Co-funded by the
Erasmus+ Programme
of the European Union

DeCAIR

Developing Curricula for Artificial Intelligence and Robotics

DeCAIR Stakeholders Survey

Results and Analysis

March 15th, 2021

1. Survey Description

This survey was conducted within the framework of the Erasmus+ project "DeCAIR: Developing Curricula for Artificial Intelligence and Robotics" to collect feedback and input on the DeCAIR project activities and objectives from different stakeholders, specifically; professionals from the private and public sectors, instructors and students. It was distributed during the DeCAIR Stakeholders Workshop that was held virtually over Zoom on March 4th, 2021.

Generally, the survey is designed to evaluate the following aspects:

- The need, importance and impact of artificial intelligence and robotics (AIR)
- The status of AIR adoption in Jordanian and Lebanese markets and the need for AIR graduates
- The adequacy of existing academic programs in Jordan and Lebanon to prepare graduates with experience in AIR
- The need to establish specialized AIR academic programs and/or updating existing programs in Jordan and Lebanon

The survey was prepared electronically using Google Forms and is available in Appendix A. The survey contains 60 questions that are divided into three sections, one section for each category of the participants, such that:

- *Questions 2 through 24* are for the Enterprise/Governmental Agency/Professional Organizations Survey
- *Questions 25 through 38* are for the Student Survey
- *Questions 39 through 60* are for the Instructor Survey

We present an executive summary of the survey results in Section 2. In sections 3 through 5, we discuss the results for each category. The detailed results are available in Appendix B.

2. Executive Summary

Sixty-five participants from different categories and countries participated in the survey with the distribution given in Figure 2.1.

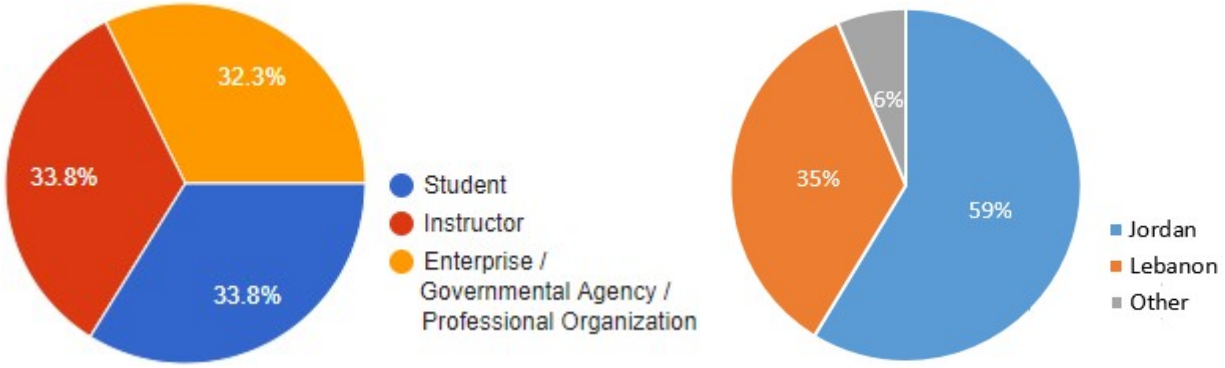


Figure 2.1. Distribution of participants by category and country

In general, the analysis of the collected responses reveals that there is a tangible level of recognition among the participants in different categories regarding the need, importance and impact of AIR. In the enterprise and government category, responses indicated that around 82% of these organizations have already adopted AIR, mostly to improve the quality of their products and to drive the innovation of new ones. This recognition of the importance of AIR has stimulated 70% of these organizations to define and execute training plans in AIR for their employees. Moreover, more than 90% of the participants agree that there will be an increasing demand on graduates skilled in AIR in the near future.

In the student category, the recognition of the impact and importance of AIR is reflected by the fact that 92% of the students have acquired some AIR knowledge through courses in curricula or online training. Also, more than half of the student participants believe that there is a medium to high demand in the market on graduates with AIR background.

As for the instructor category, the responses show that around 90% of the instructors have general knowledge in AIR or have practiced teaching and/or doing research in AIR. Also, around 90% of the instructors agree that the presence of AIR programs that advance and polish their skills and knowledge have direct impact on advancing their research and strengthening the collaboration with the industry to solve real life problems. Moreover, 84% of the instructors agree with the fact that improving the AIR skills in graduate would increase their employability. Due to this recognition, 65% of the instructors reported that their curricula is undergoing minor or major update to improve the quality of the graduates in the AIR domain.

Nonetheless, there was a general direct and indirect agreement among participants from different categories regarding the insufficiency and inadequacy of existing programs in Jordan and Lebanon to qualify graduates of existing programs to engage in jobs related to AIR, and to satisfy the demand of the job market for qualified employees and skillful researchers who can help in solving problems and improving the products. The lack of funding and expertise were reported as the main impediments to update existing programs, train instructors and establish/upgrade necessary labs and infrastructure.

Accordingly, 95% of the participants from all categories were in favor of establishing specialized AIR academic programs and/or updating existing ones in Jordan and Lebanon.

3. Enterprise/Governmental Agency/Professional Organization Survey Results

A total of 22 participants from this category filled the survey; 67% from Jordan, 24% from Lebanon and the rest are from Germany. The participants work in different enterprise domains such business analytics, control systems, image analysis, instrumentation and automation. As shown in Figure 3.1, 62% of the participants have more than three years of experience in AIR in the research and development domains.

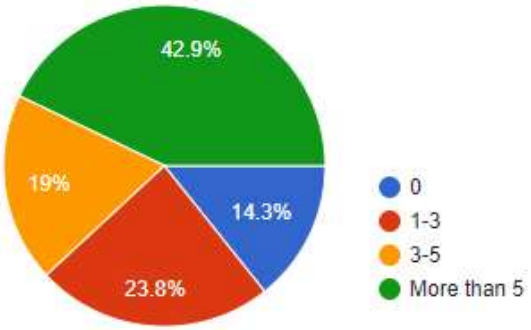


Figure 3.1. Participants AIR experience in years

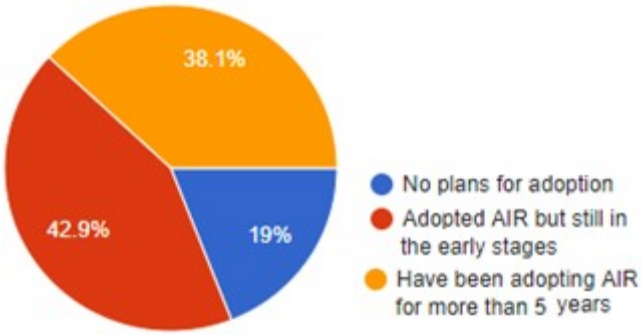


Figure 3.2. Distribution of AIR adoption in participants' organizations

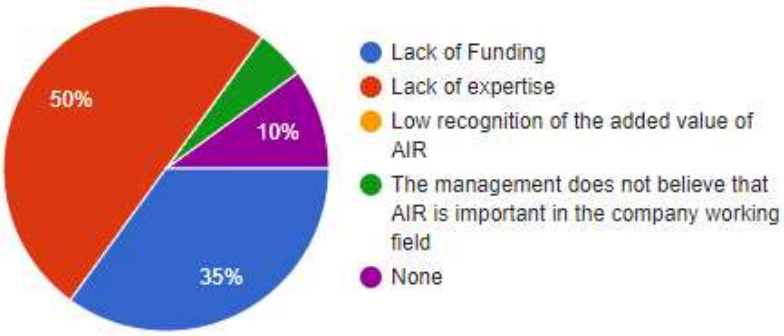


Figure 3.3. Challenges of AIR adoption

Figure 3.2 shows the level of involvement and adoption of participants' organizations in AIR. Around 43% of the organizations are in the early stages in the adoption of AIR while 39% have been adopting AIR for more than 5 years. Most of the participants (85%) believe that AIR will have direct impact on improving the quality of the products in their organizations, while 57% of them indicated that the adoption of AIR will motivate the creation of new products. However, most participants believe that there exist challenges and impediments to adopting AIR in their organizations as shown in Figure 3.3. In general, the lack of funding and expertise are reported as the main challenges in adopting AIR.

In terms of the capabilities of the workforce in the respondents' organizations, Figure 3.4 shows the distribution of the number of employees with AIR expertise in the participants' organizations with majority of organizations (57%) having between 1 to 5 employees with such experience. Also, and due to their recognition of the importance and impact of AIR, 70% of the organizations indicated that they have taken steps in the last five years to develop the AIR skills of their existing employees and 71% have established a training strategy for their employees in AIR as shown in Figure 3.5.

In order to expand their AIR workforce, Figure 3.6 shows that the frequent practice for of the organizations is to train their current employees (57%), perhaps to cut the cost and speedup the learning curve due to the lack of AIR experience for graduates. Nonetheless, the organizations may resort to hire and invest in fresh graduates to fill their needs (29%).

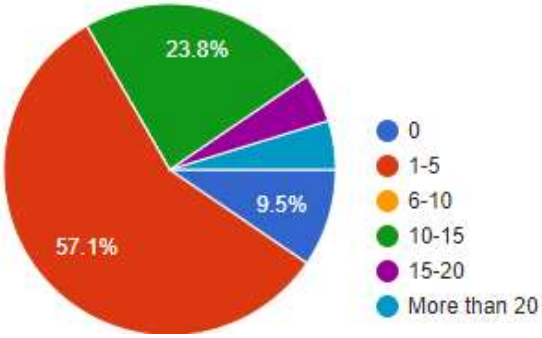
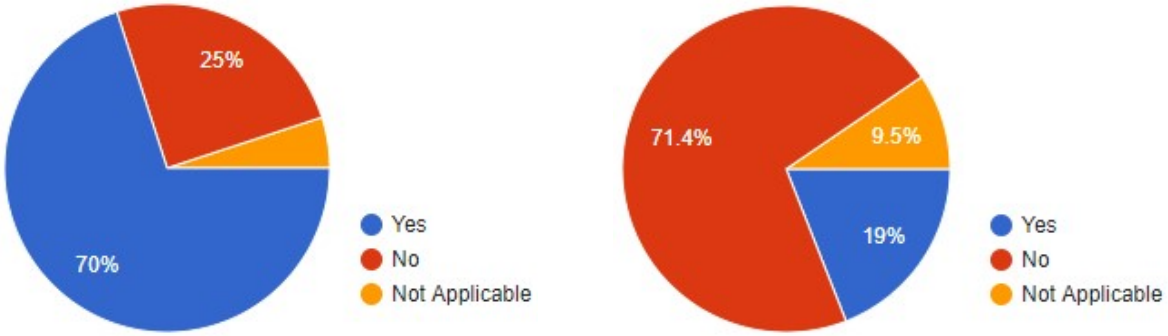


Figure 3.4. Number of employees with AIR experience in participants' organizations



AIR training started Existence of AIR training strategy

Figure 3.5. Status of AIR training in participants' organizations

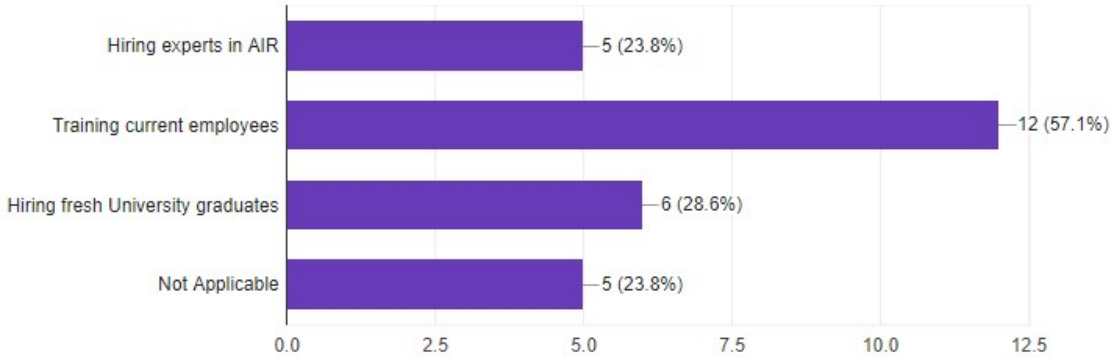


Figure 3.6. Approaches for increasing AIR workforce in participants' organizations

As for the role of universities in Jordan and Lebanon in adopting and supporting AIR, Figure 3.7 shows that half of the respondents see that there is low adoption of AIR in the academia while the rest think that the adoption is at medium level. However, and as shown in Figure 3.8, 90% of the respondents agree that the demand of for skillful graduates who are specialized in AIR will increase in the coming years and about 90% agree that the availability of AIR-skilled graduated may attract international companies to open offices in Jordan and Lebanon. Also, Figure 3.9 shows that about 95% agree that the availability of AIR undergraduate and graduate academic programs

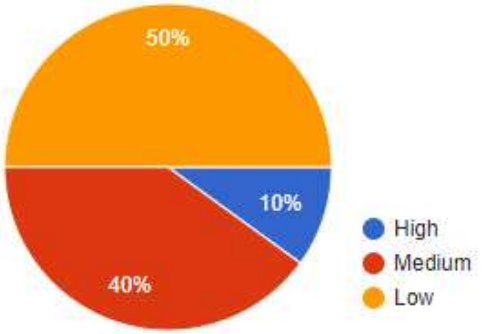


Figure 3.7. AIR adoption in Jordan and Lebanon

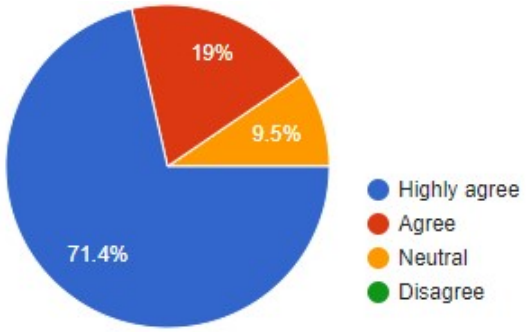
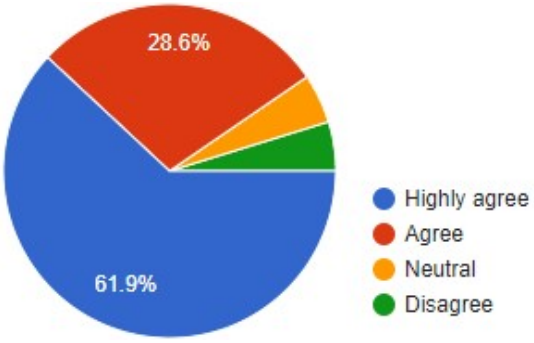
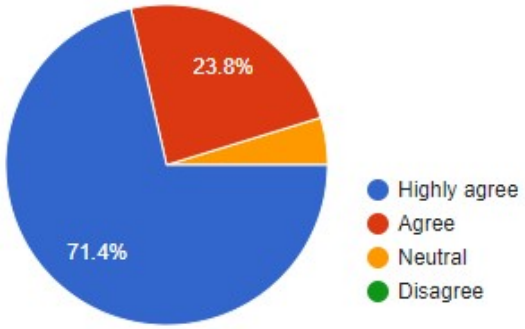


Figure 3.8 Agreement on the increasing demand for AIR graduates in Jordan and Lebanon



(a)



(b)

Figure 3.9. Impact of AIR programs on (a) attracting international companies (b) increasing the collaboration between academia and industry in Jordan and Lebanon

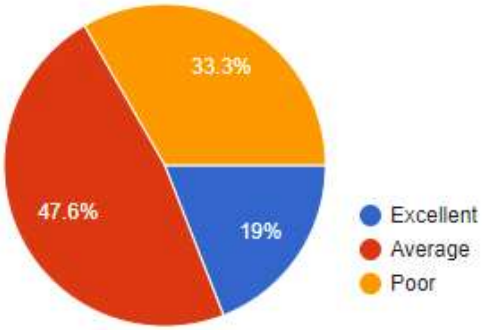


Figure 3.10. AIR Knowledge level of current graduates

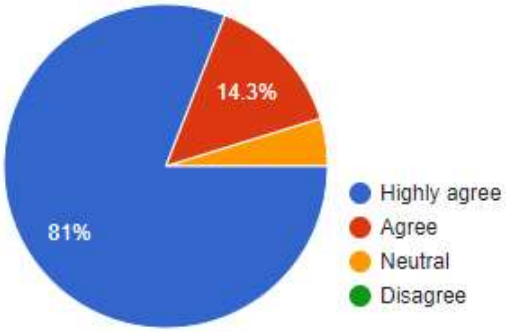


Figure 3.11. Agreement on the need to establish AIR programs/update existing programs

has direct impact on advancing the collaboration between the academia and local organizations in Jordan and Lebanon as this will help in solving their problems and advancing their products.

