

Virtual and Augmented Reality
(V&AR) in Design for Manufacture

Strategic Partnership Project

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Tehcnical Drawings Training Needs Assessment Results

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Purpose

- To establish a training and needs baseline
- To evaluate training and professional development needs
- To identify any additional needs to improve work and skills performance
- To work with partner organizations in developing a training needs action plan

Goals of the IO1 and IO2

Need Analysis

- Workshops
- Questionnaires
- Benchmarking



Virtual
Design for
Manufacture
Trainings



Outcomes

- Increase in technical skills
- Decrease in defection
- Decrease in the training time
- Increase in the training performance
- Increase in the development perception

Stakeholder Analyses

Methodology

- Literature review
- Interview with Industry and NGO staff
- Workshop with lecturer and teachers

Stakeholders	How	Why	
Students	Customers	Base Beneficiary	1
Lecturers	Internal	Teaching and developing	2
Teachers	Internal	Teaching	3
Universities	External	Teaching and developing	4
Vocational High Schools	External	Teaching	5
Sector managers	External	Strategic stakeholder	6
Sector Employees	External	Beneficery	7
Governmental staff	External	Base stakeholder	8
NGOs	External	Beneficery and Strategic s.holder	9

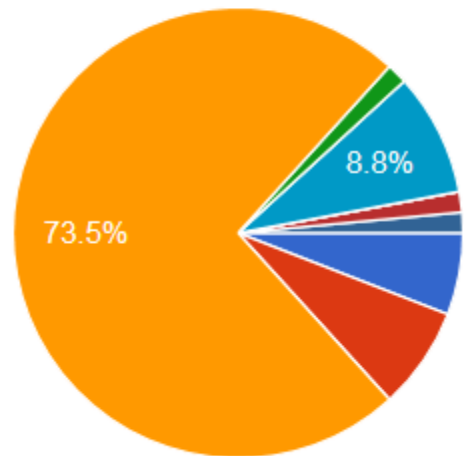
Need Analyses Methodology

1. Data Collection through Technical Drawings Training Needs via google Survey
 2. Focus Groups and Key Interviews
 3. Student affairs documents (exam results etc.)
- Total person surveyed; 320 (252 from Turkey, 58 from Bulgaria and 10 from UK)
 - 9600 surveys delivered with 320 respondents
 - Analysis of data using Gap Analyses method

Type of Respondents from UK and BG

Personal

68 responses



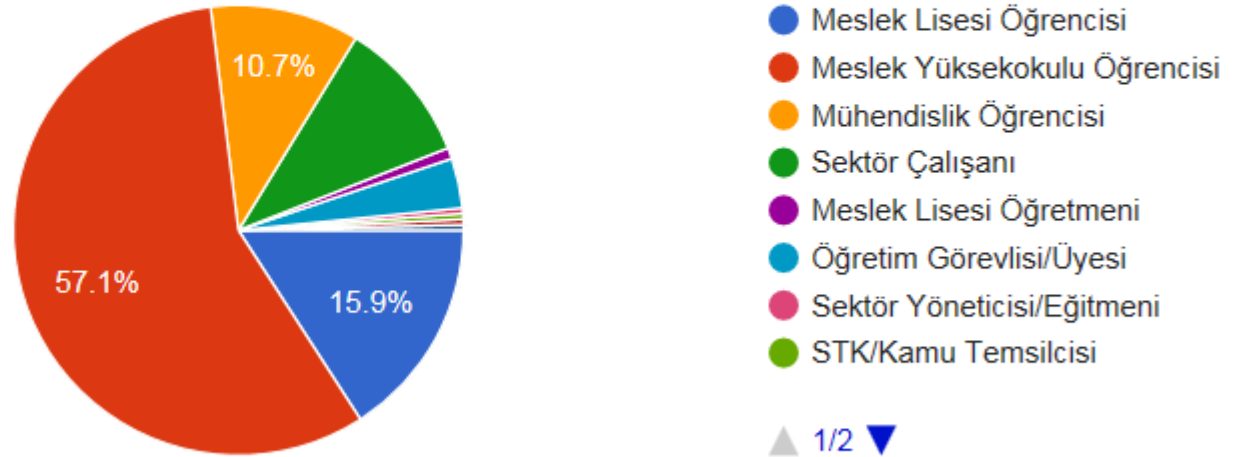
- Vocational High School Student
- Vocational College Student
- Engineering / Design Student
- Sector Employee
- Vocational High School Teacher
- Instructor/Lecturer
- Sector Manager/Trainer
- NGOs / Public Representative

