultural skills, figure 11 shows the results. 47% of participants believe their intercultural skills are 'very good' and 34% believed their skills were good. 19% believe their intercultural skills are 'standard'.



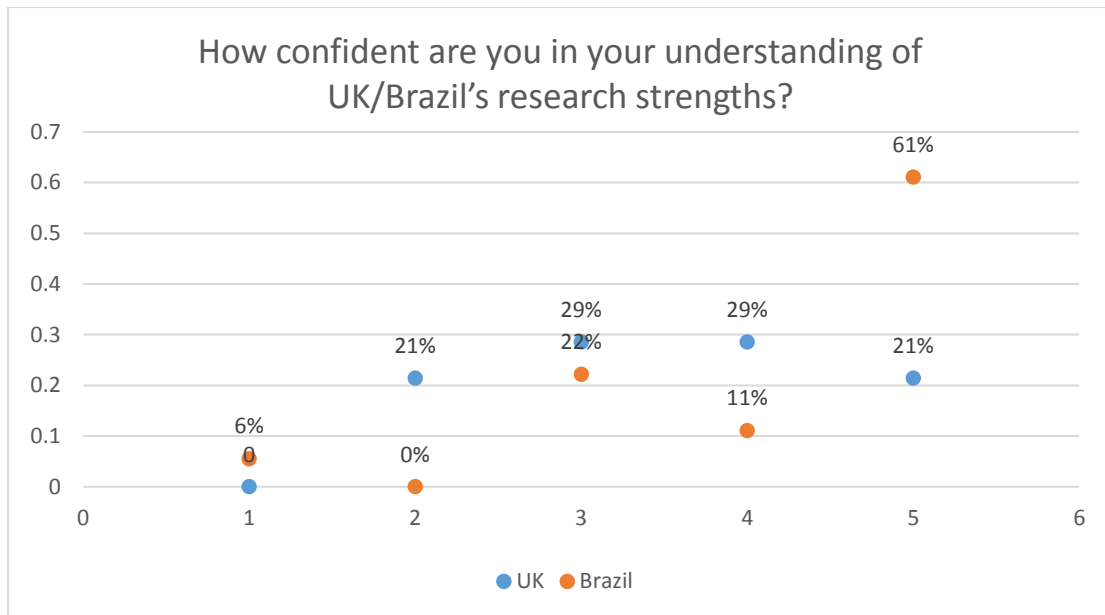
**Figure 11 - A bar chart showing the results of how confident participants are in their intercultural skills.**

Participants were then further asked in question five to rate their confidence in their own understanding of UK/Brazil’s research strengths. Figure 12 and figure 13 show the results. 44% of participants are ‘very confident’ with their understanding of UK/Brazil’s research strengths. 19% said they were ‘confident’, 25% believe they are ‘below averagely’ confident. Unfortunately, 9% of participants believe they are ‘not very confident’ and 3% of participants are ‘not confident’. The average score for this question was 3.9.



**Figure 12- A bar chart showing percentage of participants who are confident in understanding UK/Brazil research strengths.**