Nonetheless, around 81% of the respondents see that the AIR knowledge of current graduates in Jordan and Lebanon is at or below average level (Figure 3.10). This may reflect that there would be a growing gap between the demand for AIR graduates and what universities may provide in terms of quality and quantity. Hence, most respondents (95%) agree that universities in Jordan and Lebanon should establish specialized AIR programs and/or upgrade their existing programs to

incorporate significant AIR components in order to satisfy the projected growing demand on AIR graduates as depicted in Figure 3.11.

The last part of the survey asked the respondent to list the AIR-related skills and knowledge that the market expects graduates to have. Responses emphasized on the need for knowledge in programming, machine learning tools, computer vision, natural language processing, deep learning, automation and control, and data mining and analysis. On top of them, respondents stressed on the need of the hands on experience that can be built through project-based learning.

4. Student Survey Results

A total of 21 students filled the survey; 52% from Jordan, 43% from Lebanon and 5% from other countries. Around 48% were graduate students while 52% were undergraduate students. Participating students are pursuing degrees that are relevant to AIR. Figure 4.1 shows the distribution of the major of these students.

Most of the participating students (92%) indicated that they have prior knowledge in AIR. Mostly, they have obtained this knowledge from online courses and/or courses in the curriculum as shown in Figure 4.2. Among the responses, 14 participants stated that their current curriculum has one course in machine learning only while two participants mentioned robotics.

Based on the received responses, different teaching methodologies were used in delivering the taken AIR courses. It is clear in Figure 4.3 that using projects and assignments in teaching is less than 50%. The absence of specialized AIR labs or the insufficiency of existing labs to support AIR courses could be the main factors contributing to the infrequent use of hands-on methodologies in teaching AIR as shown in Figure 4.4. Also, Figure 4.5 shows the level of sufficiency for the AIR courses taken by the participants, where almost 43% either feel that the courses are not sufficient or they did not take courses in AIR previously.

Nonetheless, most of the participating students (67%) see that there is medium to high demand for graduates with skills in AIR in the local market as shown in Figure 4.6. Additionally, Figure 4.7 shows that most of the participants (95%) are in favor of establishing specialized AIR programs in their universities.

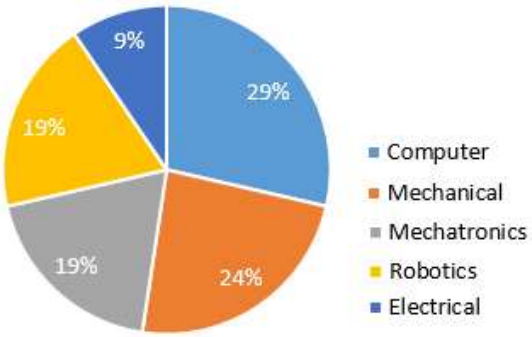


Figure 4.1. Major of participating students

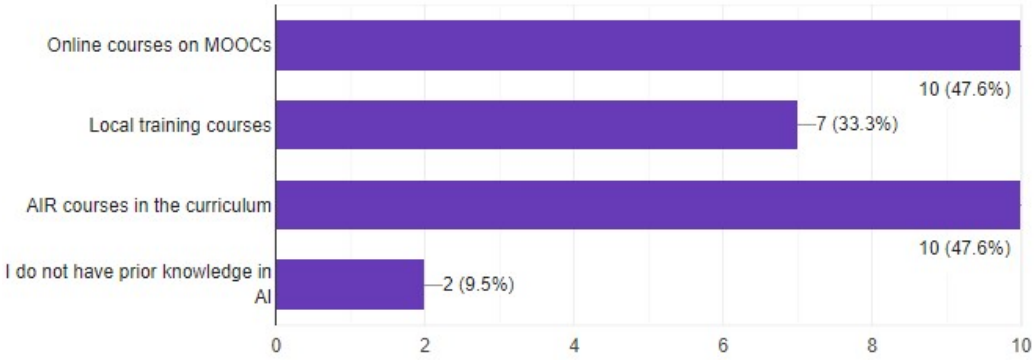


Figure 4.2. Source of AIR Knowledge

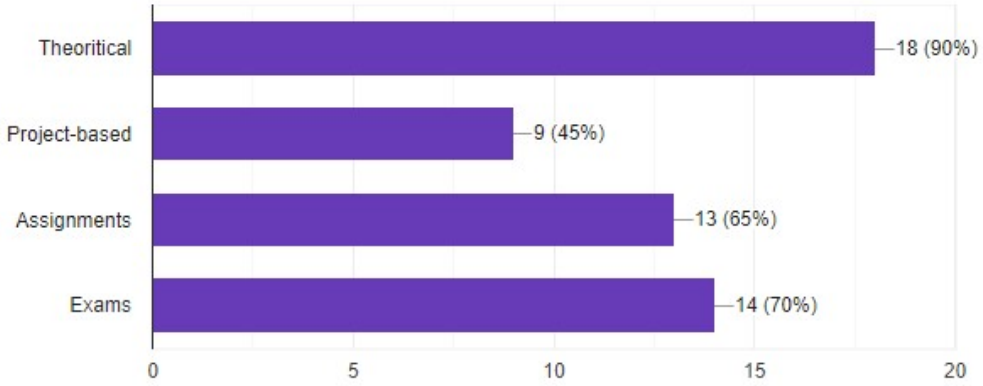


Figure 4.3. Teaching methodologies in taken AIR courses

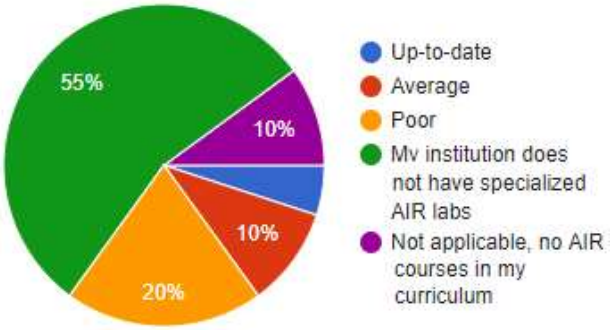


Figure 4.4. Quality of AIR labs

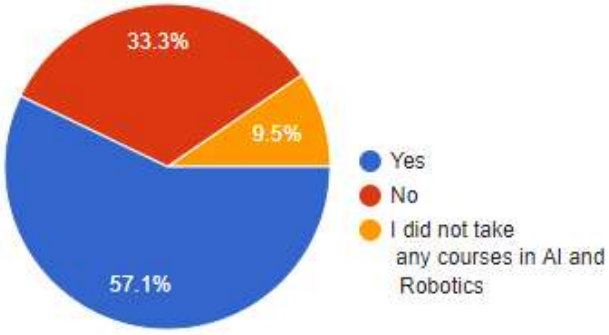


Figure 4.5. Sufficiency level taken AIR courses

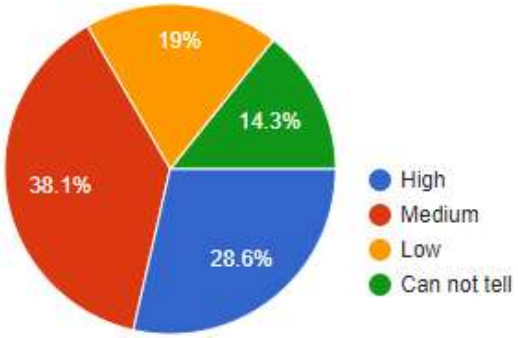


Figure 4.6. Demand on AIR graduates from students' perspective

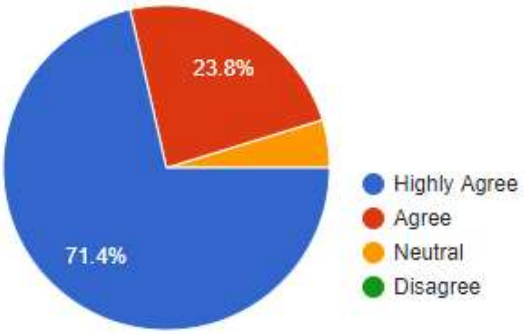


Figure 4.7. Agreement level on establishing specialized AIR programs

5. Instructor Survey Results

A total of 21 instructors filled the survey; 57% from Jordan, 38% from Lebanon and 5% from other countries. Participants were from different specializations including computer, electrical, mechanical and mechatronics engineering and computer science. All participants have prior experience in AIR; mostly, in doing research, while many of them have general AIR knowledge and/or teaching experience in AIR as shown in Figure 5.1. Their experience is in different domains related to AIR such machine learning, fuzzy logic, control systems and robotics.

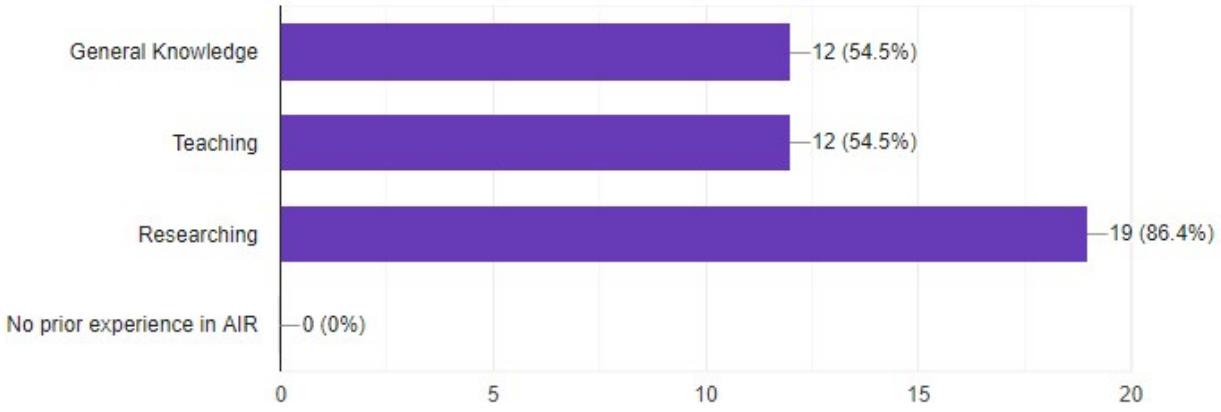


Figure 5.1. Instructors' experience in AIR

Most of the respondents reported that the curriculum that they teach has at least one course related to AIR such as introduction to machine learning, neural networks and fuzzy logic, introduction to robotics, control systems and sensing. For those who taught AIR related courses, they have used different types of assessment tools as shown in Figure 5.2.

Nonetheless, Figure 5.3 shows that most of the participants believe that the lack of equipment and the lack of expertise are the main obstacles for teaching AIR courses. Also, 65% of the participants reported that their existing curriculum needs minor or major update in terms of AIR content, while 25% reported that they have already started updating their curriculum (Figure 5.4).

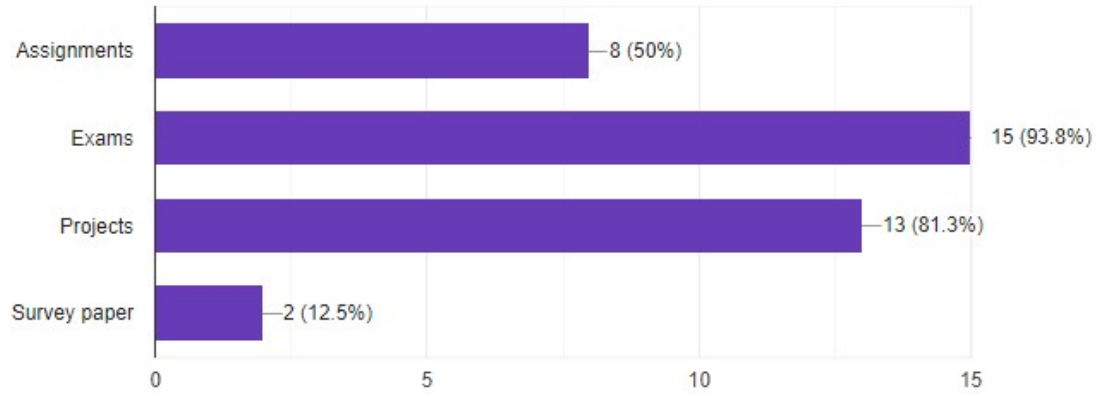


Figure 5.2. Assessment tools used by instructors

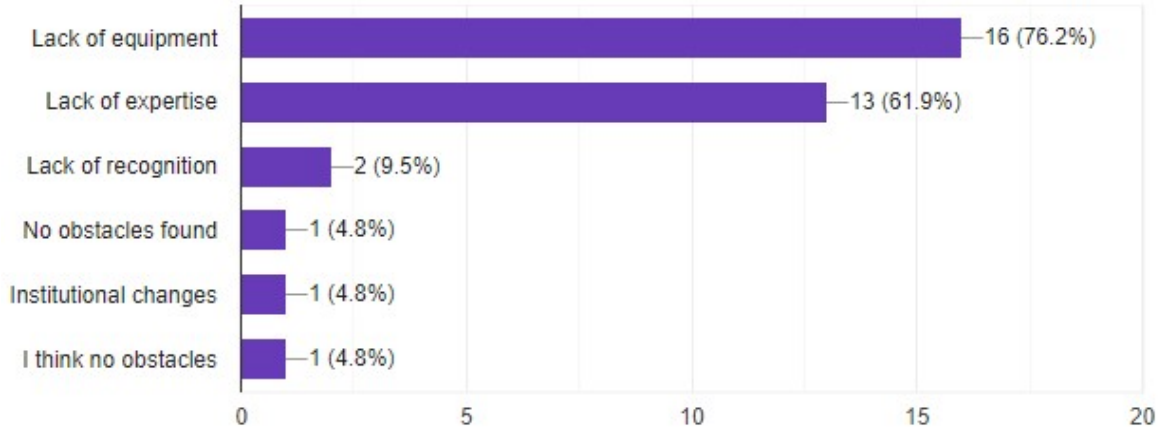


Figure 5.3. Obstacles in teaching AIR courses

For the purpose of updating existing curricula in order to cope with need for graduates with AIR expertise, the participants listed several AIR courses to be included in the curricula. These are listed in Table 5.1. Additionally, and in order to support AIR courses in the curricula, participants listed different types of equipment and software tools which are listed in Table 5.2. Generally, most of the responses required the availability high performance workstations with GPUs to support AI and data science. Additionally, robotics kits, arms and manipulators were also listed as required items to support robotics topics.

