

Towards better Interaction between Students and Lecturer in Computer Lab Environment through a different Lab Design: Survey Results

Ahmad Azzazi, Shadi R. Masadeh and Nidal Turab

Faculty of Information Technology

Applied Science University, Isra University

Amman-Jordan

{a_azzazi, sh_almasadeh}@asu.edu.jo, nedalturab@ipu.edu.jo

Abstract— In this research, we are presenting the results of a survey done in a computer lab at the faculty of information technology. The computer lab was redesigned into a new lab design which should serve the goal of better interaction between the lab instructor and the students taking the lab. This new lab design is shaped as double V's where there were no obstacles for the instructor while moving in the lab helping the students on their computers.

Keywords: computer lab design, instructor student interaction in a computer lab environment.

1. INTRODUCTION

Nowadays there is a flood of information reaching everyone through different Media such as the World Wide Web, mobile phones, etc. This information age suggests that more people are involved in the industry developing such systems, which leads to more and more people are studying computer related programs and courses. Many universities open new courses related to the different usage of computer systems. They began to design labs for such courses. With time there was a need to redesign the lab for improvements in the interaction between instructors and students in these labs.

2. RELATED WORK

Various researches had proposed designs of lab environments, Judi, H.M.; Yeoh Zhi Cheng [8] proposed new layout designs of the laboratory in general, they show that some modification is required to improve the current layout and fulfil a better environment for teaching and learning process. John Garger; Eric Stallsworth[7] studied three computer lab designs : the Classrooms Computer Lab Designs, Four-Leaf Clover and the U-shaped design, they conclude that the key is to make sure form is following function. Thought and planning at the beginning of designing the lab ensures that students and instructors are satisfied with what the lab offers.

Our new design allows the instructor to move freely through the lab and interact with the students in a better way.

The rest of this paper is organized as follows: Related Work is described in Section 2. The proposed computer lab design is discussed in Section 3. Survey and its results are discussed in sections 4 & 5. Finally conclusions are drawn in section 6.

3. THE PROPOSED COMPUTR LAB DESIGN

At the sample university (the applied science university, Amman Jordan) there are many computer labs at the faculty of information technology with the old lab design (all computer are placed in series after each other as shown in Figure 1).

After a suggestion of the authors and the acceptance of this suggestion by the dean of the faculty a lab with a new design is done. The new design is made through putting the computers as shown in Figure 2.

Compared to the old computer lab design shown in figure 1, with the proposed computer lab design the instructor could move through lab without any obstacles enabling him to reach any student in the lab to help; this was not possible with the old design for the students in the corners. The oblique design in the middle helps the students to see the instructor, whiteboard of the data show in better way.

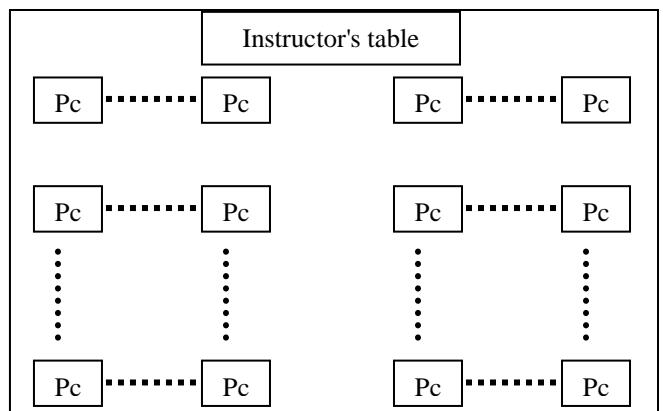


Figure 1: old computer lab design

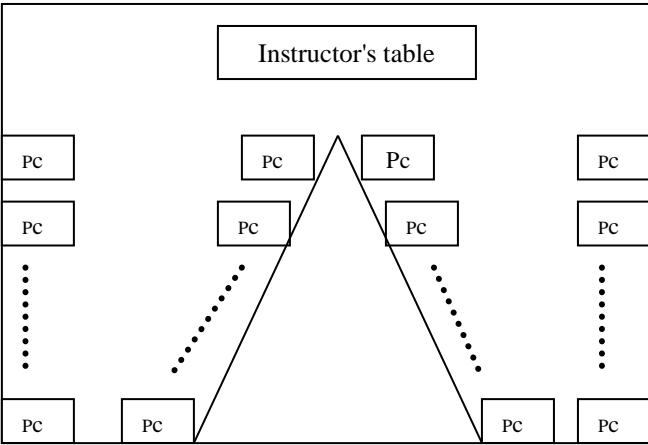


Figure 2: The proposed computer lab design

4. THE UNDERTAKEN SURVEY

A survey over students and instructors was undertaken to get feedback on the new lab design and the old lab design. The students used to use labs in the old lab design and then they are moved to the new designed lab. In this new designed lab 6 different lab courses were given to 6 different groups of students with 6 different lab instructors.