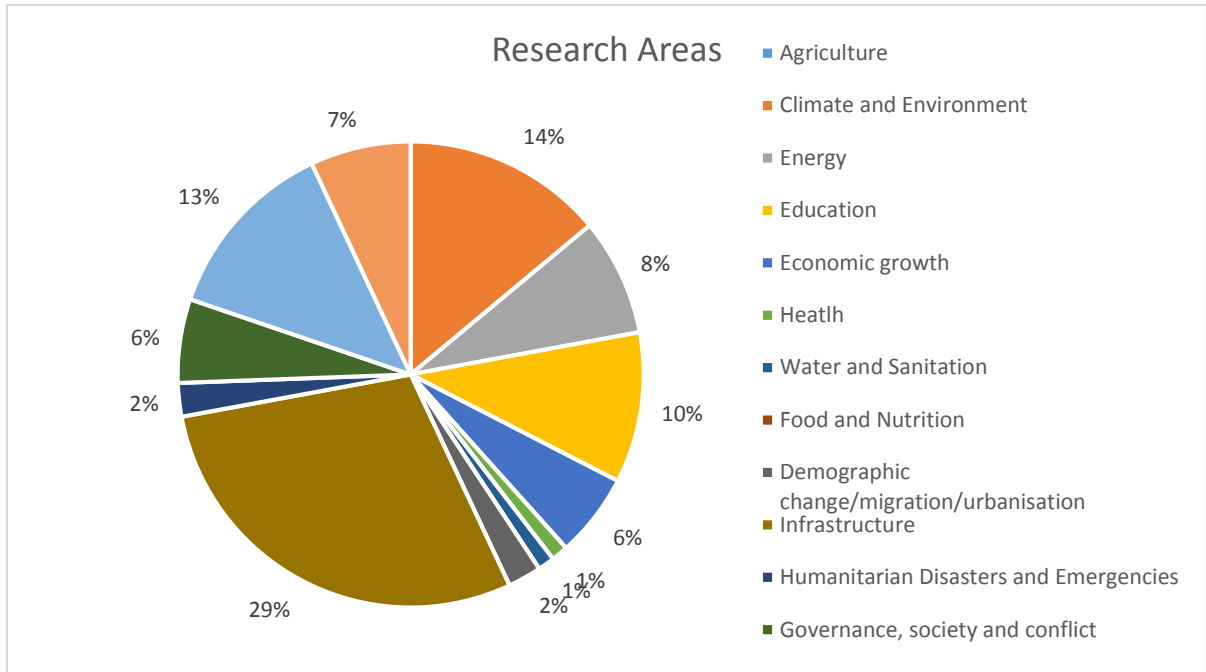


**Figure 13- A bar chart showing percentage of participants who are confident in understanding UK/Brazil research strengths.**

Next, participants were asked to list the three main research strengths of UK/Brazil. The most common research strengths chosen were; city logistics, freight transport and rail engineering.

In section three, participants were asked about their current state of research, the total sample size for this section was 27 participants. Participants were asked if their research deals with development issues in question one. This question gained a very positive result with 100% of participants' research dealing with development issues.

To gain more insight into participant's research, within question two participants were asked to choose an area within which their research falls, figure 14 shows the results. The results found are as follows; 29% of the participant's research area is in infrastructure; 14% in climate and environment; 13% in agriculture; 10% in education; 8% in energy; 7% in other research areas; 6% in governance, society and conflict; 6% in economic growth; 2% Humanitarian disasters and emergencies; 2% in demographic change/migration/urbanisation; 1% in health and 1% in water and sanitation.



**Figure 14** The pie chart shows the research areas of the participants.

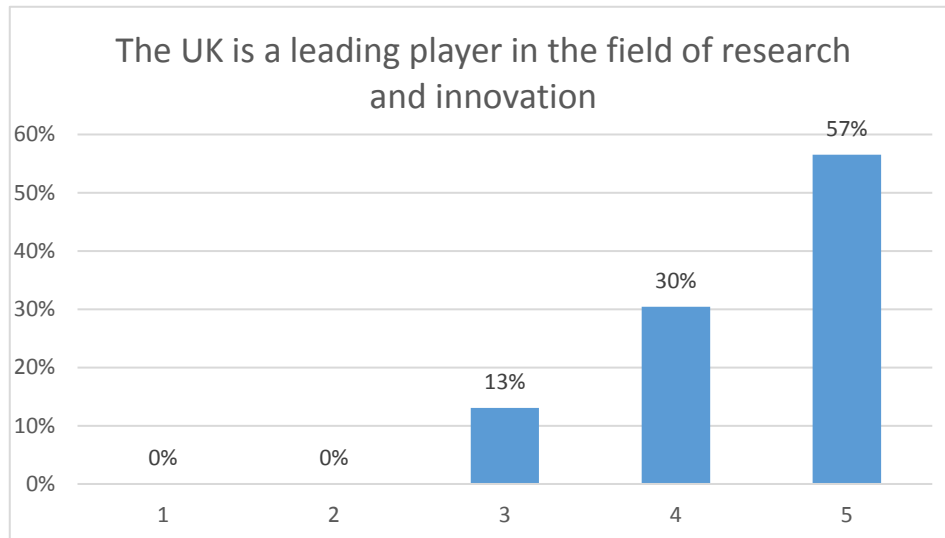
Question three asked participants how confident they were that their skills in the research area chosen in the previous question were representative of current international best practice, results are shown in figure 15. The results are mostly positive with 28% of the participants being 'very confident' in their skills, 44% 'confident'; 25% 'averagely confident and 3% 'not confident'. The average score was estimated to be 3.9.