To address the lack of expertise in AIR, participants listed several topics in which they look for receiving training in. Some of the responses were general in nature while others were specific. A short list of the requested topics is given in Table 5.3.

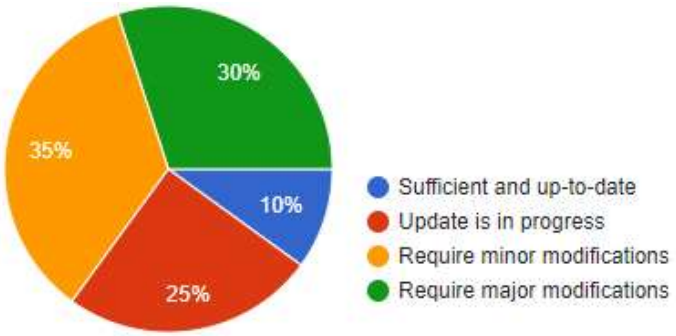


Figure 5.4. Current status of AIR curriculum

Table 5.1. List of Suggested Courses to Include in Curricula

Artificial Intelligence	▪ Introduction to Machine Learning ▪ Optimization ▪ Deep Learning ▪ Advanced AI ▪ Machine Vision ▪ Natural Language Processing ▪ Reinforcement Learning ▪ Federated Learning ▪ Feature Engineering
Data Science	▪ Data Mining ▪ Big Data Analytics ▪ Bioinformatics
Robotics	▪ Introduction to Robotics ▪ Modeling and Simulation in Mechatronics ▪ Concepts of Automatic Control ▪ Internet of Things ▪ Sensing, Actuation, & Navigation in Robots ▪ Serial Manipulators: Modeling & Simulation ▪ Parallel Manipulators: Modeling & Simulation ▪ Autonomous Systems ▪ Bio-robotics
Other	▪ Algorithms ▪ Programming ▪ Signal Processing ▪ Image Processing

In terms of the impact of the availability of academic programs in AIR, around 84% of the participants agree with the fact that qualifying students in AIR will improve the employability. Additionally, there was a high level of agreement between participants on the positive impact of enhancing their AIR skills and the availability of the necessary AIR infrastructure in different

Table 5.2. List of Equipment and Tools

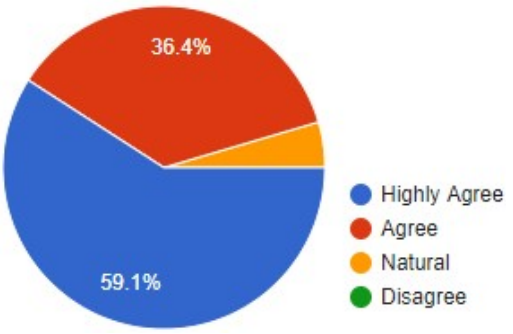
▪ GPU accelerated workstations ▪ High-performance computers for AI ▪ Drones ▪ Robots, Mission Planners, autonomous robots, simulation tools ▪ Articulated Robots, Mobile Robots, UAVs ▪ Multi-DOF Industrial & Mobil Robots ▪ 3D Printers ▪ Robot Operating System (ROS) ▪ Robotics Kits ▪ AI-equipped robots

Table 5.3. List of Training Topics

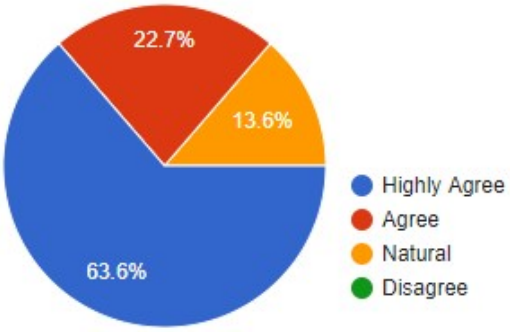
▪ Machine learning ▪ Deep learning ▪ Time series prediction ▪ Applications of ML techniques in communication systems ▪ High computing hardware for AI ▪ Data analysis and coding AI algorithms ▪ Federated Learning ▪ Natural Languages processing ▪ Big data analysis ▪ Control Concepts ▪ Serial Manipulators ▪ Parallel Manipulators ▪ Drives and Automation

aspects, such as advancing research, collaborating with industry, securing funds and creating interdisciplinary research. Figure 5.5 shows the level of agreement on these aspects.

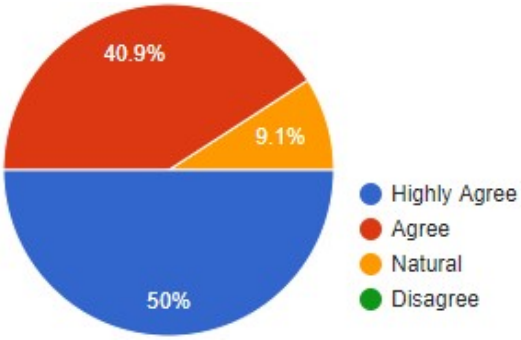
Given all AIR obstacles and the impact of AIR as recognized by the instructors, Figure 5.6 shows that around 96% of the participants reported that there is a need to establish specialized AIR programs in Jordan and Lebanon, and all of them supported the fact that developing such programs in collaboration with European institutions would help in improving the quality of the programs and their graduates as shown in Figure 5.7.



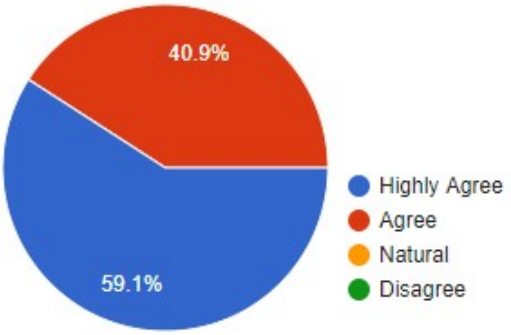
Advancing Research



Collaboration with Industry



Securing Funds



Enhancing Interdisciplinary Research

Figure 5.5. Level of agreement among participants on the impact of AIR

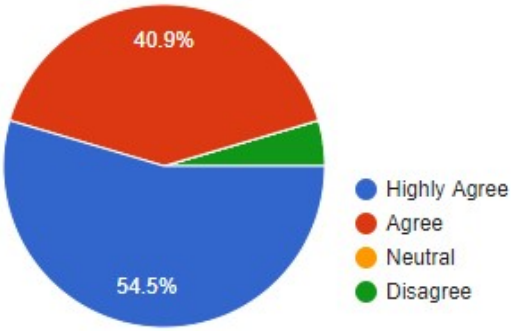


Figure 5.6. Level of agreement on establishing AIR programs

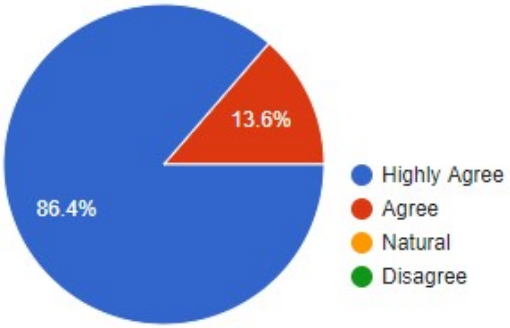


Figure 5.7. Level of agreement in collaborating with European institution to establish/update AIR programs

Appendix A
Stakeholders Survey

Surveying the needs for AI and Robotics expertise and professionals in Jordan and Lebanon

Dear respondent;

This survey is implemented within the framework of the Erasmus+ project “DeCAIR: Developing Curricula for Artificial Intelligence and Robotics”. The project is aiming to improve existing computer, mechatronics, electrical, and mechanical engineering master’s and bachelor's programs in the areas of AI and robotics (AIR). Additionally, DeCAIR will establish new master’s program in AIR at University of Jordan, new bachelor's program in AIR at Tafila Technical University, and new track in AIR at Beirut Arab University. This will lead to graduating students able to meet the rising market demands for experts who can use AIR technologies to develop products and solve various problems facing modern societies.

We warmly ask you to spend around 10 minutes to answer the following questions. Your contribution is valuable for the achievement of the DeCAIR project objectives.

* Required

Participant Category

1. Please select your category *

Mark only one oval.

- ◯ Student *Skip to question 25*
- ◯ Instructor *Skip to question 39*
- ◯ Enterprise / Governmental Agency / Professional Organization

Enterprise / Governmental Agency / Professional Organization Survey

2. Name

_____

3. Email address

_____

4. Country

Mark only one oval.

- ◯ Jordan
- ◯ Lebanon
- ◯ Other: _____

5. Affiliation

_____

6. Main Activities/Products/Services

_____

7. Previous experience related to AIR

Check all that apply.

- ☐ Research
- ☐ Development
- ☐ Team member of AIR project
- ☐ Team Leader of AIR project
- Other: ☐ _____

8. For how many years have you been working in the AIR field?

Mark only one oval.

- 0
- 1-3
- 3-5
- More than 5

Adoption of AIR in organizations located in Jordan/Lebanon

9. How would you rate the adoption to AIR in your organization?

Mark only one oval.

- No plans for adoption
- Adopted AIR but still in the early stages
- Have been adopting AIR for more than 5 years

10. How do you think that adopting AIR will affect your organization activities?

Check all that apply.

- Improve the efficiency of current products
- Open the domain for new products
- Speedup the workflow in the company
- Other: _____

11. In your opinion, what are the key challenges/ impediments for AIR development and adoption in your organization?

Mark only one oval.

- Lack of Funding
- Lack of expertise
- Low recognition of the added value of AIR
- The management does not believe that AIR is important in the company working field
- None

12. What is the number of tech employees with knowledge/skills in the AIR domain in your organization?

Mark only one oval.

- 0
- 1-5
- 6-10
- 10-15
- 15-20
- More than 20

13. Did your organization take a forward step in developing the employees skills set in the field(s) of AIR in the last 5 years?

Mark only one oval.

- Yes
- No
- Not Applicable

14. Does your organization have a training strategy for the current employees in AIR?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Not Applicable

15. What are the techniques your organization is using to build capacity in the AIR domain?

Check all that apply.

- ☐ Hiring experts in AIR
- ☐ Training current employees
- ☐ Hiring fresh University graduates
- ☐ Not Applicable

Role of Universities in Jordan/Lebanon in strengthening the adoption of AIR?

16. How would you rate the adoption of AIR in Jordan/Lebanon?

Mark only one oval.

- ◯ High
- ◯ Medium
- ◯ Low

17. Do you agree that the demand for skillful graduates in the AIR domain will increase in the coming years?

Mark only one oval.

- Highly agree
- Agree
- Neutral
- Disagree

18. Do you agree that the availability of skillful graduates and professionals in the field of AIR will attract international companies to establish regional offices in Jordan/Lebanon?

Mark only one oval.

- Highly agree
- Agree
- Neutral
- Disagree

19. Do you think that having an up-to-date and well-equipped undergraduate and graduate programs will play a main role in improving collaboration between public/private sectors and the universities in Jordan/Lebanon?

Mark only one oval.

- Highly agree
- Agree
- Neutral
- Disagree

20. How would you rate the knowledge of university graduates in the AIR domain?

Mark only one oval.

- Excellent
- Average
- Poor

21. Do you agree that the universities should establish/upgrade AIR related programs to cover the increased demand in the AIR domain?

Mark only one oval.

- Highly agree
- Agree
- Neutral
- Disagree

22. In your opinion, which sectors do you believe will benefit from the improvement in the AIR programs in Jordan/Lebanon? *

Mark only one oval per row.

	Highly Agree	Agree	Neutral	Disagree
Manufacturing Quality				
Control Systems				
Agriculture				
Healthcare				
Pharmacy				
Education				
Management				
Security				

23. Based on your expertise, what are the AIR topics and related skills that university graduates should have to increase their employability in the field?

24. Other Comments

Student Survey

25. Name

_____

26. Email

_____

27. University/College

_____

28. Country

Mark only one oval.

- ◯ Jordan
- ◯ Lebanon
- ◯ Other: _____

29. Major

_____

30. Level of Study

Mark only one oval.

- ◯ Undergraduate
- ◯ Graduate

31. What is the main source of your AI knowledge?

Check all that apply.

- [ ] Online courses on MOOCs
- [ ] Local training courses
- [ ] AIR courses in the curriculum
- [ ] I do not have prior knowledge in AI

32. If your curriculum contains courses in AI and Robotics, then please list the names of these courses.

_____

33. If you took any courses in AI and Robotics, were they sufficient and up-to-date?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ I did not take any courses in AI and Robotics

34. What were the teaching methodologies in the AIR courses that you took?

Check all that apply.

- [ ] Theoritical
- [ ] Project-based
- [ ] Assignments
- [ ] Exams

Other: [ ] _____

35. How would you rate the lab equipment that is available in your institution to support the AIR courses in your curriculum?

Mark only one oval.

- Up-to-date
- Average
- Poor
- My institution does not have specialized AIR labs
- Not applicable, no AIR courses in my curriculum

36. How do you rate the demand of graduates with sufficient knowledge in AIR in your country?

Mark only one oval.

- High
- Medium
- Low
- Can not tell

37. Do you agree that the universities in your country should open specialized programs in AI and Robotics?

Mark only one oval.

- Highly Agree
- Agree
- Neutral
- Disagree

38. Other Comments

Instructor Survey

39. Name

40. Email

41. Institution

42. Department

43. Country

Mark only one oval.

- Jordan
- Lebanon
- Other:

Untitled Section

44. What is your experience in AI and Robotics?

Check all that apply.

- [ ] General Knowledge
- [ ] Teaching
- [ ] Researching
- [ ] No prior experience in AIR

45. If you have prior experience in AI and Robotics, then please specify your experience domain.

_____

46. Does your curriculum contain courses on AI and Robotics? If yes, please list the names of these courses.

_____

_____

_____

_____

_____

47. If you taught AIR courses before, then what tools did you use for assessment?

Check all that apply.

- [ ] Assignments
- [ ] Exams
- [ ] Projects
- [ ] Survey paper

48. In your opinion, what are the obstacles of teaching AIR courses in your institution?

Check all that apply.

- [ ] Lack of equipment
- [ ] Lack of expertise
- [ ] Lack of recognition
- [ ] Other: _____

49. What is the status of AI and Robotics courses in your curriculum?

Mark only one oval.

- ◯ Sufficient and up-to-date
- ◯ Update is in progress
- ◯ Require minor modifications
- ◯ Require major modifications

50. In your opinion, what courses and labs should be included in the curricula of AI and Robotics related programs?

_____

_____

_____

_____

_____

51. In your opinion, what equipment should be available to support AI and Robotics related programs?

_____

_____

_____

_____

_____

52. If you are offered to get training courses in AI and Robotics, what topics would be of greatest importance and interest to you?

