



# MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

## Department of Computer Science and Engineering

### CSE-402: SYSTEM ANALYSIS DESIGN AND DEVELOPMENT SESSIONAL

#### INFORMATION GATHERING REPORT

Section: A

Group No: 02

Session: 2017-2018

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**CSE-402**

**SYSTEM ANALYSIS, DESIGN AND DEVELOPMENT SESSIONAL**

**(GROUP-2, SEC-A)**

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**Name of the Project:** AR in Education

**Method of information gathering**

- a. Questionnaires
- b. Literature review
- c. Interview

**Sources of Information**

- a. Students
- b. Parents
- c. Online articles & research papers
- d. Administration personnel
- e. School Teacher

**Information needed**

- a. How efficient is our current education system?
- b. Coping mechanism for the difficulties while studying.
- c. How the performance of the existing system can be enhanced?
- d. How the teachers are teaching critical topics at present?
- e. Current privileges to have access to technology.
- f. How familiar the Augmented Reality method is?
- g. What kind of devices is preferable for Augmented Reality?
- h. How does AR help in education?

## **Information Gathering** **Information Gathered through Questionnaires(Method-a)**

### **Source of information: Students**

Ser.	Information needed	Questions	Answers
1.	How efficient is our current education System?	Are you satisfied with the learning process of traditional education system?	Dissatisfied (by the most users)
		Which medium do you like to learn from?	Via video or image (by most users)
2.	Coping mechanism for the difficulties while studying	Which one do you prefer when you don't understand a topic while studying at home?	Browse the internet for better understanding
		What do you do when you don't know how to pronounce a word?	Look up the word in Google Translate
3.	Current privileges to have access to technology	Do you have access to any electronic smart devices?	Yes (by the most users)
		Is internet connection attainable in your area?	Yes (Wi-Fi / Broadband)
4.	How familiar the Augmented Reality method is?	How familiar are you with the concept regarding Augmented Reality?	Not so familiar
5.	How the performance of the existing system can be enhanced?	If you want to bring some changes in the traditional education system, which of the followings do you prefer?	Wants smart classroom (provide necessary YouTube links, Wikipedia references)
6.	What kind of devices is preferable for Augmented Reality?	What kind of device will be suitable if you want to have a 3D visual experience?	Handheld displays (Smartphones, Tablet)
<b>Outcomes:</b> <ol style="list-style-type: none"> <li>1. Most students are dissatisfied with current education system.</li> <li>2. Students browse Internet to solve their confusion while studying at home.</li> <li>3. Most of the students have access to smart devices and internet connection.</li> <li>4. Augmented Reality is not really popular among the students.</li> <li>5. Students want internet based education system in classroom for better understanding.</li> <li>6. Most students are comfortable using handheld devices.</li> </ol>			

### **Information Gathered through Questionnaires (Method-a)**

#### **Source of information: Parents**

Ser.	Information needed	Questions	Answers
1.	How familiar the Augmented Reality method is?	How familiar are you with the concept regarding Augmented Reality?	Not at all familiar (by most of the users)
2.	Coping mechanism for the difficulties while studying	What do you do when your child faces problem while studying?	Arrange for private tuition or suggest to take help from internet
3.	Current privileges to have access to technology	Do you have smartphones at your home (accessible to your child)?	Yes (by all of the users)
		Can you afford 3D supported devices?	If necessary, can try to afford
		How long are you comfortable to allow your child to be on internet other than school activities?	5-6 hours (by most of the users)
Outcomes: 1. Most of the parents are not familiar with Augmented Reality concept. 2. Parents usually arrange for private tuition or suggest browsing the internet. 3. Parents try to afford 3D devices for their child's education upon requirement and give them access to internet for study purpose.			

### **Information Gathered through Literature Review(Method-b)**

**Source of information:** Online articles & research papers

a.

<b>Information needed:</b>	How does AR help in education?
<b>Source:</b>	Reference [1],[2],[3]
<b>Outcome:</b>	Animation together with interesting data and an engaging presenter helps the audience understand the results of an analysis of information.

b.

<b>Information needed:</b>	How the performance of the existing system can be enhanced?
<b>Source:</b>	Reference [1],[2],[3]
<b>Outcome:</b>	The advantages and beneficial uses of AR features are able to engage students in learning processes and help improve their visualization skills.

c.