**Figure 15-A** bar chart to show how confident participants were with their research skills in current international practice.

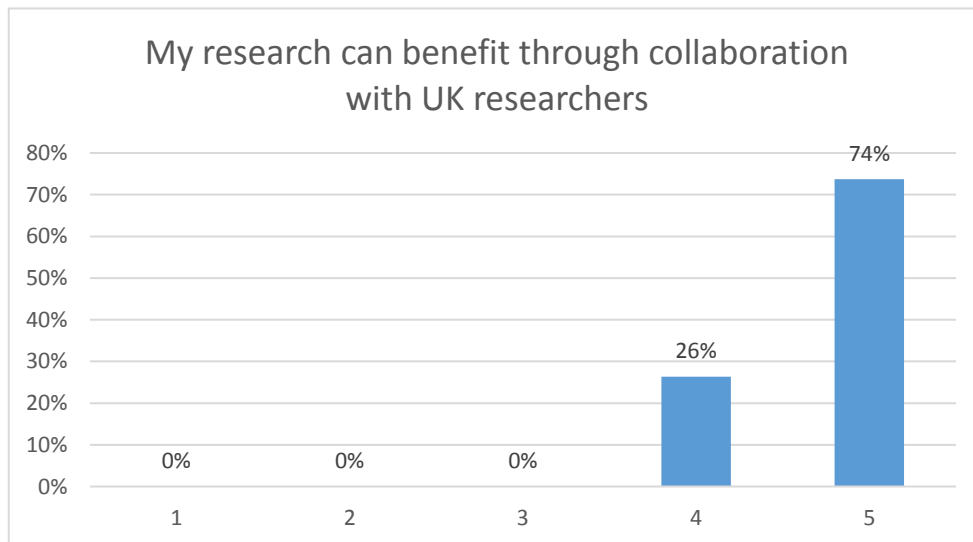
Section four consisted of only two question which were only to be answered by UK participants. This section focused on the research strengths of the UK. This section has a total sample size of 19 participants.

Question one asked participants if the UK is a leading player in the field of research and innovation, the results are shown in figure 16. 57% of participants 'strongly agree' the UK is a leading player in the field of research and innovation. 30% 'agreed' and the remaining 13% 'weren't sure'.