▲ 1/2 ▼

Type of Respondents from TR

Değerlendirme yapan

252 responses



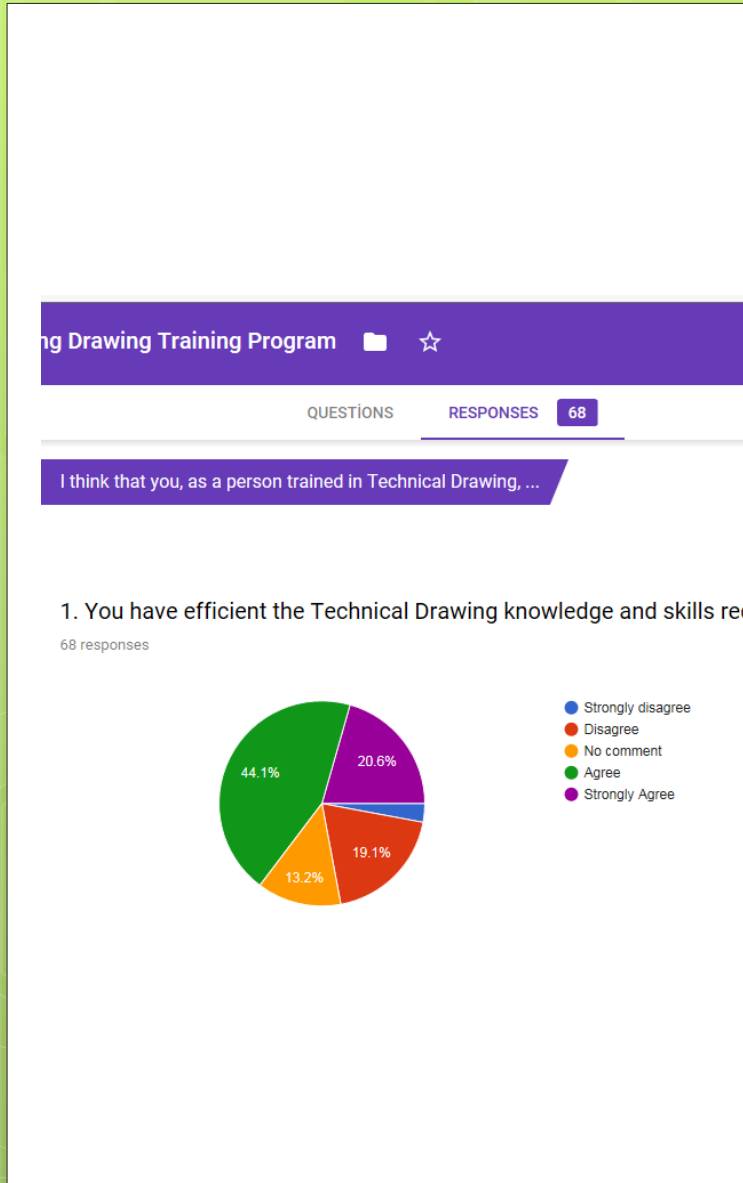
Evaluation of surveys

The assessment survey covers 30 questions at three different categories

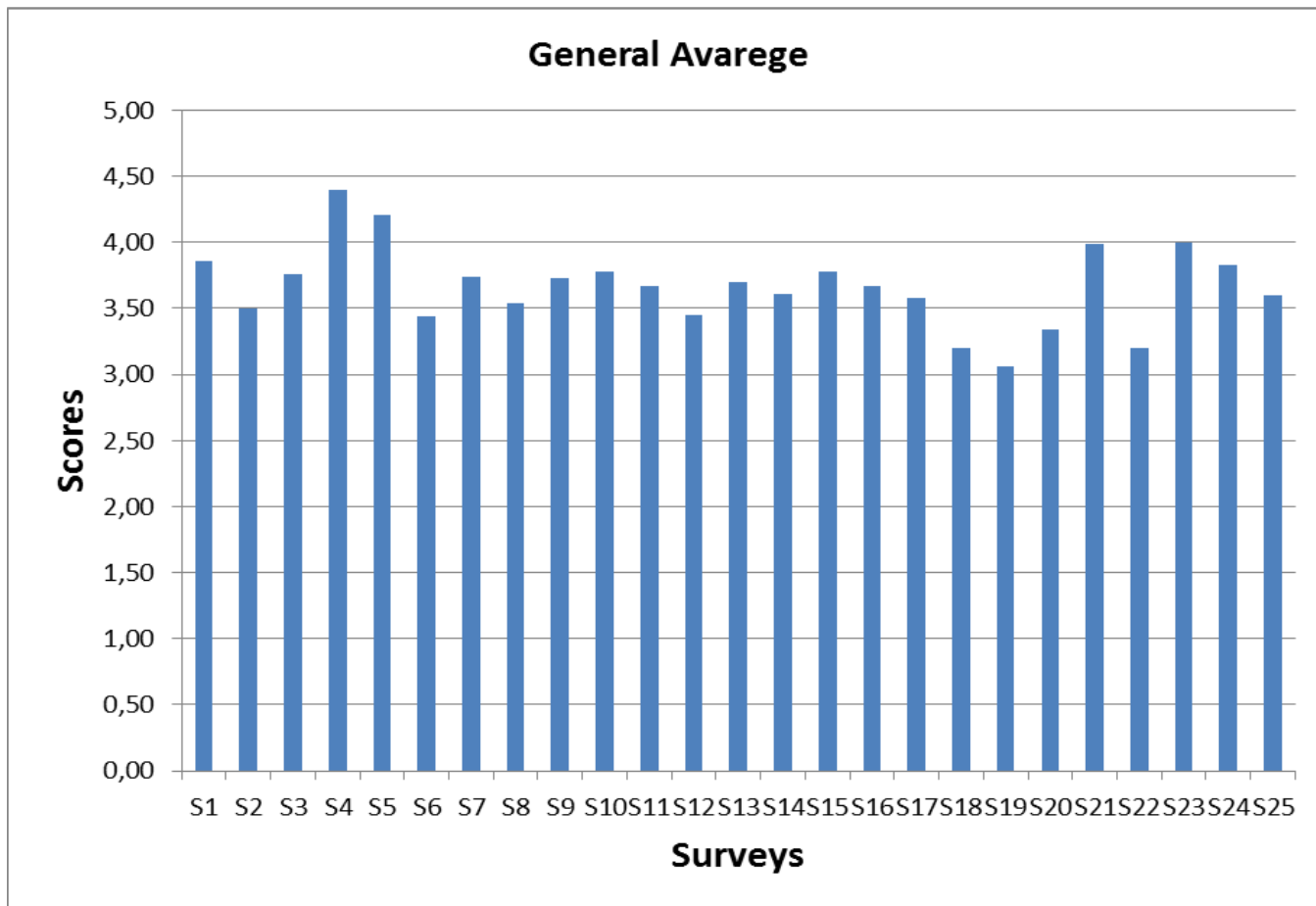
First category is to measure about Perception of Technical Drawing Education