53. Do you agree that qualifying students in AI and Robotics will increase their employability?

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

54. Do you agree that enhancing AI and Robotics skills of students and faculty members and supporting them with specialized equipment/labs will result in practical research and projects which solve real life problems?

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

55. Do you agree that qualifying faculty members in AI and Robotics will open the door to collaborate with the industry to solve their problems?

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

56. Do you agree that qualifying faculty members in AI and Robotics may help them in securing research funds from different national and international funding agencies?

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

57. Do you agree that qualifying faculty members in AI and Robotics may create opportunities for interdisciplinary research projects (i.e. apply AI and Robotics in the field of medicine, agriculture, pharmacy etc..)

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

58. Do you agree that the universities in your country should open specialized programs in AI and Robotics?

Mark only one oval.

- Highly Agree
- Agree
- Neutral
- Disagree

59. Do you agree that the collaboration with the European universities specialized in AI and Robotics would help in improving the quality of the AI and Robotics programs in terms of teaching and preparing high quality graduates?

Mark only one oval.

- Highly Agree
- Agree
- Natural
- Disagree

60. Other comments

Appendix B
Survey Results

Surveying the needs for AI and Robotics expertise and professionals in Jordan and Lebanon

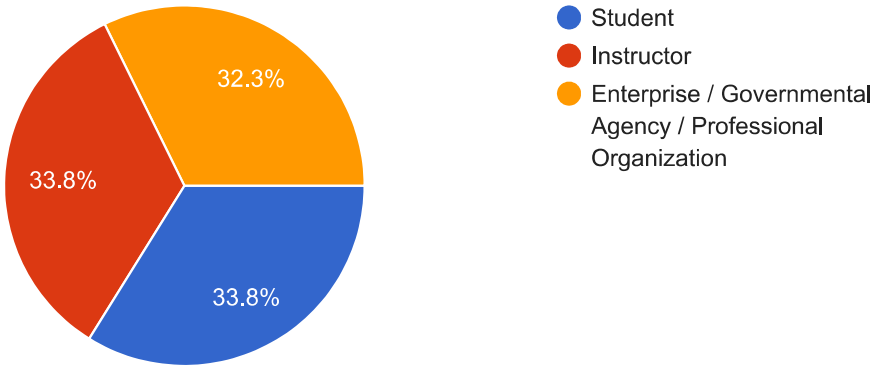
65 responses

Publish analytics

Participant Category

Please select your category

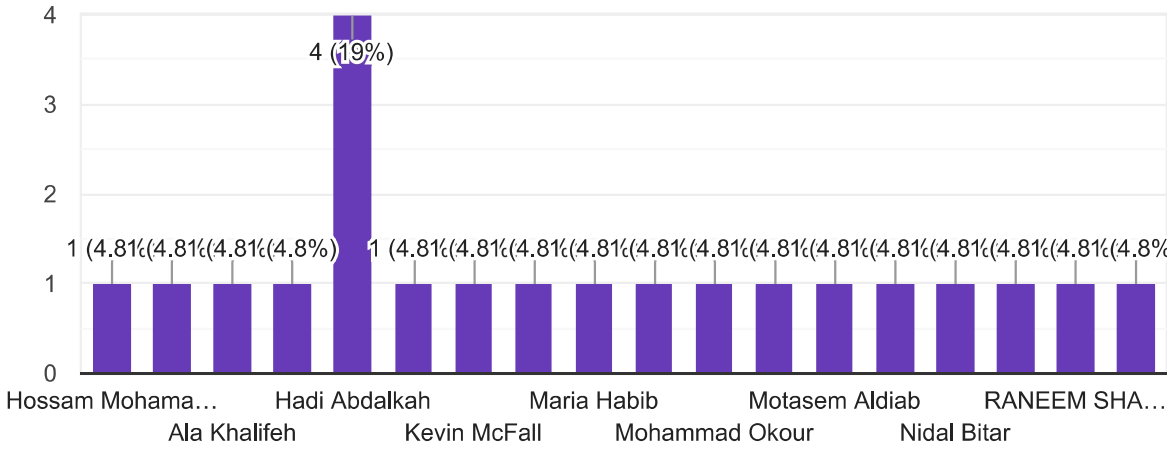
65 responses



Enterprise / Governmental Agency / Professional Organization Survey

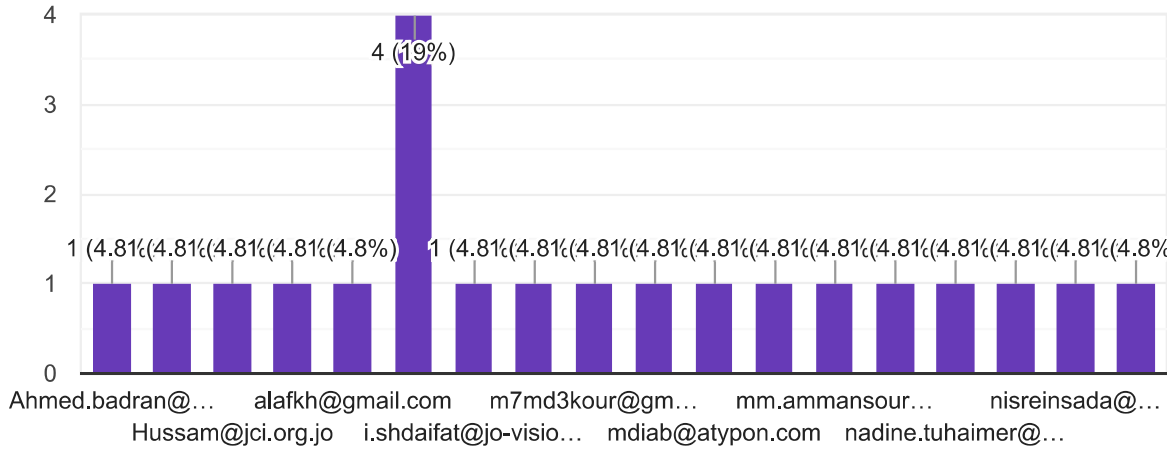
Name

21 responses



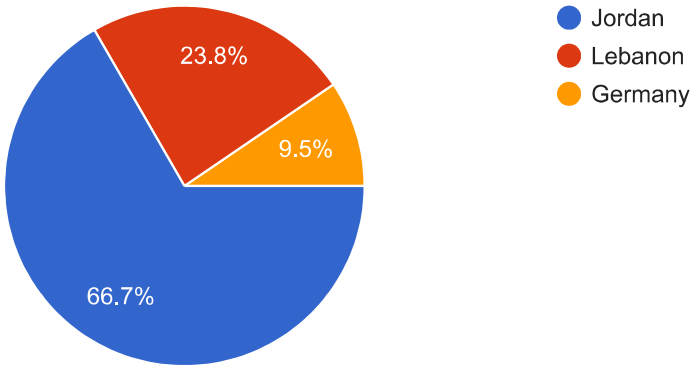
Email address

21 responses



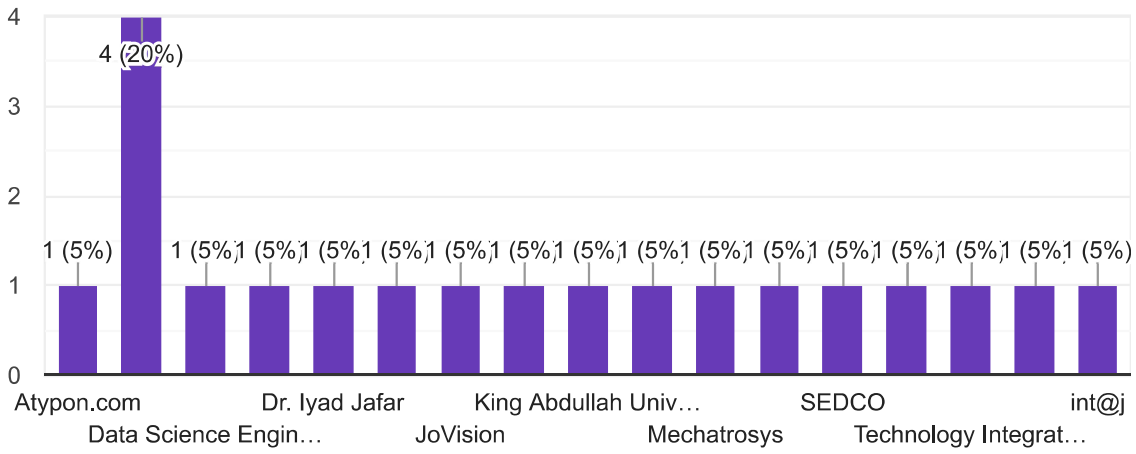
Country

21 responses



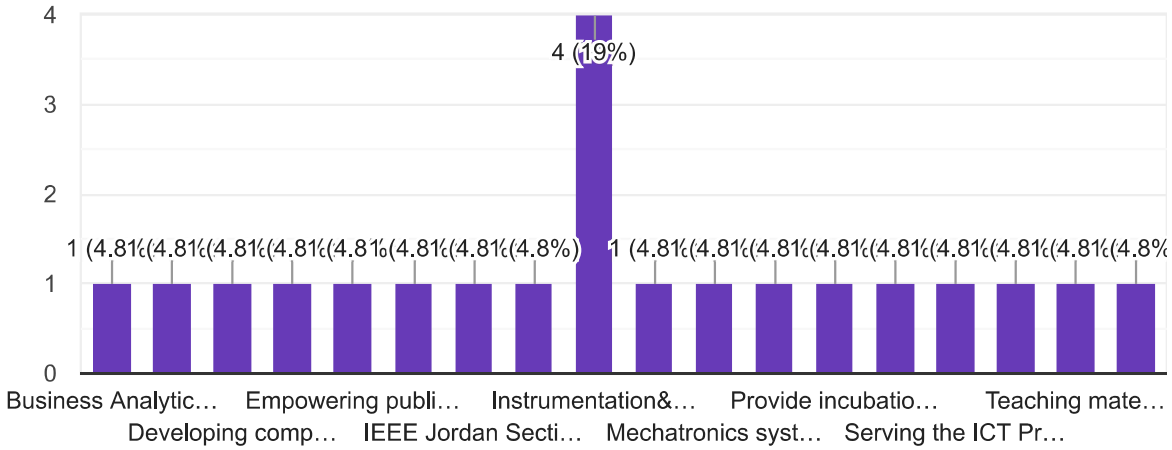
Affiliation

20 responses



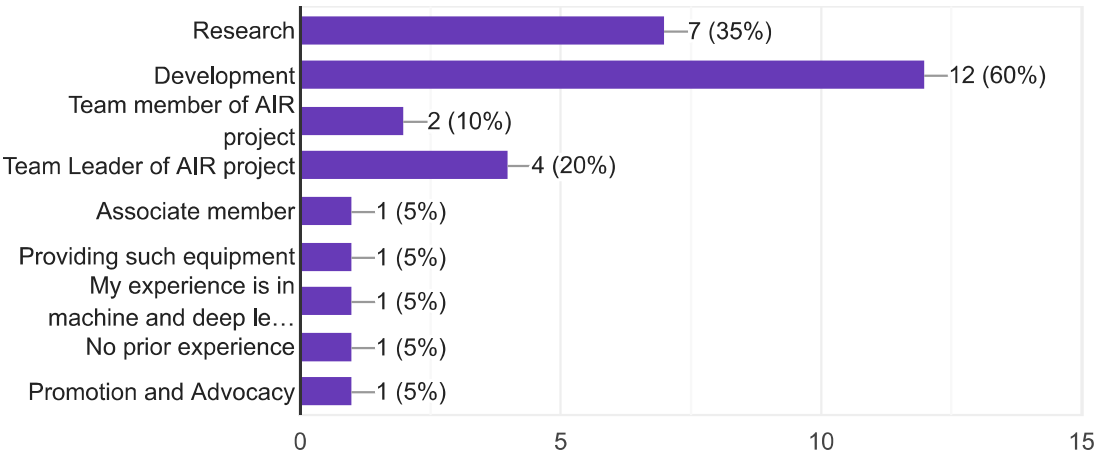
Main Activities/Products/Services

21 responses



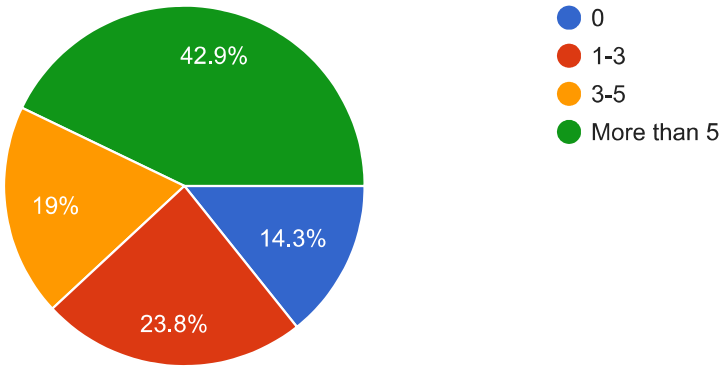
Previous experience related to AIR

20 responses



For how many years have you been working in the AIR field?

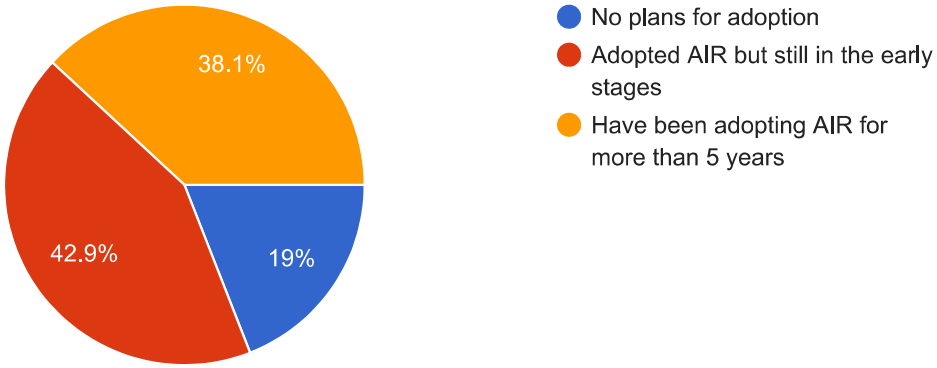
21 responses



Adoption of AIR in organizations located in Jordan/Lebanon

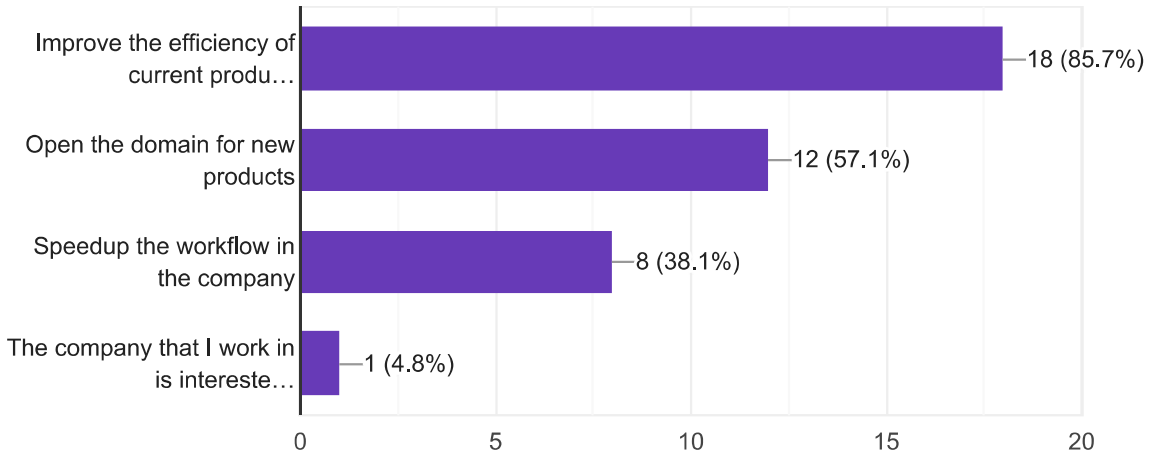
How would you rate the adoption to AIR in your organization?