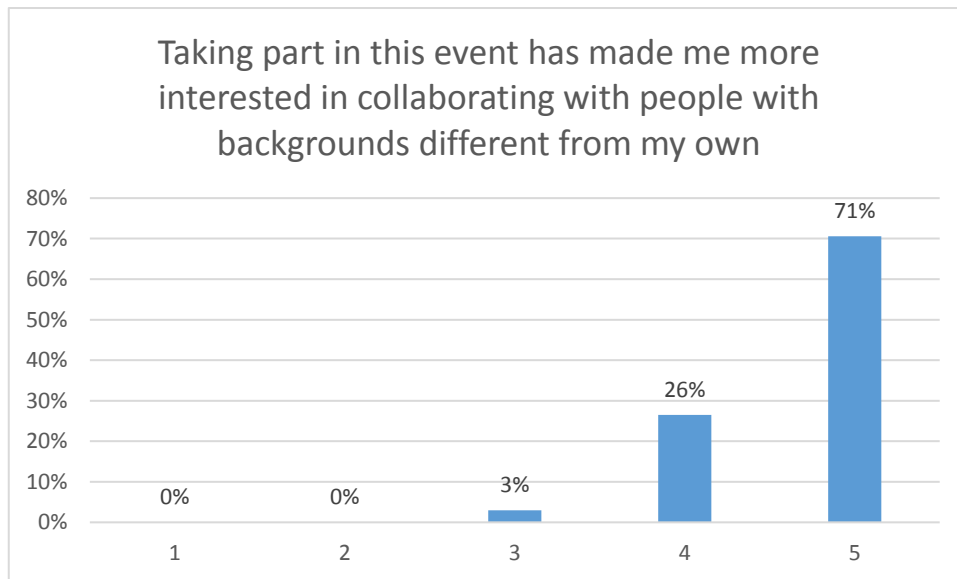
**Figure 16- A bar chart to show the response from participants who answered the question; Is the UK a leading player in the field of research and innovation?**

The second question, in section four, asked participants if their research could benefit them through collaboration with other UK researches, results are shown in figure 17. A positive 74% 'strongly agreed' that collaboration with UK researches will indeed benefit them and the remaining 26% 'agreed' it will also.



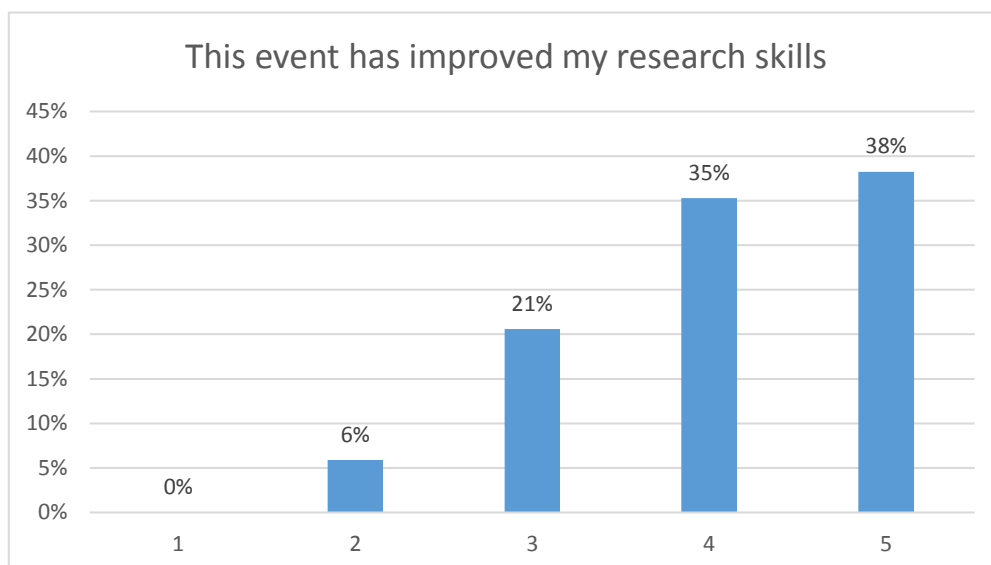
**Figure 17- The graph shows the response from participants about if their research can be benefited through collaboration with UK researchers.**

Section five asked all participants upon different aspects of the workshop, the sample size for this section was 34 participants. Question one asked participants if the workshop had made them more interested in collaborating with people who have different backgrounds from their own, figure 18 shows the results. 71% of participants 'strongly agree' the workshop has made them more interested in collaborating with people who have different backgrounds to their own; 26% are 'agree' and 3% are 'averagely agree'. However the average score from this question was 4.6