<b>Information needed:</b>	What kind of devices is preferable for Augmented Reality?
<b>Source:</b>	Reference [1],[2],[4]
<b>Outcome:</b>	See-through and Monitor-based displays are two major types of displays used in augmented reality.

## **Information Gathered through Interview(Method-c)**

### **Source of information: Administration Personnel**

We have interviewed some key personnel of Ministry of Education through structured and unstructured way. The key points found from the whole interview process have been highlighted below:

Ser.	Information needed	Questions	Answers
1.	How efficient is our current education system?	What do you think about the differences of our education system with the developed countries around the world?	Actually, our current education system actually cannot be compared with the developed countries as it is very difficult to ensure different facilities (i.e., internet facilities, the basic necessities for education, etc.) for each and every student in our country. Despite those facts, our country is actually trying a lot to keep up pace with the modern education system.
2.	How the performance of the existing system can be enhanced?	What measures can be taken to make our education system more dynamic?	Introducing new technologies can make our teaching system more practical. But in this case, the technologies should be installed as a classroom or institutional feature so that the students do not have to afford individually.
		What are the measures education ministry has already taken to digitalize our education system?	Education Ministry has undertaken many projects like “Sheikh Rasel Digital Lab” to ensure the supply of multimedia tech (computer, projector etc). Government have also taken initiatives to ensure internet connection available in 18 schools of each sub-district in Bangladesh.  Training program is also being offered to develop ICT skills of teachers.
<b>Outcome(s):</b>  1. While introducing new technology in our education system, the economic condition of a group of people should be taken in consideration which is not important in developed countries.  2. To make our teaching system more practical, the technologies should be installed as a classroom or institutional feature so that the students do not have to afford individually.			



### **Information Gathered through Interview(Method-c)**

#### **Source of information: School Teacher**

We have interviewed a school teacher through structured and unstructured way. The key points found from the whole interview process have been highlighted below:

<b>Ser.</b>	<b>Information needed</b>	<b>Questions</b>	<b>Answers</b>
1.	How efficient is our current education system?	What do you think about the differences of our education system with the developed countries around the world?	Our education system is not mostly experiment based compared to them. That's why students sometimes cannot visualize different topics of various subjects.
2.	How the teachers are teaching critical topics at present?	What do you do to make the students understand critical topics?	We always try to give them our daily life examples related to the topics.
3.	How the performance of the existing system can be enhanced?	What measures can be taken to make our education system more practical?	If some of the apparatus can be made out of the raw materials which are available in our country, it will help a lot or if a system can be made by which the students can get to visualize different things will work out too.

#### **Outcome(s):**

1. The main difference is our education system is not mostly experiment based compared to the education system of developed countries.
2. Due to the lack of experimental apparatus, the teachers try to explain different topics students using daily life examples.
3. To make our education more practical some apparatus should be made using materials available in our country or a system should be made which can be used to have various real time experiences.

## **Outcome summaries**

1. Most students are dissatisfied with current education system.
2. Most of the families have access to smart devices and internet connection.
3. Students browse Internet to solve their confusion while studying at home.
4. Augmented Reality is not really popular among the students and parents.
5. Students want internet based education system in classroom for better understanding.
6. Most of the students are comfortable using handheld devices.
7. Parents usually arrange for private tuition or suggest browsing the internet.
8. Parents try to afford 3D devices for their child's education upon requirement and give them access to internet for study purpose.
9. Animation together with interesting data and an engaging presenter help the audience understand the results of an analysis of information.
10. The advantages and beneficial uses of AR features are able to engage students in learning processes and help improve their visualization skills.
11. See-through and Monitor-based displays are two major types of displays used in augmented reality.
12. While introducing new technology in our education system, the economic condition of a group of people should be taken in consideration.
13. To make our teaching system more practical, the technologies should be installed as a classroom or institutional feature so that the students do not have to afford individually.
14. The main difference is our education system is not mostly experiment based compared to the education system of developed countries.
15. Due to the lack of experimental apparatus, the teachers try to explain different topics students using daily life examples.
16. To make our education more practical some apparatus should be made using materials available in our country or a system should be made which can be used to have various real time experiences.