21 responses



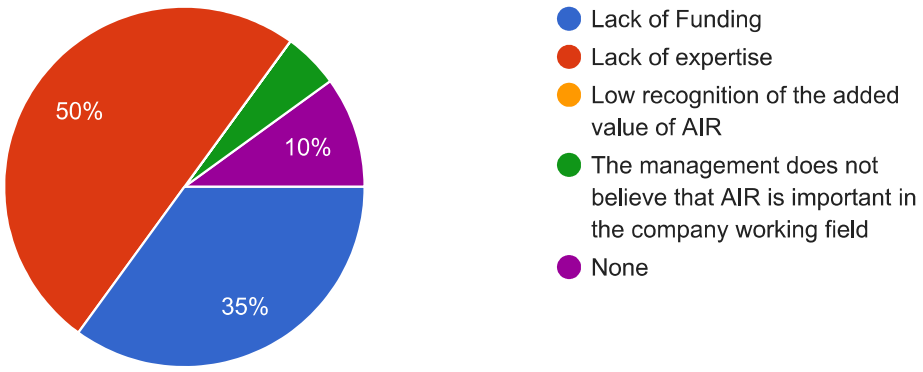
How do you think that adopting AIR will affect your organization activities?

21 responses



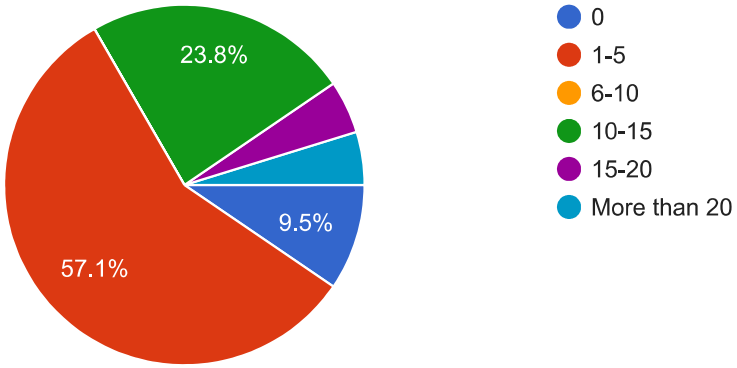
In your opinion, what are the key challenges/ impediments for AIR development and adoption in your organization?

20 responses



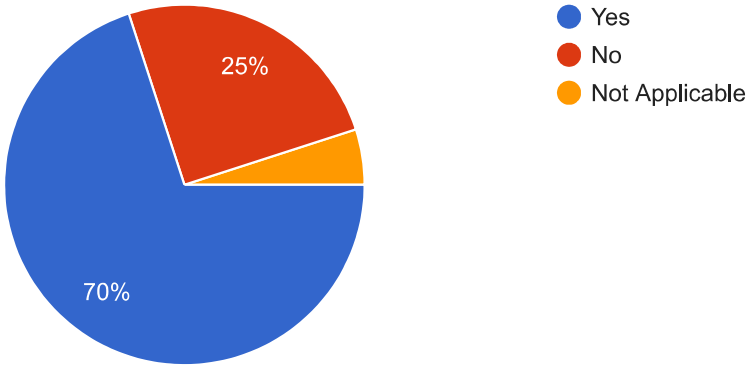
What is the number of tech employees with knowledge/skills in the AIR domain in your organization?

21 responses



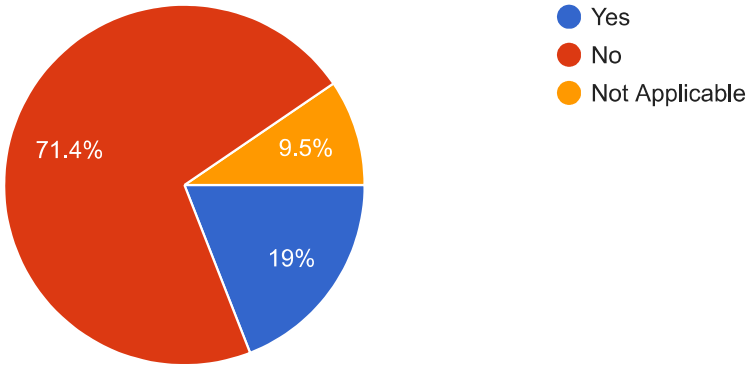
Did your organization take a forward step in developing the employees skills set in the field(s) of AIR in the last 5 years?

20 responses



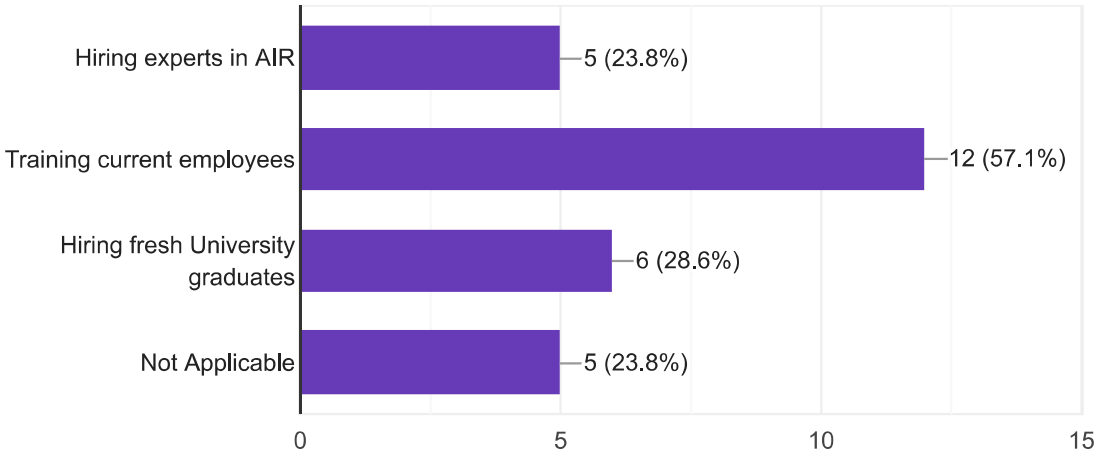
Does your organization have a training strategy for the current employees in AIR?

21 responses



What are the techniques your organization is using to build capacity in the AIR domain?

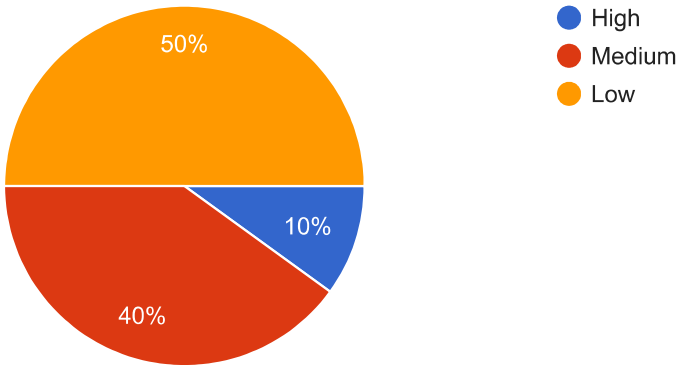
21 responses



Role of Universities in Jordan/Lebanon in strengthening the adoption of AIR?

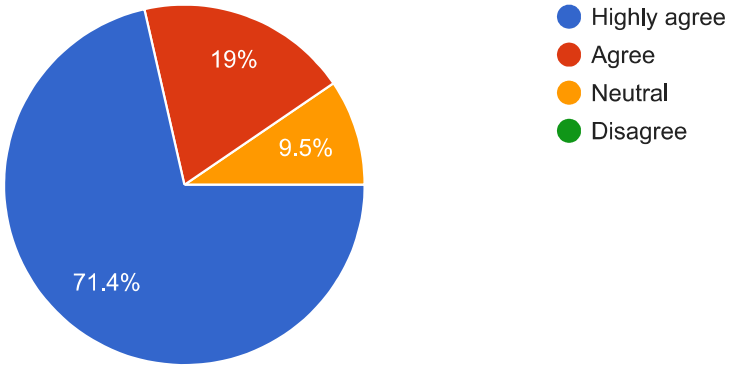
How would you rate the adoption of AIR in Jordan/Lebanon?

20 responses



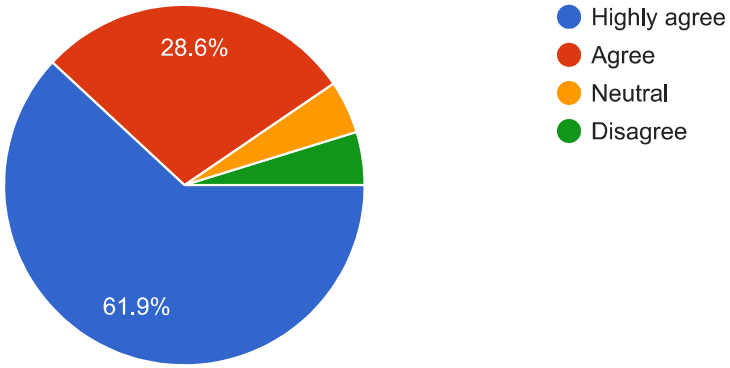
Do you agree that the demand for skillful graduates in the AIR domain will increase in the coming years?

21 responses



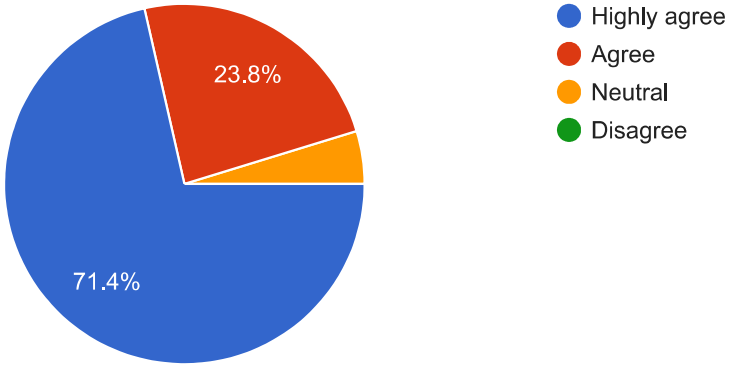
Do you agree that the availability of skillful graduates and professionals in the field of AIR will attract international companies to establish regional offices in Jordan/Lebanon?

21 responses



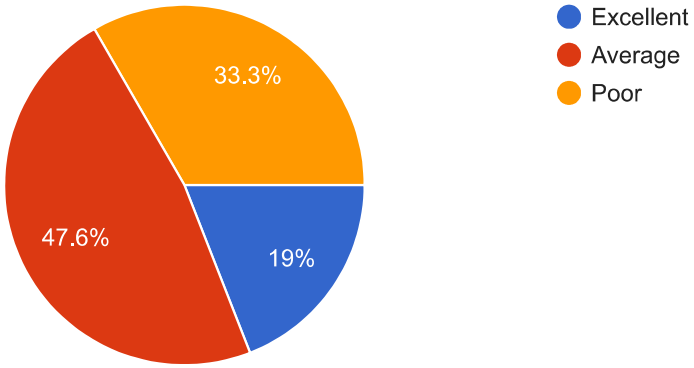
Do you think that having an up-to-date and well-equipped undergraduate and graduate programs will play a main role in improving collaboration between public/private sectors and the universities in Jordan/Lebanon?

21 responses



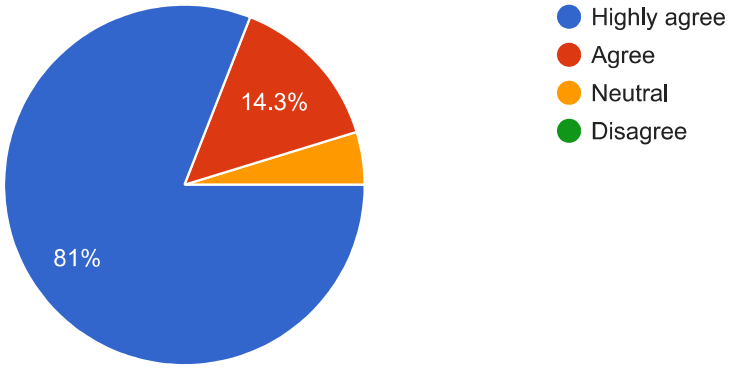
How would you rate the knowledge of university graduates in the AIR domain?

21 responses

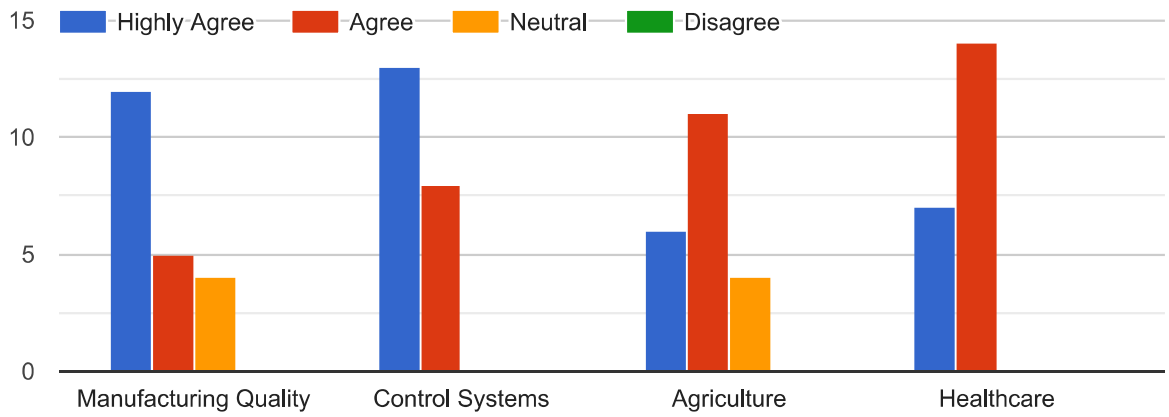


Do you agree that the universities should establish/upgrade AIR related programs to cover the increased demand in the AIR domain?

21 responses



In your opinion, which sectors do you believe will benefit from the improvement in the AIR programs in Jordan/Lebanon?



Based on your expertise, what are the AIR topics and related skills that university graduates should have to increase their employability in the field?

17 responses

Decision making algorithms/Computer vision/Mdern Automation/Quality control base technic

X

programming

Any of them. There is great demand for this in industry across the board. From my experience from an undergraduate Mechatronics Engineering program, students are most commonly hired because of their ability to advance industrial automation.

More hand on experience to be able to bridge between theory and practice

Machine Learning, Natural Language Processing, Computer Vision

Data analysis, data mining, big data tools, business understanding or collaboration with companies to apply these tools in real life

Other Comments

5 responses

Feel free to reach out to me if there are any way NVIDIA can contribute to your project.