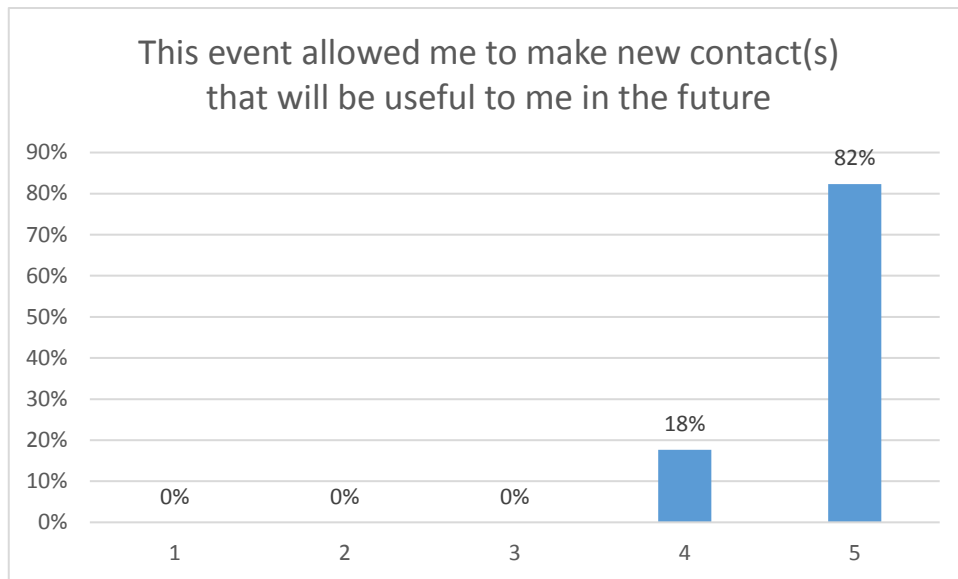
**Figure 18 - A bar chart showing the response from participants if the workshop had made them more interested in collaborating with people who may have different backgrounds from their own.**

Question two asked the participants if the workshop has improved their research skills, figure 19 shows the results. 38% 'strongly agreed' with the statement and 35% 'agreed'. Overall, most of participants had improved their skills with only 6% who 'disagreed'.



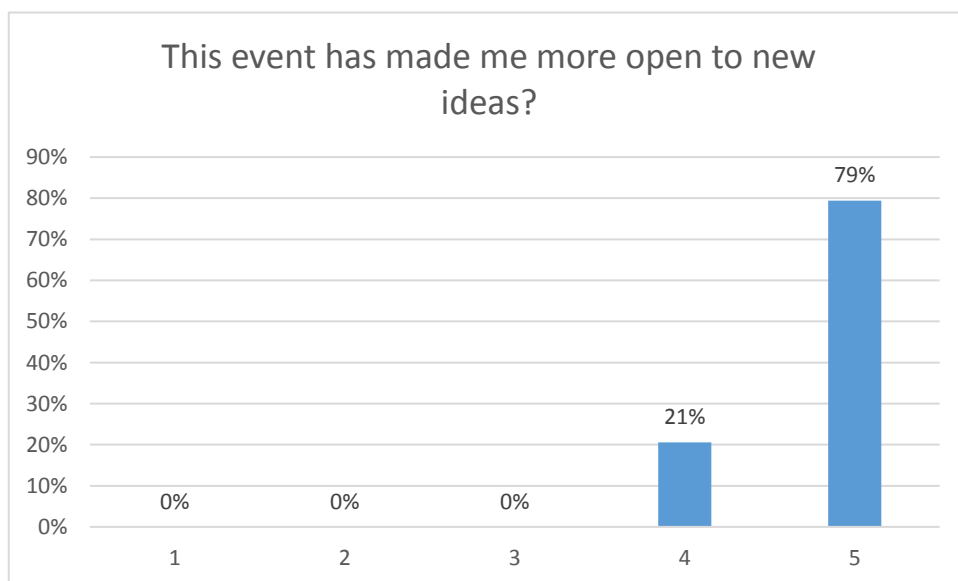
**Figure 19- A bar chart to show the response from participants who answered the question; Has this event improved your research skills?**

Participants were further asked in question three if the event has allowed them to make new contacts that will be useful to them in the future, figure 20 demonstrate the results. 82% of participants 'strongly agreed' that the event allowed them to make new contact(s) that will be useful to them in the future. The remaining 18% 'agreed'.