## **Existing system:**

### **Traditional Education System in Our Country:**

1. Traditional chalk and talk teaching method and the use of static textbooks are failing to engage students and leading to poor learning outcomes.
2. The study of Science is a complex process that includes identifying a problem, investigating the problem, making hypotheses, planning the data collection method, testing the hypotheses, collecting the data and making the conclusion and results. Our traditional education system often seems hard and boring due to the lack of proper representation of the actual concept.
3. Students are less interested in studying Science because of their perception that it is a boring subject involving too many abstract concepts.

### **Augmented Reality (AR) Based Education System:**

1. One of the technologies that show great potential in education especially in visualizing abstract concepts is Augmented Reality (AR). AR is a technology that brings the computer world to the human world.
2. AR displays objects and concepts in different ways and at different viewing angles which helps the students to better understand the subjects. But it is not so common or widely used system in our country.
3. Many participants in an AR learning exercise agreed that the AR tools are good but most participants did not consider the tools to be as effective as reading textbooks. They found that using AR tools to obtain information was not easy.
4. AR tool itself is easy to operate, the procedure of sending the image, recognizing the text and then getting the meaning of the text is time-consuming. This is because the technology used the 3G network to connect to the Internet. Accordingly, the participants may need to wait a short time for the information to be sent back from the server.
5. The identification of this limitation is supported by the results of a study where the participants reported being frustrated when using the technology outdoors and had to resort to asking their teacher for help.

Despite all the difficulties, the level of engagement in the outdoor AR activities is still very high but, in our country, AR based education system is not common in most cases.

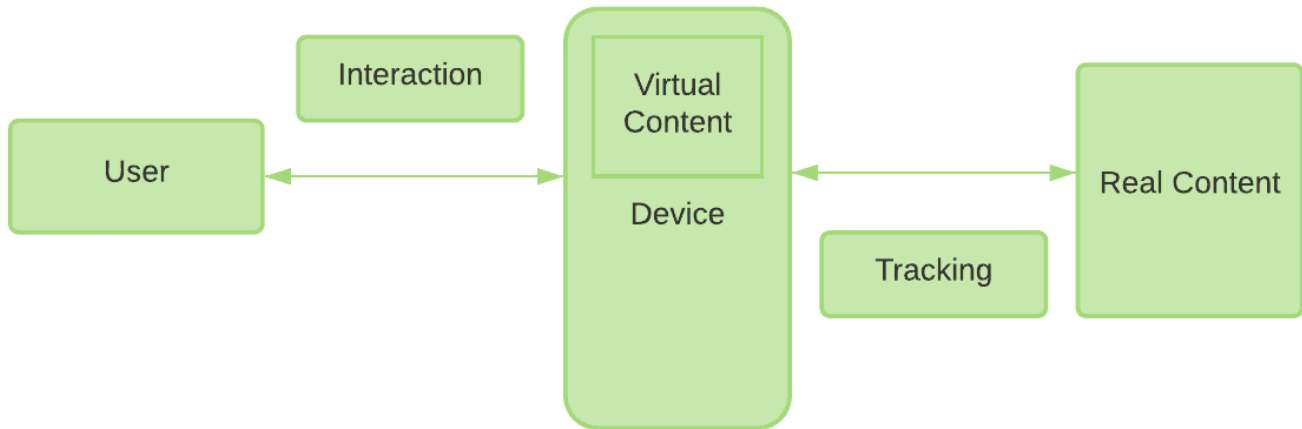


Figure-1: Working diagram of Existing System

## **Appendices:**

### **Appendix A (References)**

[1] Nor Farhah Saidin, Noor Dayana Abd halim and Noraffandy Yahaya. "A Review of Research on Augmented Reality in Education: Advantages and Applications". Researchgate, Available: [https://www.researchgate.net/publication/281336331\\_A\\_Review\\_of\\_Research\\_on\\_Augmented\\_Reality\\_in\\_Education\\_Advantages\\_and\\_Applications](https://www.researchgate.net/publication/281336331_A_Review_of_Research_on_Augmented_Reality_in_Education_Advantages_and_Applications). (accessed: Apr 15, 2021).