I highly encourage and recommend starting this graduate-level master program.

Practice at least 50% not only theory

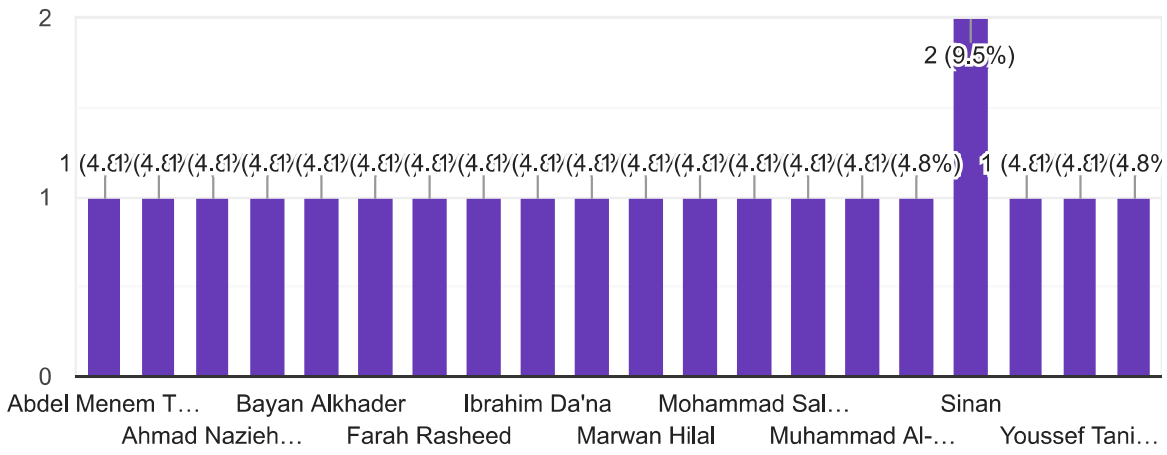
Students needs more intensive internship programs before graduation.

Well done and thanks for your great efforts...
My recomendation is that it is important to invest in up skilling the faculty members in universities to deliver up to date curricula for students

Student Survey

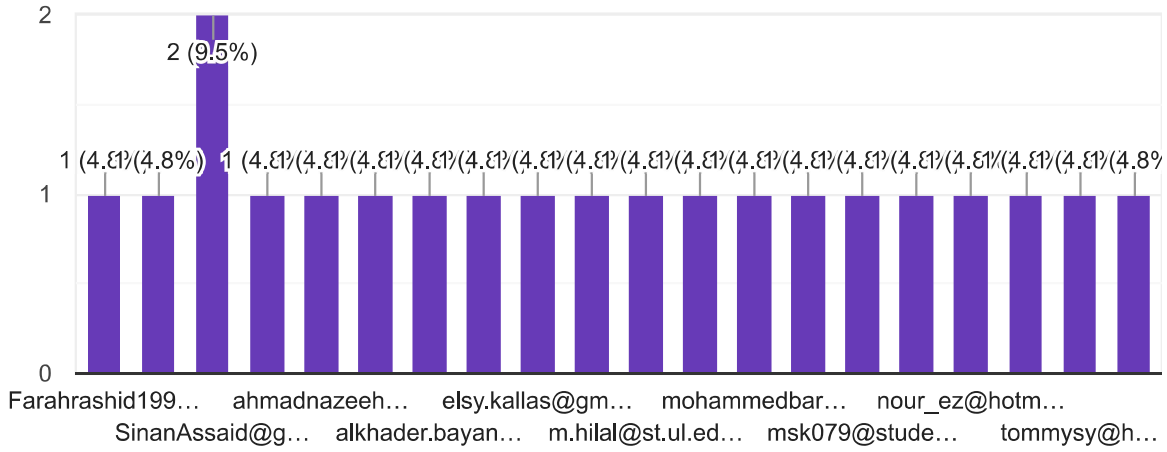
Name

21 responses



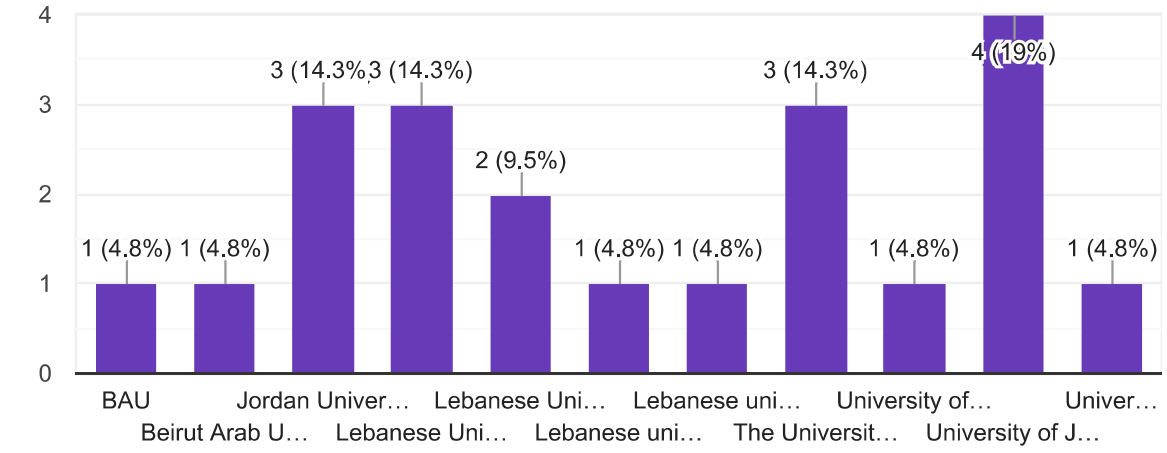
Email

21 responses



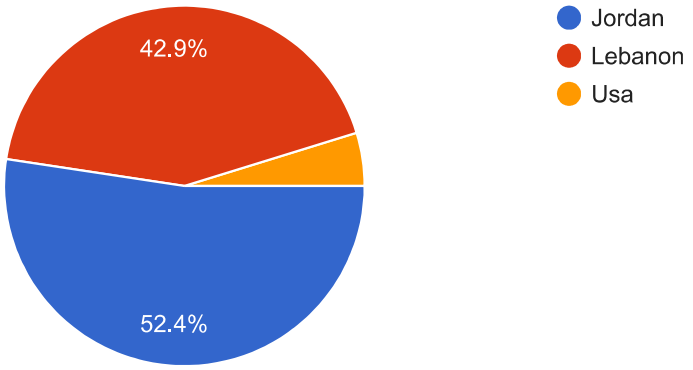
University/College

21 responses



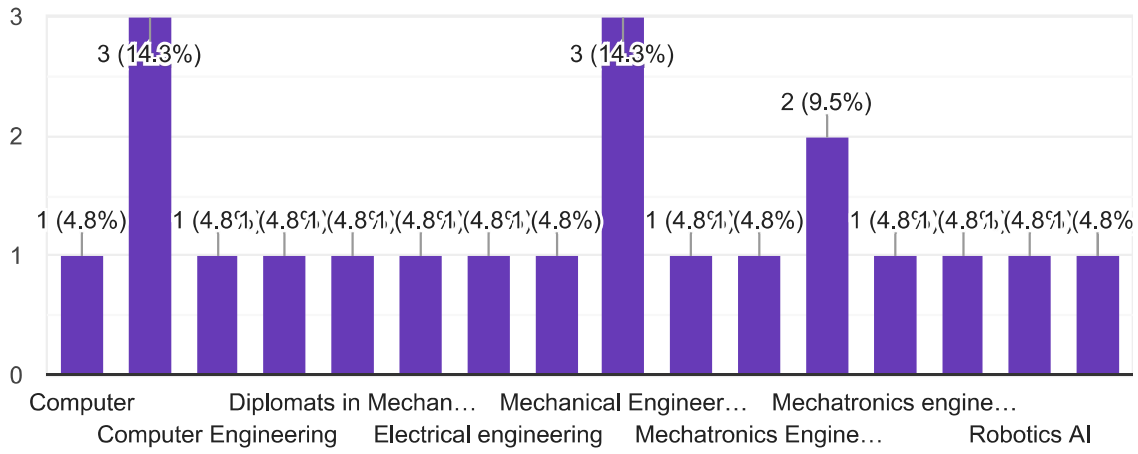
Country

21 responses



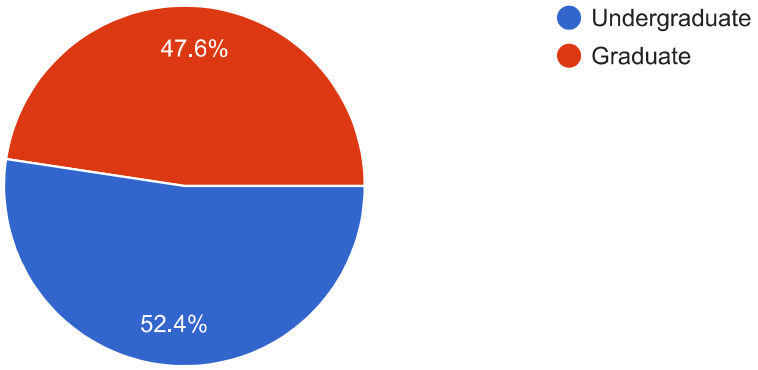
Major

21 responses



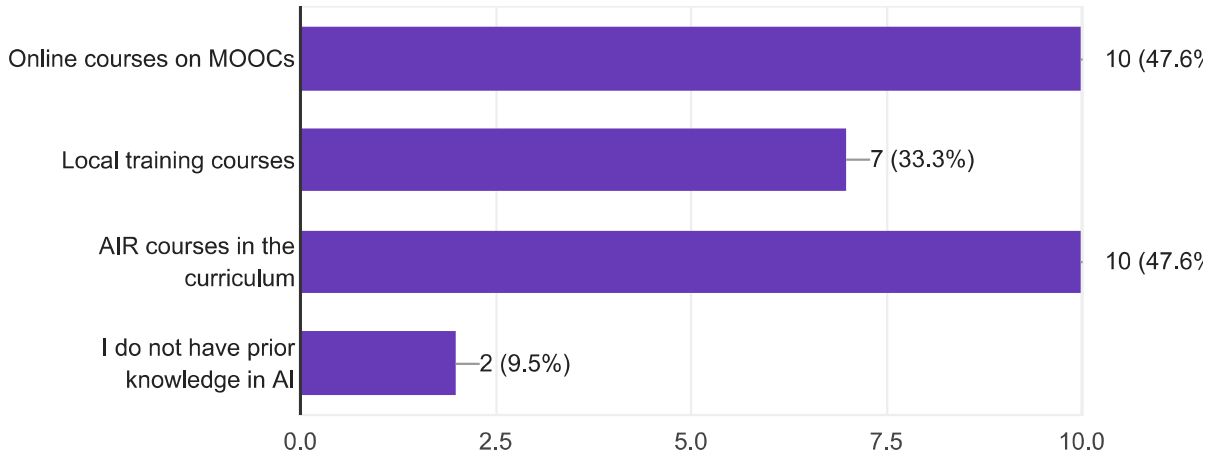
Level of Study

21 responses



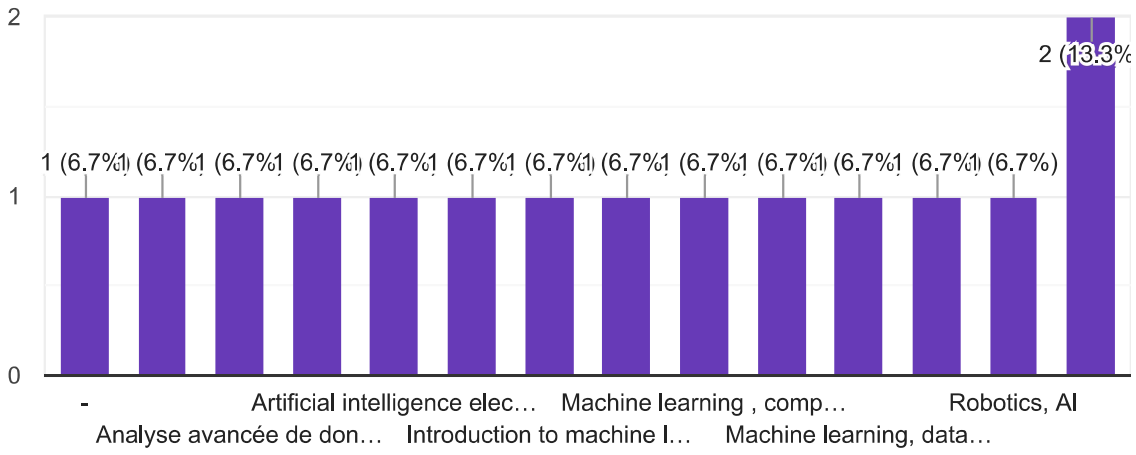
What is the main source of your AI knowledge?

21 responses



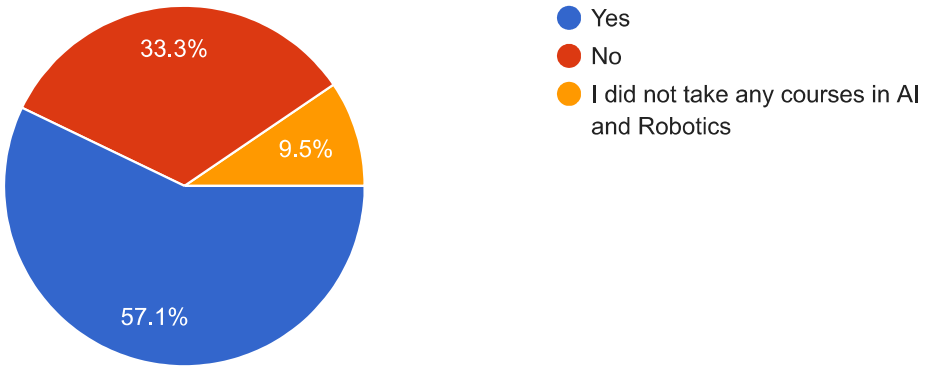
If your curriculum contains courses in AI and Robotics, then please list the names of these courses.

15 responses



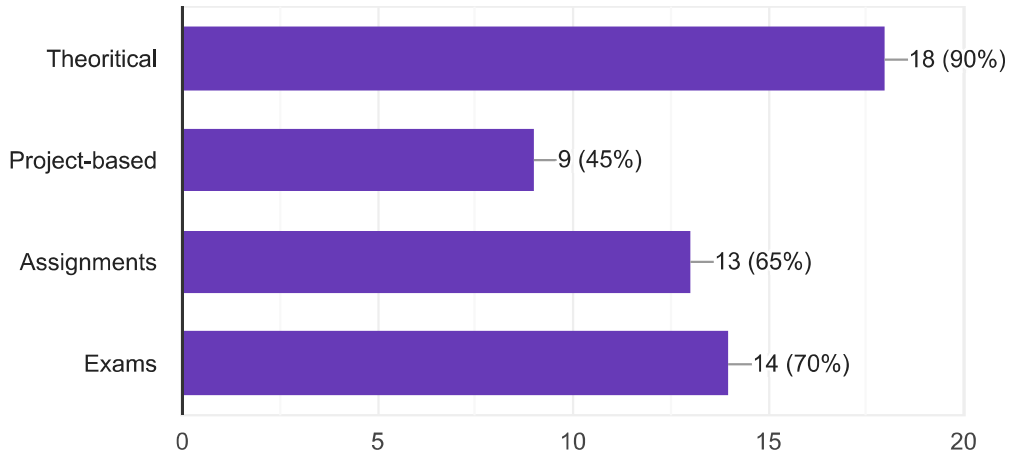
If you took any courses in AI and Robotics, were they sufficient and up-to-date?