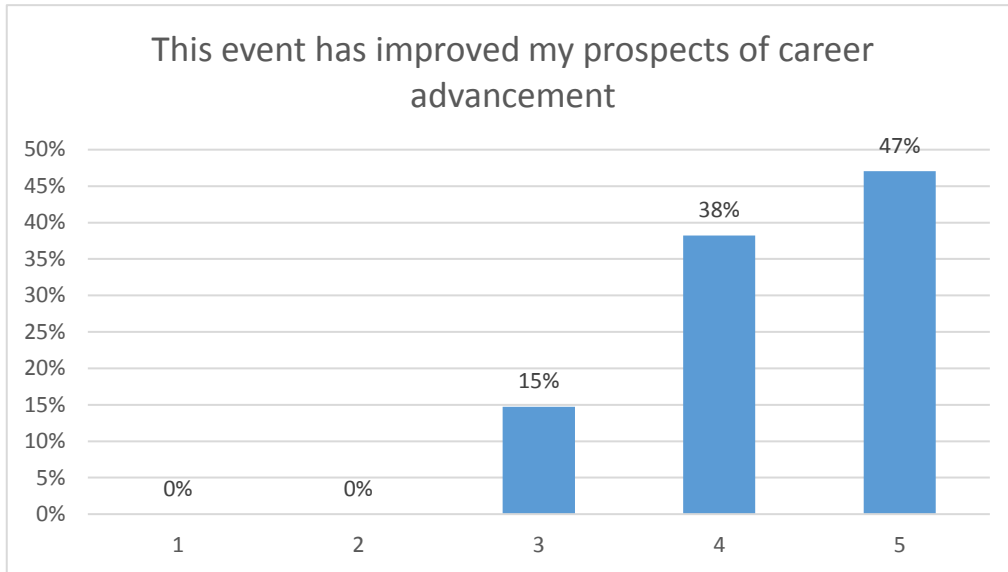
**Figure 20 - A bar chart representing the percentage of participants who have made new contacts.**

Question four gained a very positive result which participants answered the following question. Has the event had made them more open to ideas? Results are shown in figure 21. 79% of participants 'strongly agreed' that the workshop made them open to new ideas along with the remaining 21% who 'agreed'.



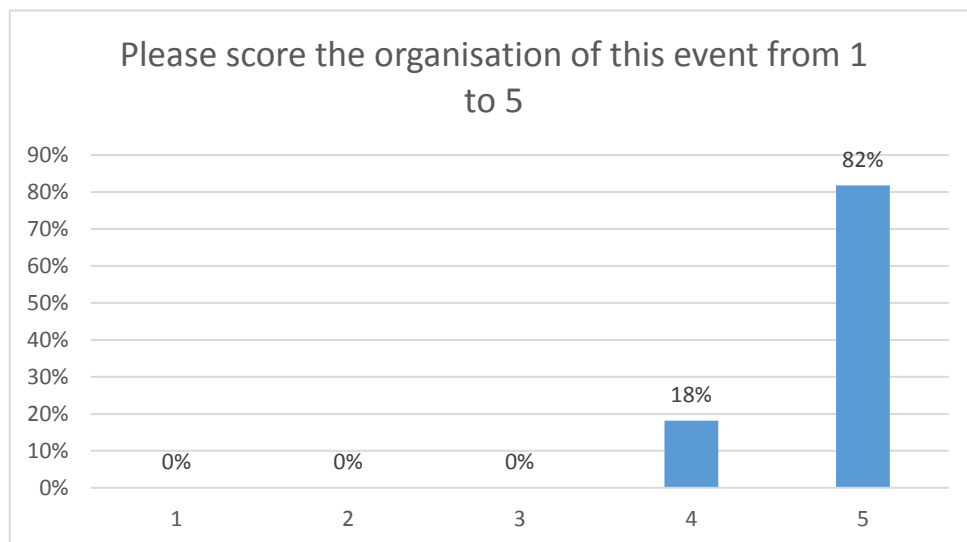
**Figure 21- A bar chart showing the results from the question asked; has the event made participants more open to new ideas.**