[2] Pallikonda Subhashini, Raqshanda Siddiqua, Keerthana Aitha and Pamu Pavani. "Augmented Reality in Education". Researchgate, Available: [https://www.researchgate.net/publication/348113047\\_Augmented\\_Reality\\_in\\_Education?\\_sg=2io8bJU499fFuo7rHyG8VNsIlgPjWrqtfy3pYjyoI2oGC2BXOObEPfJeATyl5UDrgr5uTP8VaDez-0](https://www.researchgate.net/publication/348113047_Augmented_Reality_in_Education?_sg=2io8bJU499fFuo7rHyG8VNsIlgPjWrqtfy3pYjyoI2oGC2BXOObEPfJeATyl5UDrgr5uTP8VaDez-0). (accessed: Apr 15, 2021).

[3] Iuliana Andreea Sicaru, Ciprian Gabriel Ciocianu and Costin-Anton Boiangiu. "A SURVEY ON AUGMENTED REALITY". Researchgate, Available: [https://www.researchgate.net/publication/333969219\\_A\\_SURVEY\\_ON\\_AUGMENTED\\_REALITY](https://www.researchgate.net/publication/333969219_A_SURVEY_ON_AUGMENTED_REALITY) (accessed: Apr 15, 2021).

[4] Mehmet Kesim and Yasin Ozarslan. "Augmented Reality in Education: Current Technologies and the Potential for Education". Researchgate, Available: [https://www.researchgate.net/publication/257716287\\_Augmented\\_Reality\\_in\\_Education\\_Current\\_Technologies\\_and\\_the\\_Potential\\_for\\_Education](https://www.researchgate.net/publication/257716287_Augmented_Reality_in_Education_Current_Technologies_and_the_Potential_for_Education) (accessed: Apr 15, 2021).

### **Appendix B (Information Gathering Matrix)**

Ser.	Information Needed	Source	Method	Outcome
1	How efficient is our current education system compared? (I1)	Students(S1)	Questionnaire(M1)	Most students are dissatisfied with current education system.(O1)
		Administration Personnel(S4)	Interview(M3)	While introducing new technology in our education system, the economic condition of a group of people should be taken in consideration which is not important in developed countries. (O2)
		School Teacher(S5)		The main difference is our education system is not mostly experiment based compared to the education system of developed countries. (O3)
2	Coping mechanism for the difficulties while studying.(I2)	Students(S1)	Questionnaire(M1)	Students browse Internet to solve their confusion while studying at home.(O4)
		Parents(S2)		Parents usually arrange for private tuition or suggest browsing the internet.(O5)
3	How the performance of the existing system can be enhanced?.(I3)	Students(S1)	Questionnaire(M3)	Students want internet based education system in classroom for better understanding.(O6)
		Online articles & research papers(S3)	Literature review(M2)	The advantages and beneficial uses of AR features are able to engage students in learning processes and help improve their visualization skills.(O7)

		Administration Personnel(S4)	Interview(M3)	To make our teaching system more practical, the technologies should be installed as a classroom or institutional feature so that the students do not have to afford individually.(O8)
		School Teacher(S5)		To make our education more practical some apparatus should be made using materials available in our country or a system should be made which can be used to have various real time experiences.(O9)
4	Current privileges to have access to technology.(I4)	Students(S1)	Questionnaire(M1)	Most of the students have access to smart devices and internet connection.(O10)
		Parents(S2)		Parents try to afford 3D devices for their child's education upon requirement and give them access to internet for study purpose.(O11)
5	How the teachers are teaching critical topics at present?(I5)	School Teacher(S5)	Interview(M3)	Due to the lack of experimental apparatus, the teachers try to explain different topics students using daily life examples.(O12)
6	How familiar the Augmented Reality method is?(I6)	Students(S1)	Questionnaire(M1)	Augmented Reality is not really popular among the students and parents.(O13)
		Parents(S2)		
7	What kind of devices is preferable for Augmented	Students(S1)	Questionnaire(M1)	Most students are comfortable using handheld devices.(O14)

	Reality?(I7)	Online articles & research papers(S3)	Literature review(M2)	See-through and Monitor-based displays are two major types of displays used in augmented reality.(O15)
8	How does AR help in education?(I8)	Online articles & research papers(S3)	Literature review(M2)	Animation together with interesting data and an engaging presenter helps the audience understand the results of an analysis of information.(O16)