Second category is to measure about Technical Drawing Knowledge and Ability

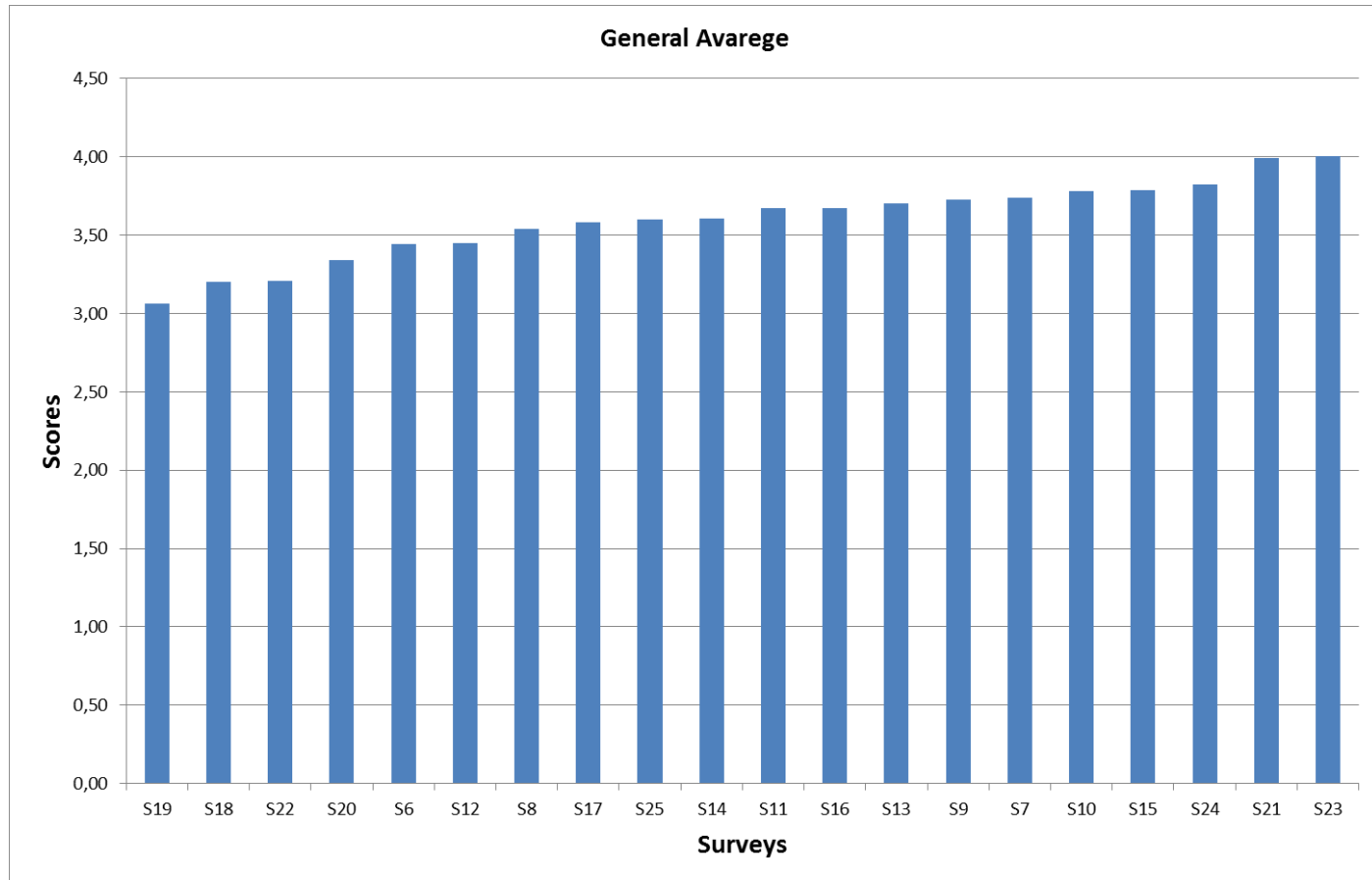
Third category is to measure about Expectations about Technical Drawing Education