The total number of the questioned students in the 6 different classes was 83 students.

The closed questionnaire was divided into the following sections:

Section 1. General information about the lecture given in the lab, which included 5 questions, to give the degree to which the students believed about the practical and the theoretical parts of the lab course.

Section 2. The process of tracking the students in the lab which included 9 questions which was the most important part of the questionnaire. This part should reflect the goal of this study in measuring the interaction between the instructor and the students in the lab.

Section 3. General information about the lab equipments including hardware, software, the placement of the whiteboard, the placement of the data show, temperature of the lab and the lightning of the lab. This part of the questionnaire should serve to find if there are any reasons influencing the opinion of questioned students, where the results of this part could be related to the second section of the questionnaire.

5. SURVEY RESULTS

The results of this survey are described in this part, where it is divided through the questionnaire section and the subdivided through each question of that section .

5.1. General information about the lecture

In this section, we have summarized the information about the lecture as follows:

5.1.1 Type of the lecture

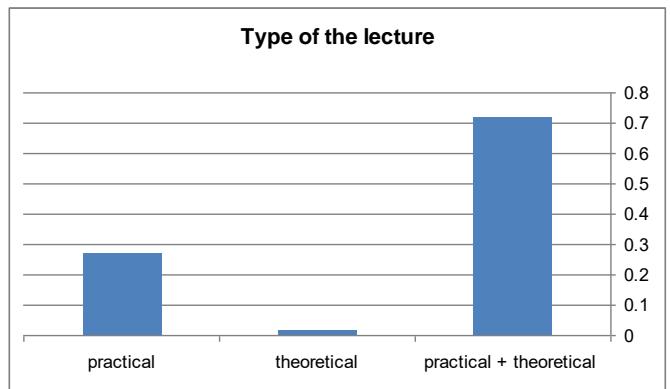


Figure 3: Type of the lecture

Figure 3 shows that over 70% of lecture is mixed practical and theoretical and only about 28% find it as a pure practical.

5.1.2 Percentage of the practical part

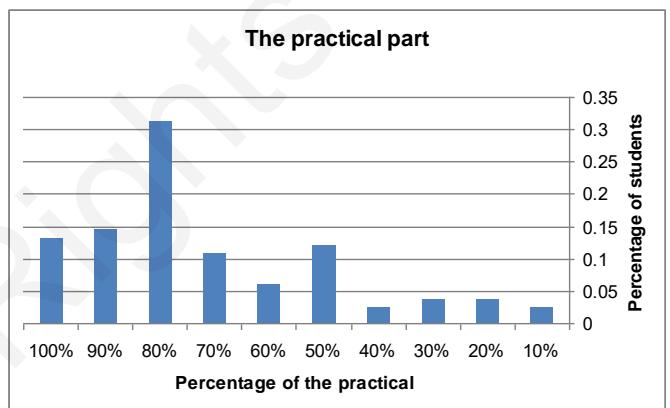


Figure 4: Percentage of the practical part

The mean of figure 4 is of about "70% the percentage of lecture is a practical ". Therefore most of the students find the lab as a practical.

5.1.3 Percentage of the theoretical part

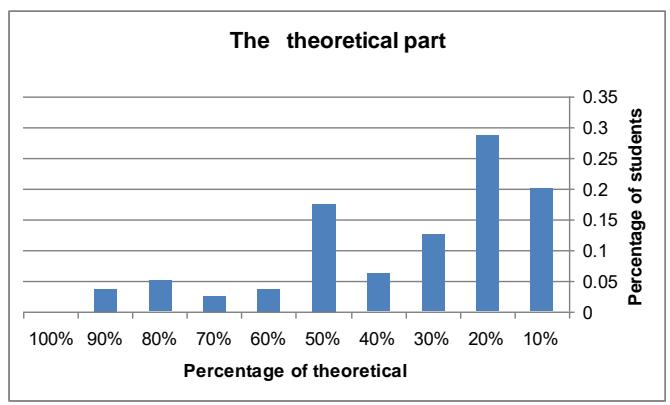


Figure 5: Percentage of the theoretical part

The mean of figure 3 is of about "30% the percentage of lecture is a theoretical ". Therefore most of the students find the minimum part of the lecture is theoretical.

5. 2. The process of tracking the students in the lab

In this section, we have described the types of interaction processes of the students as follows:

5.2.1 Direct interaction need

The following question was asked: "Do you believe that the nature of the lecture you are taking in this lab needs to have a direct interaction with the lecturer on the student's computer?"