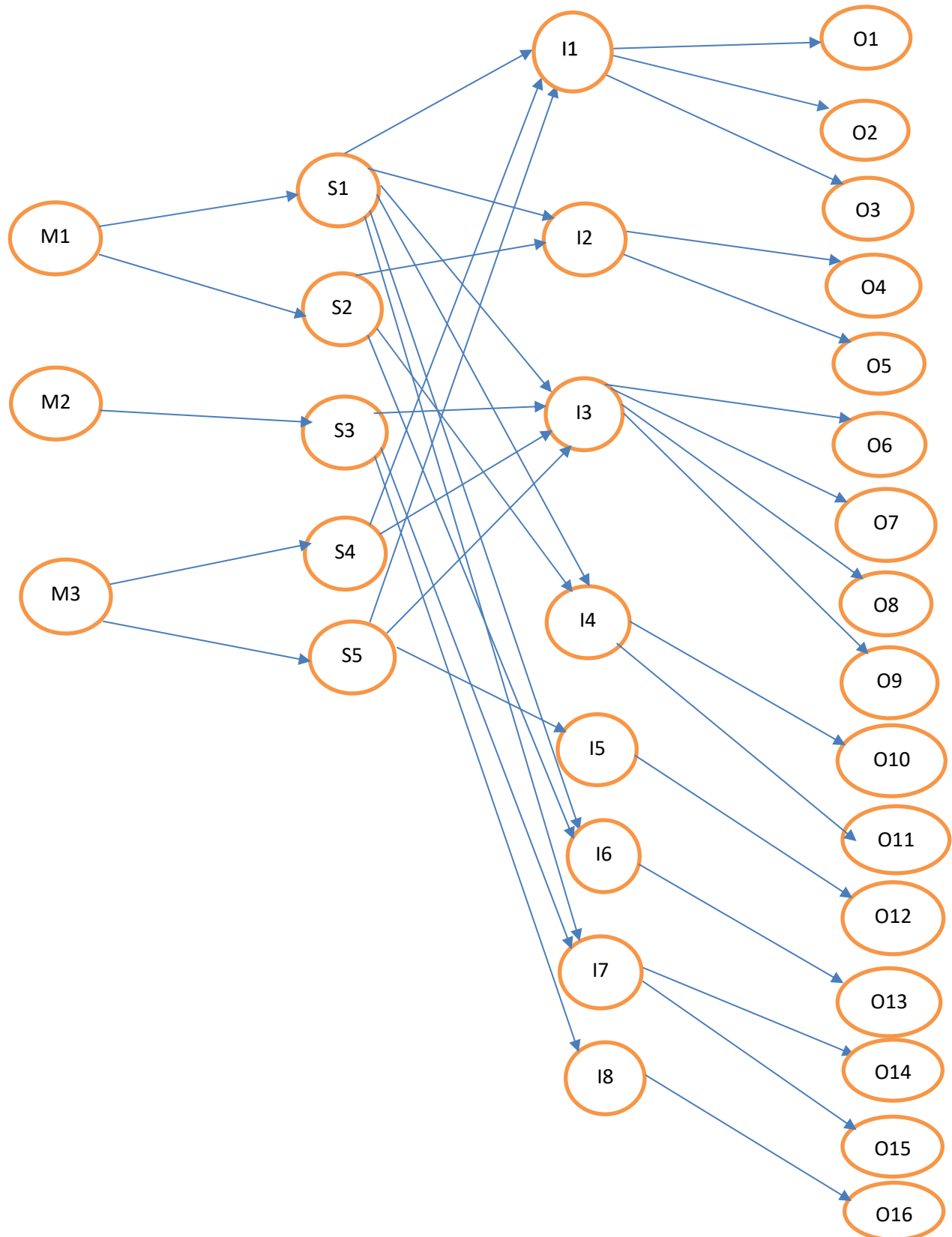


Method

Source

Information

Outcome



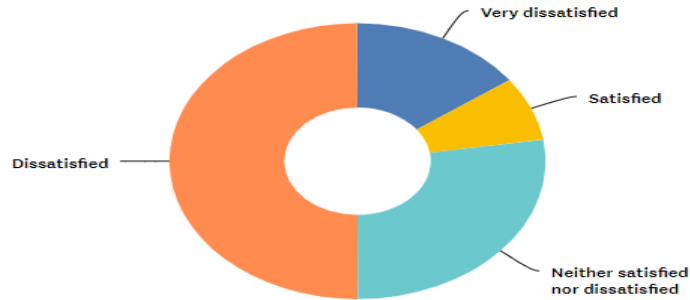
## Appendix C (Questionnaires)

### Questionnaires for Students:

Some questions for students and their respective responses are attached below:

Are you satisfied with the learning process of traditional education system?