Question five asked participants if the event had improved their prospects of career advancement, figure 22 shows the results. The average score was 4.3 with 47% of participants 'strongly agreeing'; 38% who just 'agreed' and 15% who 'moderately agree'.



**Figure 22** A bar chart to show the percentage of participants in response to the question; Has the event improved your prospects of career advancements?

Finally, question six asked participants to score the organisation of the workshop as a whole, figure 23 show the results. The results was very positive with 82% of participants who believed the organisation was 'very good' with the remaining participants (18%) thought the organisation was 'good'.



**Figure 23-** A bar chart showing the percentage of participants who scored the organisation of the workshop on a scale 1-5.

At the end of the feedback form there were two questions only to be answered from the workshop co-ordinators. The total sample size for these questions were 3 participants. Question one asked the co-ordinators if the workshop has be useful in advancing the quality of their research in their field of study, figure 24 shows the results. 80% 'strongly agreed' that their research has advanced in quality because of the workshop. The remaining 20% 'agreed' that their research has been advanced in quality.

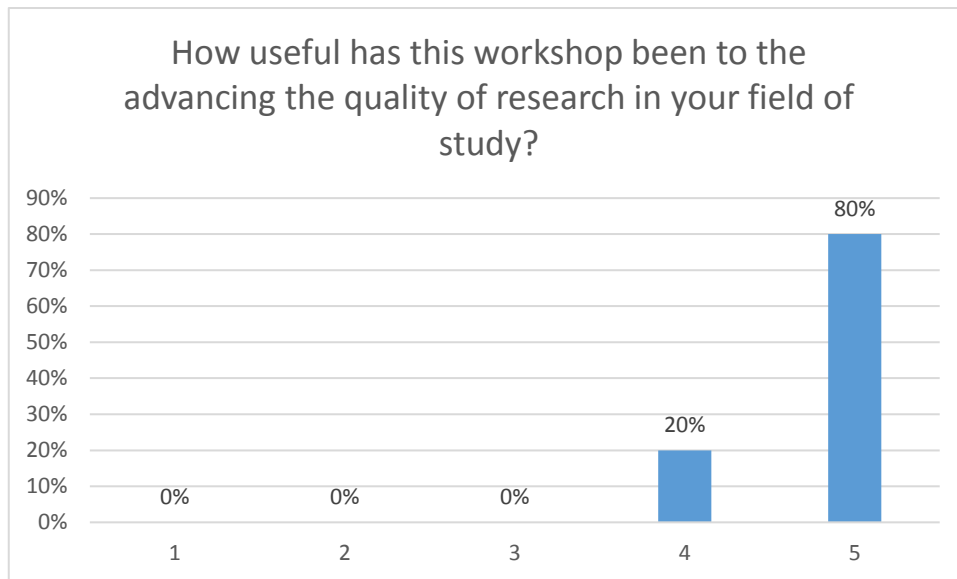


Figure 24 - A bar chart representing the results from the question; Has the workshop advanced the quality of your research in your field of study.

The second question asked the co-ordinators if they have made any new links with counterparts from the UK or Brazil. 100% of co-ordinators said they have made new counterparts.

The final question asked all participants to leave any other comments about the workshop such as improvements. Some of the participants responses were that they would like more time for networking; if a list of participants with their names, organisations and emails could be shared so further discussion and collaboration could continue. Furthermore, for the technical solutions within the workshop to be explained in more detail and to have seen more specific/technical discussions in terms of research.

#### 4. Lessons Learnt

The lessons learnt from the viewpoint of organization and accomplishment of the workshop can be assessed from the academic, technological and professional perspectives.