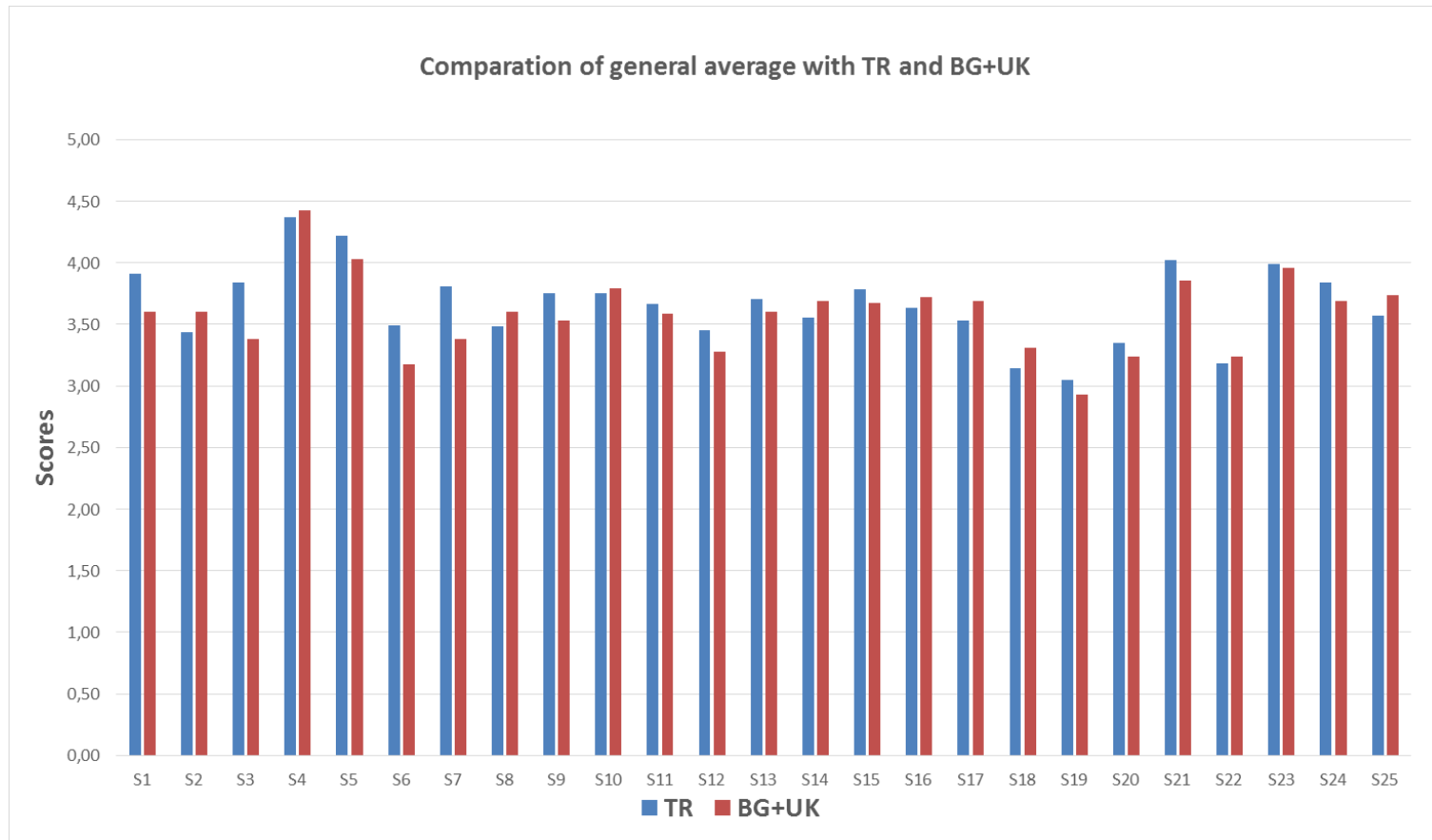
Key Preliminary Findings



Key Preliminary Findings



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Key Preliminary Findings

According to the needs analysis, the required technical topics

1	19. You know the difference between circular runout and total runout.
2	18. You know the details of true position tolerance and maximum material application.
3	20. You know the Surface roughness concept, signs and Ra, Rz, Rmax. standards of the symbols.
4	12. You know the critical details of the absolute and auxiliary measure.
5	8. You know the projection methods and you can read these methods from the symbols on the title blocks.
6	17. Recognize geometric dimensioning and tolerancing symbols and know the meanings on the drawing.
7	14. You can read the corner chamfer tolerances.
8	11. You can read dimension tolerances in manufacturing drawings
9	16. You know the difference and importance of geometric dimensioning and tolerancing in manufacturing.
10	13. You can read the symbols for shaft and hole tolerances and find the fitting tolerances on the tables.
11	9. You know the types of sectioning and you can distinguish between full and stepped sectioning.
12	7. You know the details on the drawing title block and read the general tolerances on the title block
13	10. You know perspective methods and visualize perspective drawings in your head..
14	15. You can easily distinguish manufacturing and assembly drawings.

Key Preliminary Findings

Subject headings after material requirement analysis for material development

1	Geometric Dimensioning and Tolerancing
2	Surface roughness
3	Measurement
4	Projection methods
5	Corner chamfer tolerances
6	Dimension tolerances
7	Shaft and hole tolerances
8	Sectioning
9	Perspective