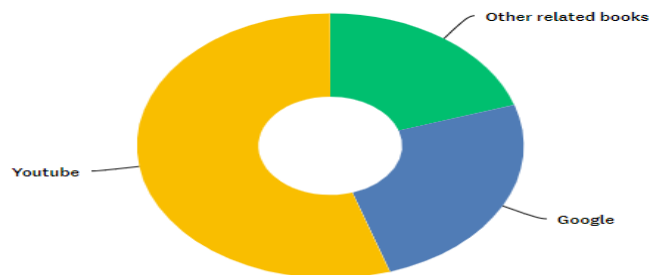
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very satisfied	0.00%	0
Very dissatisfied	15.00%	6
Satisfied	7.50%	3
Neither satisfied nor dissatisfied	27.50%	11
Dissatisfied	50.00%	20
TOTAL		40

Which one do you prefer when you don't understand a topic while studying?

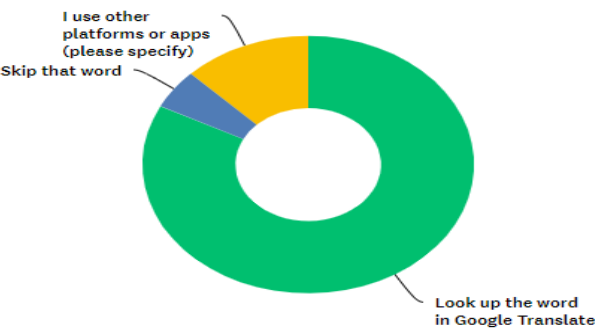
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Other related books	20.00%	8
Google	25.00%	10
Youtube	55.00%	22
TOTAL		40

What do you do when you don't know how to pronounce a word?

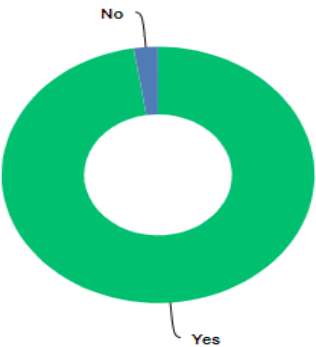
Answered: 40    Skipped: 0



ANSWER CHOICES	RESPONSES	
Look up the word in Google Translate	82.50%	33
Skip that word	5.00%	2
I use other platforms or apps (please specify)	12.50%	5
TOTAL		40

Do you have access to any electronic smart devices?

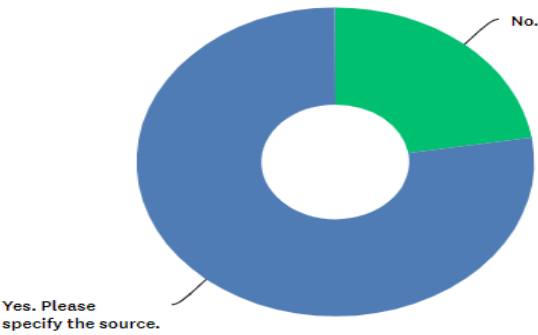
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ANSWER CHOICES	RESPONSES	
Yes	97.50%	39
No	2.50%	1
TOTAL		40

Is internet connection attainable in your area?

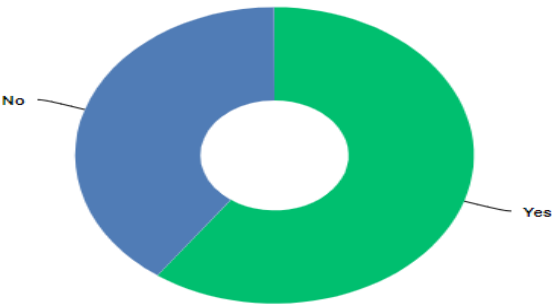
Answered: 40    Skipped: 0



ANSWER CHOICES	RESPONSES
No.	22.50%9
Yes. Please specify the source.	77.50%31

Are you comfortable with carrying extra device to your institution?