Academically, it must be highlighted the importance of participants sharing their experience and knowledge about a wide variety of existing track and rolling stock-based technologies, geometric design concepts, construction procedures and business plans for the consolidation and expansion of rail transport systems, especially when transferring expertise from the British environment to the Brazilian needs.

In addition, the presentation of different railway-orientated solutions at the workshop for both freight and passenger intercity and urban transport expanded the horizon of participants regarding logistics and mobility issues in the context of Brazil.

Finally, from the viewpoint of professional interaction, the workshop made it possible for professionals of different backgrounds who work directly with rail projects, business plans and research to interact and juggle ideas. This scenario has led to proposal for potential new scientific and technological projects for revitalizing the Brazilian railway transportation system to be developed in medium and long horizon.

In this way, it is believed that the workshop was a great opportunity for absorbing the experience of highly skilled professionals representing the railway sector in the UK and Brazil. As a result it has now paved the way to plenty of other joint ventures and collaborative projects in rail involving partner institutions from the UK and Brazil.

## Acknowledgement

The authors would like to thank Newton Fund for sponsoring the workshop.

## References

ANTT (2017) Anuário Estatístico de Transportes 2010 -2016 Brasília – 2017

Fraszczyk A, Dungworth J, Marinov M. (2015 a) Analysis of Benefits to Young Rail Enthusiasts of Participating in Extracurricular Academic Activities. *Social Sciences* 2015, **4**(4), 967–986.

Fraszczyk A, Dungworth J, Marinov M. (2015 b) An evaluation of a successful structure and organisation of an intensive programme in rail and logistics. *In: The 3rd UIC World Congress on Rail Training*. 2015, Lisbon, Portugal.

Fraszczyk A, Drobisher D, Marinov M. (2016) Statistical analyses of motivations to participate in a rail focused extra-curricular activity and its short terms personal impacts. *In: 7th International Conference on Operations and Supply Chain Management, Phuket, 2016*. 2016, Phuket, Thailand: The Laboratory of Logistics and Supply Chain Management.

Fraszczyk A, Amirault N, Marinov M. (2017) Rail Marketing, Jobs and Public Engagement. *In: Sustainable Rail Transport*. Springer, 2017.

HEP Transportation Consulting (2016) Brazil's Priority Transportation Projects, A resource guide for U.S. industry , the U.S. Trade and Development Agency

Lautala P, Edwards R, Rosario M, Pachi J, Marinov M. (2011) Universities in Europe and the United States Collaborate to Develop Future Railway Engineers. *In: WCRR - the 9th World Congress on Railway Research*. 2011, Lille, France.

Marinov M, Lautala P, Pachi J, Edwards R, Reis V, Macario M, Sproule W, Barkan C. (2011) *Transatlantic Cooperation in Railway Higher Education (TUNRAIL): Handbook for Railway Higher Education*. EU/US: The TunRail Project, 2011.

Marinov M, Pachi J, Lautala P, Macario R, Reis V, Edwards R. (2011) Policy-Oriented Measures for Tuning and Intensifying Rail Higher Education on both Sides of the Atlantic. *In: 4th International Seminar on Railway Operations Modelling and Analysis (IAROR)*. 2011, Rome, Italy: International Association of Railway Operations Research.

Marinov M and Ricci S. (2012) Organization and Management of an Innovative Intensive Programme in Rail Logistics. *Procedia-Social and Behavioral Journal* 2012, **46**, 4813-4816.

Marinov M. (2013) Introduction: Handbook: An intensive Programme in Railway and Logistics. *Research in Transportation Economics* 2013, **41**(1), 1-2.

Marinov M, Fraszczyk A. (2014) Curriculum development and design for university programmes in rail freight and logistics. *Procedia - Social and Behavioral Sciences* 2014, **141**, 1166–1170.

NSAR (2016) Resourcing Rail Book: Rail Sector Skills Delivery Plan