21 responses



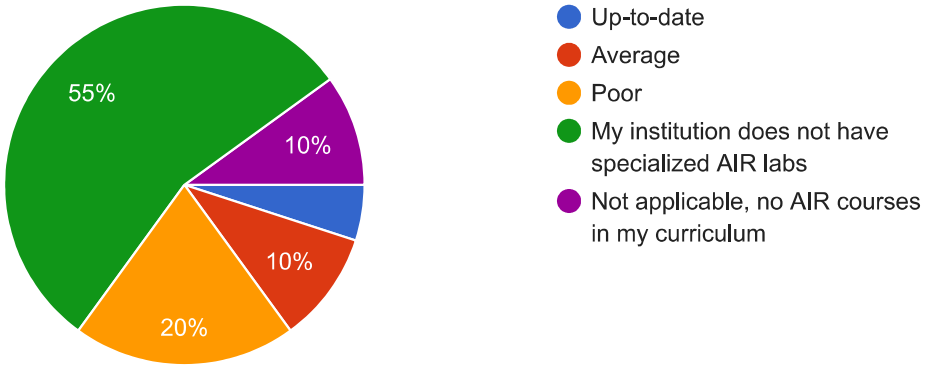
What were the teaching methodologies in the AIR courses that you took?

20 responses



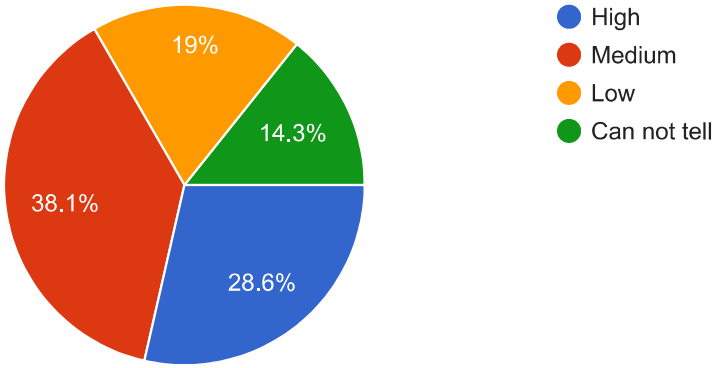
How would you rate the lab equipment that is available in your institution to support the AIR courses in your curriculum?

20 responses



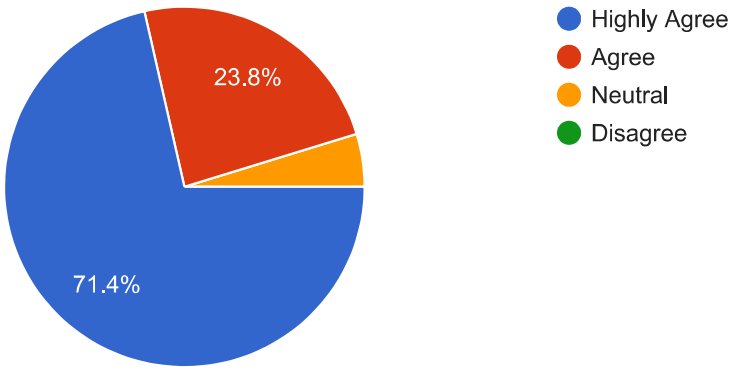
How do you rate the demand of graduates with sufficient knowledge in AIR in your country?

21 responses



Do you agree that the universities in your country should open specialized programs in AI and Robotics?

21 responses



Other Comments

6 responses

Robotics is taught from a mechanical engineering perspective rather than systems engineering and is more focused on mathematical theoretical procedures rather than an applied practical approach and that is wrong and irrelevant to the job market.

I am not sure about other universities, or even if people can learn in universities these days because of the economical crisis.

Thank your for this kind invitation

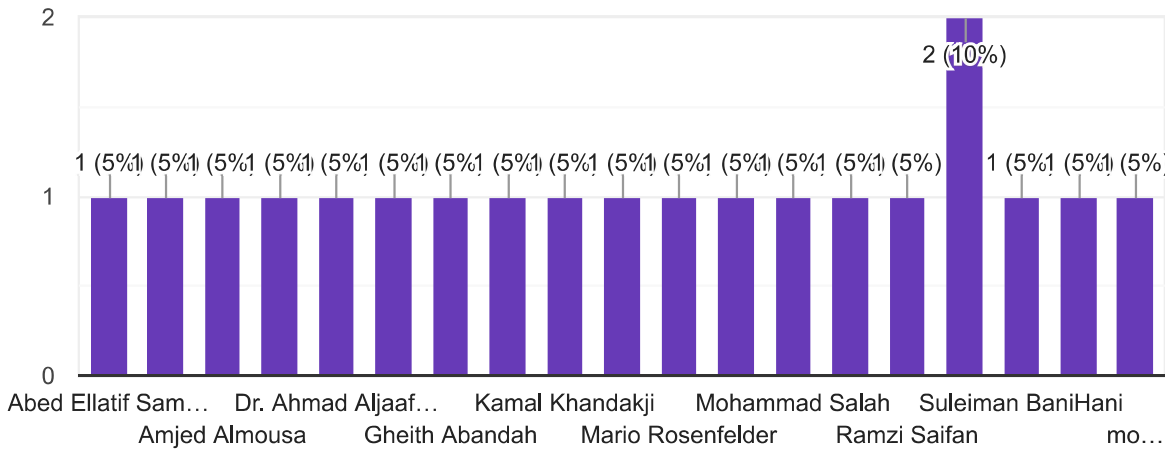
Thank you for this workshop, it was really informative and important. We hope to meet again, for open discussions, webinars and even collaborative researches/projects between the universities in Lebanon and Jordan. God bless your efforts.

I think there should be more talk about AIR during the introductory computer courses of the university to help students see the reasons behind the hype early on in their studies and get excited to form communities and clubs to learn more about the topics.

Instructor Survey

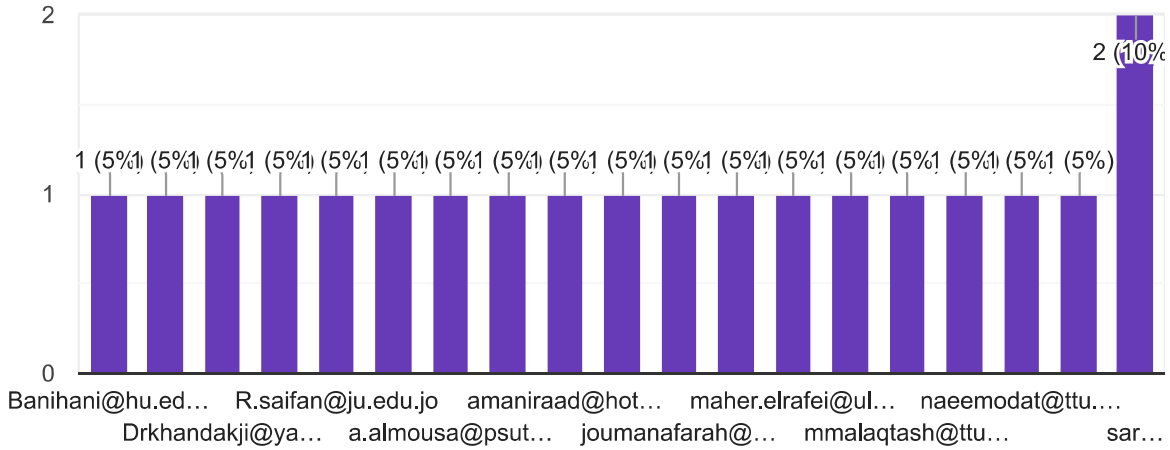
Name

20 responses



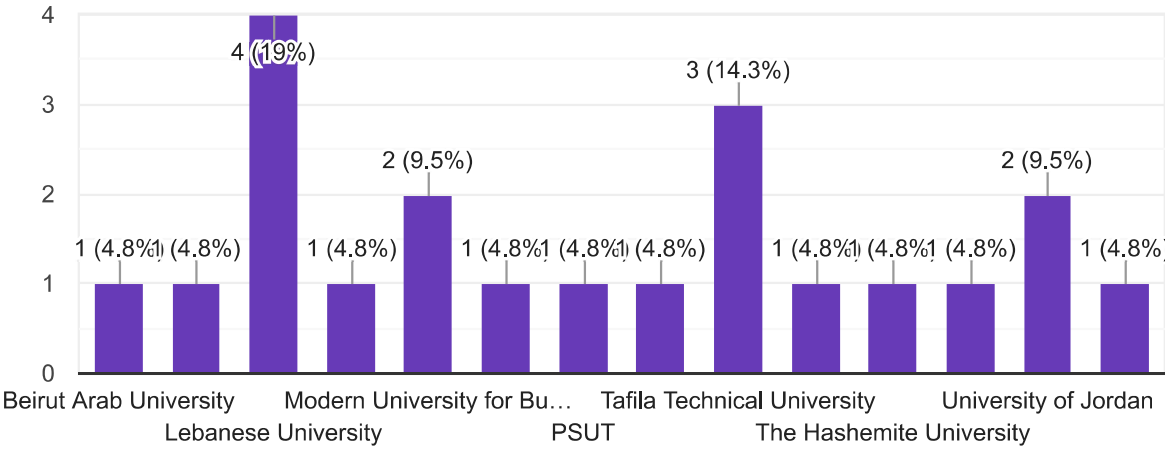
Email

20 responses



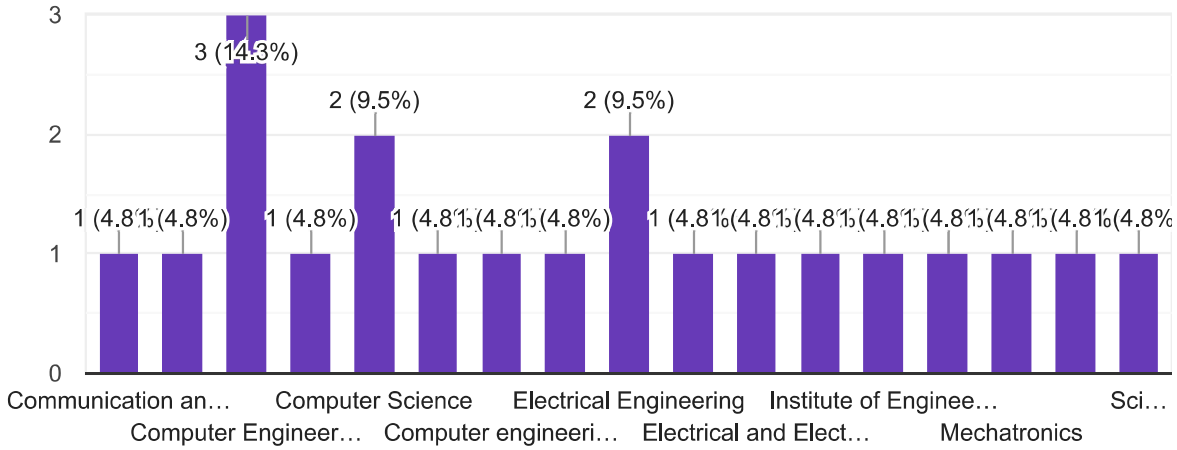
Institution

21 responses



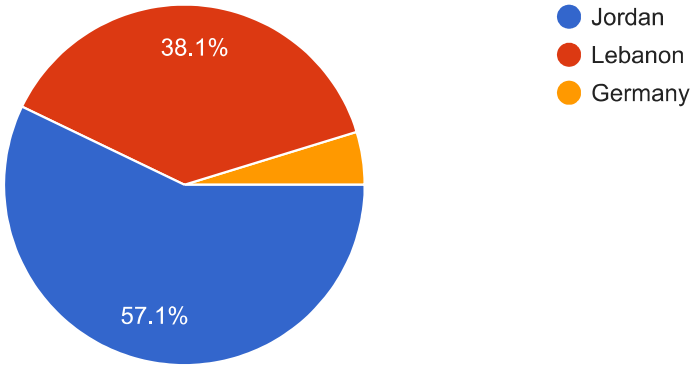
Department

21 responses



Country

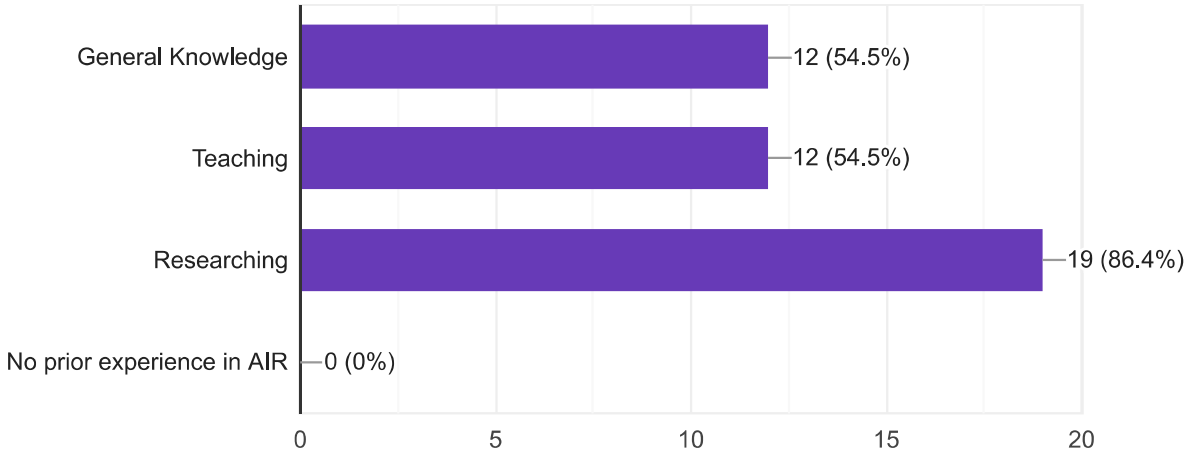
21 responses



Untitled Section

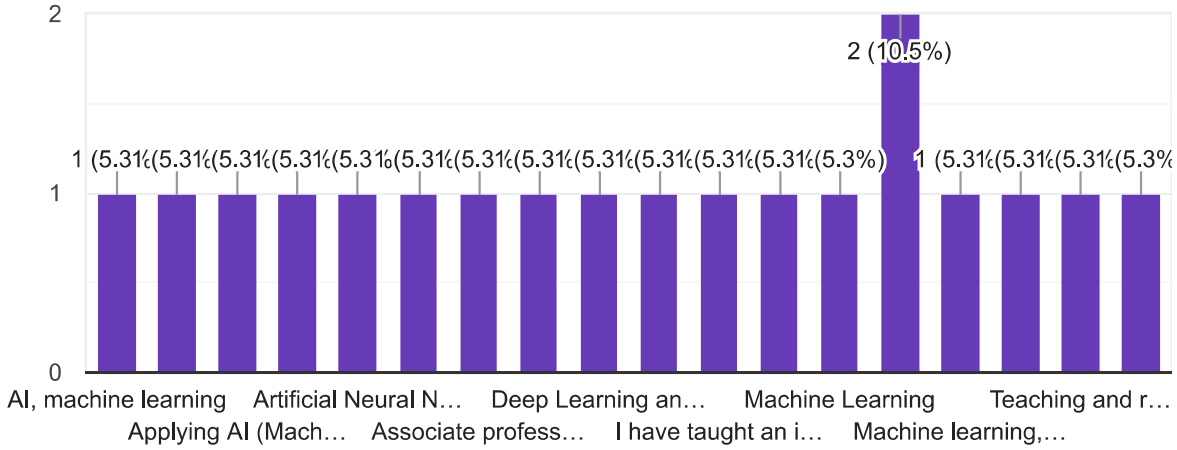
What is your experience in AI and Robotics?