Answered: 40    Skipped: 0

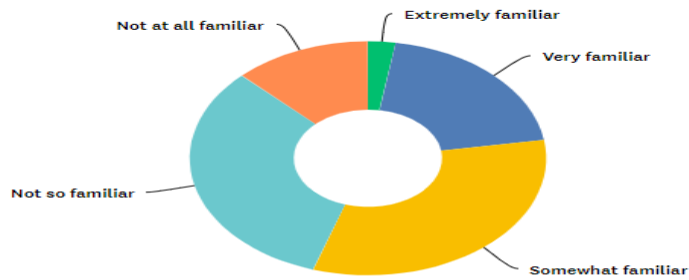


ANSWER CHOICES	RESPONSES
Yes	60.00%24
No	40.00%16
TOTAL	40

## AR in Education

### How familiar are you with the concept regarding Augmented Reality?

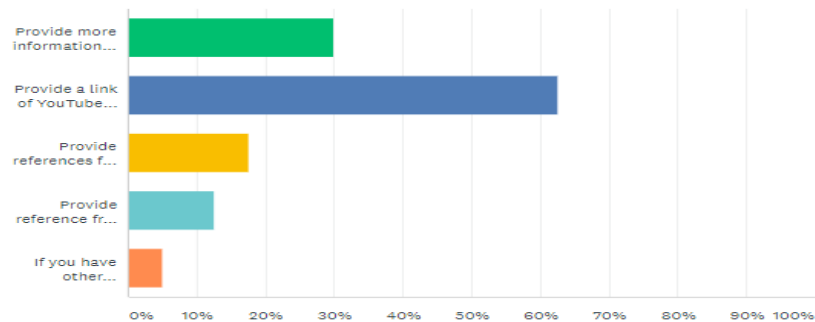
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Extremely familiar	2.50%	1
Very familiar	20.00%	8
Somewhat familiar	32.50%	13
Not so familiar	32.50%	13
Not at all familiar	12.50%	5
TOTAL		40

### If you want to bring some changes in the traditional education system, which of the followings do you prefer?

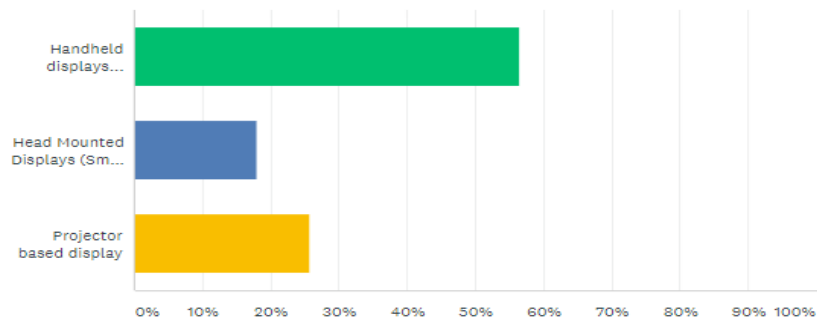
Answered: 40 Skipped: 0



ANSWER CHOICES	RESPONSES	
Provide more information with a Wikipedia link, if possible	30.00%	12
Provide a link of YouTube Video	62.50%	25
Provide references from other books	17.50%	7
Provide reference from social media, if possible	12.50%	5
If you have other suggestions, please specify.	Responses 5.00%	2
Total Respondents: 40		

Which of the following device will be suitable if you want to have a 3D visual experience?

Answered: 39    Skipped: 1

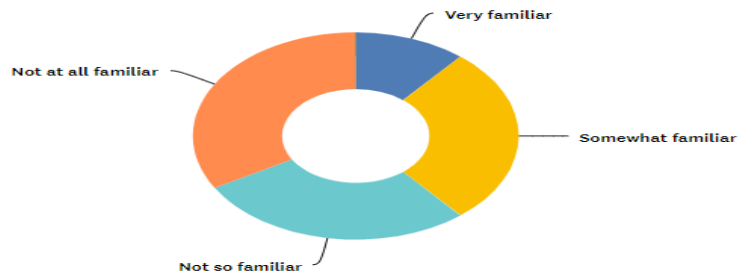


ANSWER CHOICES	RESPONSES	
Handheld displays (Smartphones, Tablet)	56.41%	22
Head Mounted Displays (Smart Glass)	17.95%	7
Projector based display	25.64%	10
TOTAL		39

## Questionnaires for Parents:

How familiar are you with the concept of Augmented Reality?