10	Manufacturing and assembly drawings

Key Preliminary Findings

No	Question	TR	BG+UK	Total		Response	%
26	How many hours a week training you had during your education	98	6	104	4 hours	186	0,56
		35	30	65	2 -3 hours	186	0,35
27	Have you had further training during your employment, if you do duration and subject?	147	38	185	Nothing	230	0,80
		16	5	21	Tolerances/CAD	230	0,09
28	Have you used VR or AR for game or training, if yes; do you think mobile phone, mobile devices will play an important role in education people	96	33	129	No	236	0,55
		59	15	74	Yes	236	0,31
29	When you need further information on technical drawing, what do you do first? e.g. search on google, check book, teacher or lecturer	109	27	138	Google	288	0,48
		40	7	47	Books	288	0,16
		75	12	87	Teacher	288	0,30
		2	2	4	Internet	288	0,01
30	What is the last book or standard (training you had) you read about technical drawings?	55	16	71	Nothing read	190	0,37
		29	11	40	Course book	190	0,21
		30	7	37	Standards	190	0,19
		8	9	17	Autocad	190	0,09

Conclusion

This study, in which very different analyzes can be made and which constitutes an important data base in terms of both the number of participants, the participant diversity and also the country diversity, has been possible in many sub-analyzes not given in the above findings.

A detailed analysis of the 5 units at 5 li likert scale, the comparison of differentiation on schools and occupational groups, the comparison between countries, and so on. workshops were archived for use in the content and material development phases of the project.

The obvious truth that has emerged is that there is an important deficit in all stakeholder groups and countries that can not be covered by known methods, which must be closed in the field of Technical Drawing Education.



Thank you.....