22 responses



If you have prior experience in AI and Robotics, then please specify your experience domain.

19 responses



Does your curriculum contain courses on AI and Robotics? If yes, please list the names of these courses.

20 responses

Yes

Yes. AI, NN, Fuzzy Logic, and Programming for AI

Introduction to Robotics, AI

Machine Learning
Data Mining
Non Linear control applied to Robotics

Robotics, Machine Learning

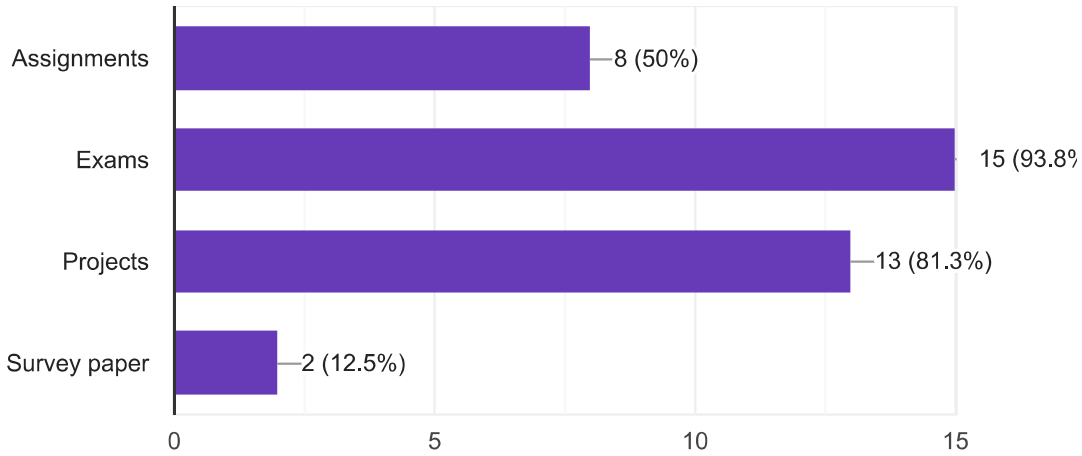
Introduction to AI, Machine Learning, Deep Learning, Natural Language Processing, Neural Network, Fuzzy Logic, Robotics, Games

yes AI for industrial control

Machine learning and AI, advanced machine learning, data science, machine vision,

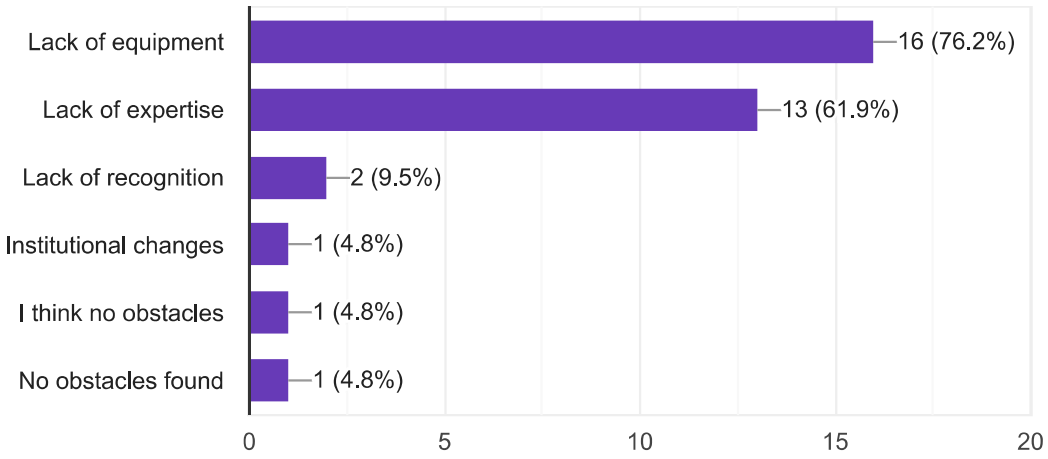
If you taught AIR courses before, then what tools did you use for assessment?

16 responses



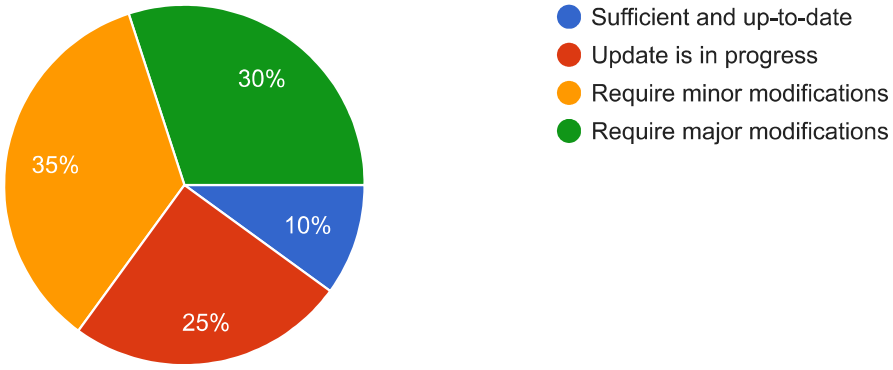
In your opinion, what are the obstacles of teaching AIR courses in your institution?

21 responses



What is the status of AI and Robotics courses in your curriculum?

20 responses



In your opinion, what courses and labs should be included in the curricula of AI and Robotics related programs?

15 responses

Machine learning & Data science

Robotics lab , machine learning lab

Advanced AI and Robotics design

Robotic Lab
Deep Learning Lab
ROS based development environment Lab

We need to introduce lab sessions that include the latest frameworks in ML

Practical Labs that use the latest kits for AI and labs that should include some robots and manipulators.

Signal porcessing, image processing, Deep Learning Lab

Modeling and Simulation in Mechatronics, Concepts of Automatic Control, Deep

In your opinion, what equipment should be available to support AI and Robotics related programs?

17 responses

Specialized SW & HW equipment

labs with powerful PCs

Drones , different types of robots,

Deep Learning Tools
GPU
Robots, Mission Planners, autonomous robots simulation tools

High-performance computers for AI

Kits from NVIDIA and mini Robots

GPU accelerated workstations

Robotics lab, computers with GPU lab,

If you are offered to get training courses in AI and Robotics, what topics would be of greatest importance and interest to you?

18 responses

Machine learning & Deep learning

Image segmentation techniques. Big data analysis

All

Deep Learning tools
Serial and parallel manipulators
ROS development environment
autonomous robots path planning

Applications of ML techniques in communication systems

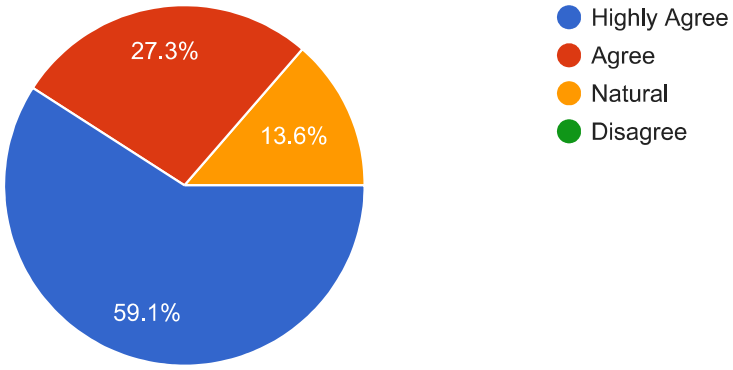
DNN, High computing hardware for AI

Time series prediction, Deep Learning using Pytorch, Model deployment

Machine learning in security, machine learning using Python, data science, natural

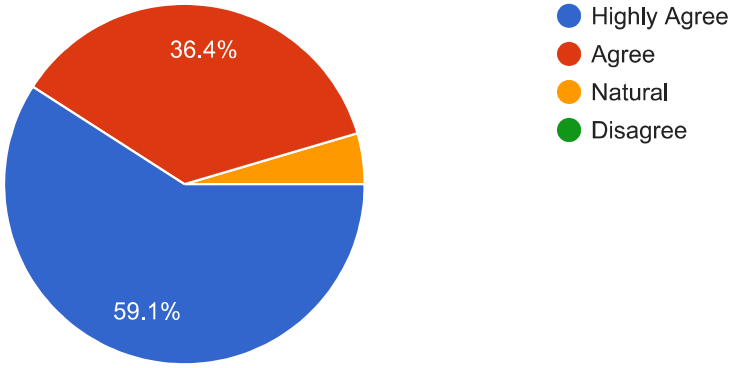
Do you agree that qualifying students in AI and Robotics will increase their employability?

22 responses



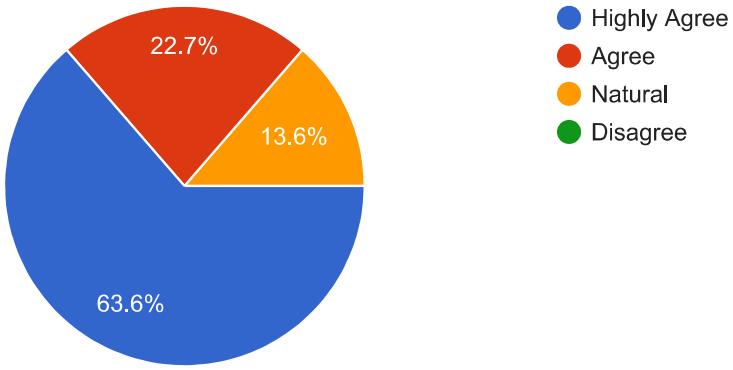
Do you agree that enhancing AI and Robotics skills of students and faculty members and supporting them with specialized equipment/labs will result in practical research and projects which solve real life problems?

22 responses



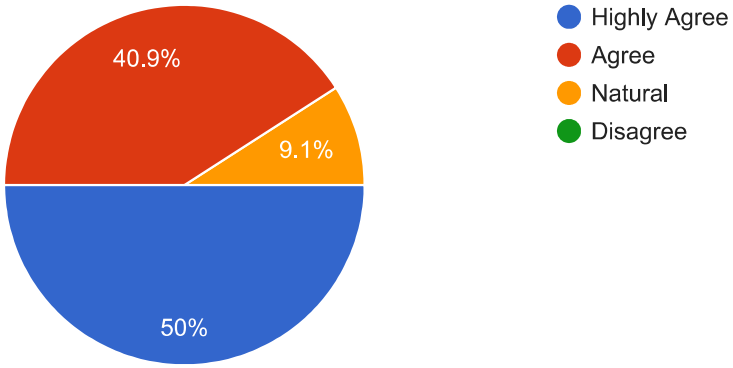
Do you agree that qualifying faculty members in AI and Robotics will open the door to collaborate with the industry to solve their problems?

22 responses



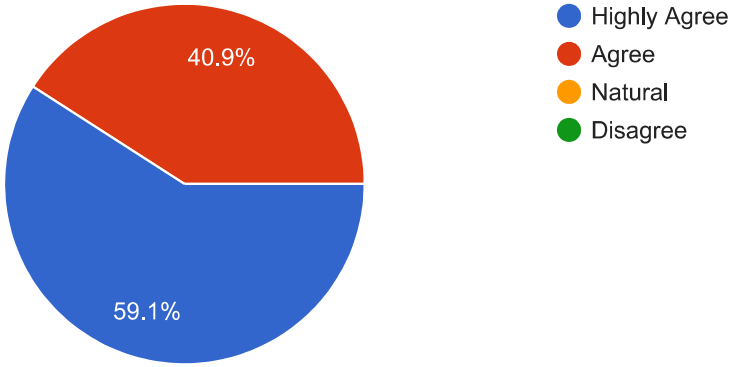
Do you agree that qualifying faculty members in AI and Robotics may help them in securing research funds from different national and international funding agencies?

22 responses



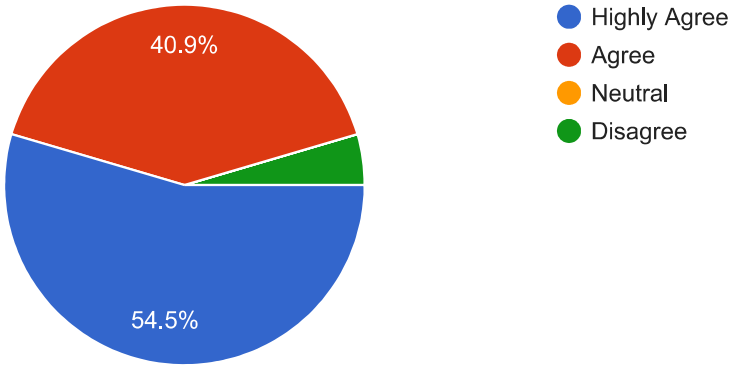
Do you agree that qualifying faculty members in AI and Robotics may create opportunities for interdisciplinary research projects (i.e. apply AI and Robotics in the field of medicine, agriculture, pharmacy etc..)

22 responses



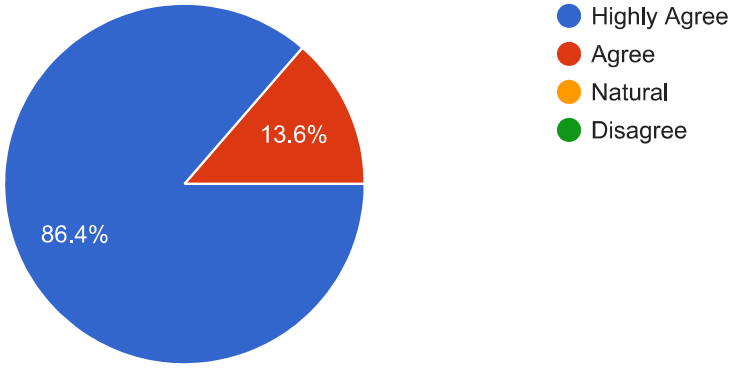
Do you agree that the universities in your country should open specialized programs in AI and Robotics?

22 responses



Do you agree that the collaboration with the European universities specialized in AI and Robotics would help in improving the quality of the AI and Robotics programs in terms of teaching and preparing high quality graduates?

22 responses



Other comments

2 responses

The program we have at TTU is AI only. Robotics are not included in any other programs. I suggest to add Robotics either to the curriculum of AI or Mechatronics program.

A master program in Jordan may not be of interest to Jordanians at the current time .. may be in the next (10) years especially that governmental policies and regulations will take some time to be polished and modified for the industrial sector.