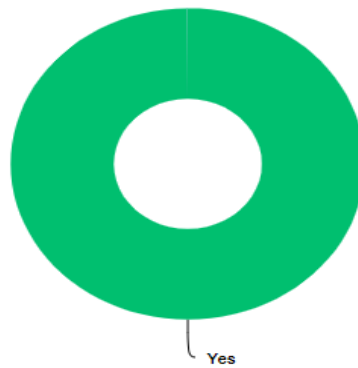
Answered: 18 Skipped: 0



ANSWER CHOICES	RESPONSES	
Extremely familiar	0.00%	0
Very familiar	11.11%	2
Somewhat familiar	27.78%	5
Not so familiar	27.78%	5
Not at all familiar	33.33%	6
TOTAL		18

Do you have smartphones at your home (accessible to your child)?

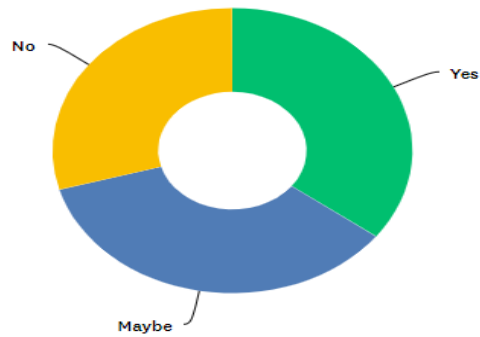
Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	100.00%	17
No	0.00%	0
TOTAL		17

## Can you afford 3D supported devices?

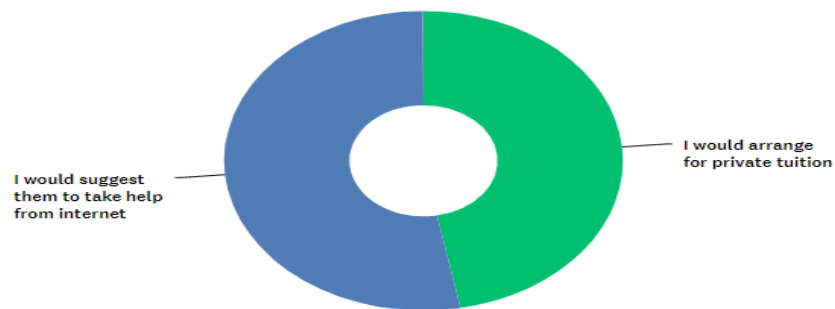
Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
▼ Yes	35.29%	6
▼ Maybe	35.29%	6
▼ No	29.41%	5
TOTAL		17

## Select your preference (In case your child faces problem while studying)

Answered: 17 Skipped: 1

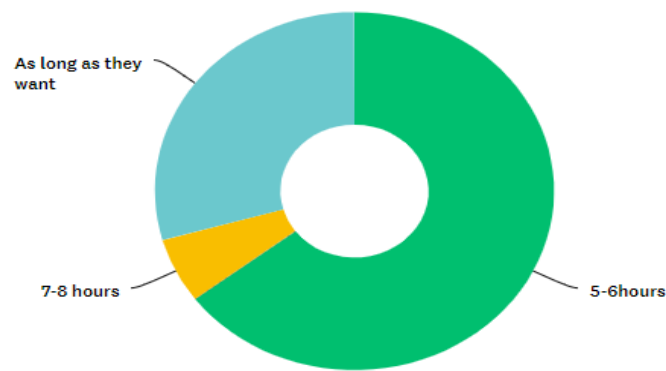


ANSWER CHOICES	RESPONSES	
▼ I would arrange for private tuition	47.06%	8
▼ I would suggest them to take help from internet	52.94%	9
▼ I would do nothing.	0.00%	0
▼ If you have other preferences please specify.	Responses 0.00%	0
TOTAL		17



How long are you comfortable to allow your child to be on internet other than school activities?

Answered: 17    Skipped: 1



ANSWER CHOICES	RESPONSES	
5-6hours	64.71%	11
6-7 hours	0.00%	0
7-8 hours	5.88%	1
As long as they want	29.41%	5
TOTAL		17