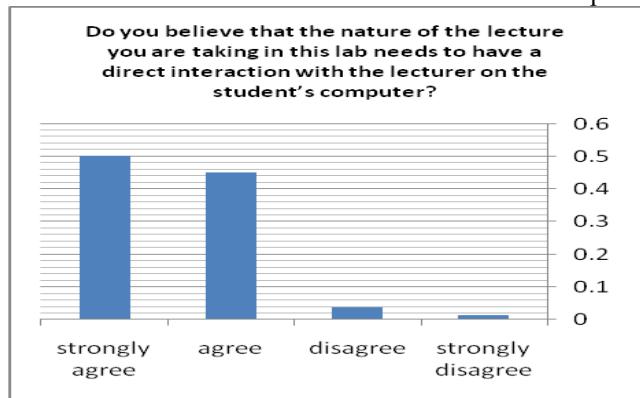


Figure 6: Direct interaction

Figure 6 shows that over 95% of the students believe that the nature of the lecture they are taking in this lab needs to have a direct interaction with the lecturer on the student's computer.

5.2.2 Better interaction found.

The following question was asked: "Do you believe that the interaction with the lecturer in this new designed lab better than in the old designed lab?"

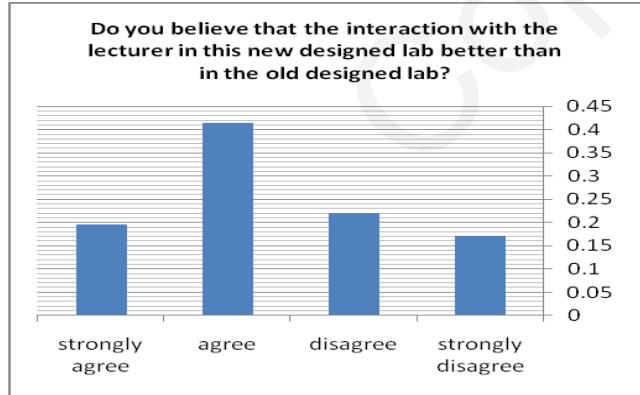


Figure 7: Better interaction found.

Figure 7 shows that over 60% of the students believe that the interaction with the lecturer in the newly designed lab is better than the old designed lab. Only 15% strongly disagree with this statement.

5.2.3 Moving between the student's computers

The following question was asked: "Do you believe that moving (reaching) between the student's computers in this new designed lab better than that in the old lab?" [5]

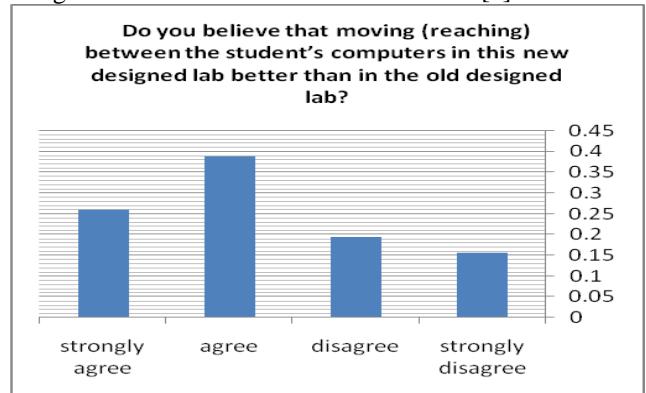


Figure 8: moving between the student's computers

Figure 8 shows that 65% of the students that moving (reaching) between the student's computers in this new designed lab better than in the old designed lab. Only 15% disagree strongly with this statement.

5.2.4 Help of the students

The following question was asked: "Do you believe that you can help the students in this new designed lab better than in the old designed lab?"

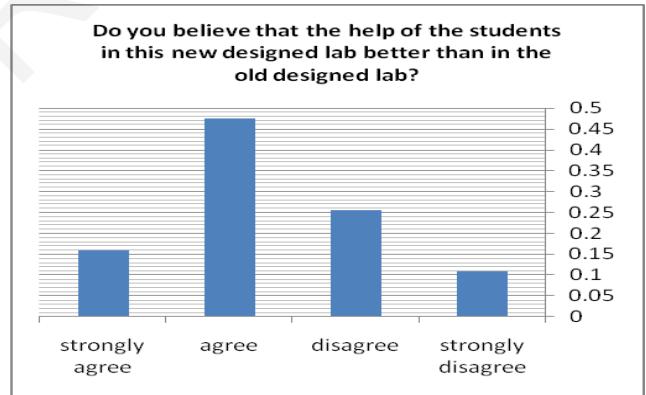


Figure 9: Help of the students

Figure 9 shows that over 65% of the students believe that they get help in the new designed lab is better than that in the old lab. Only 10% strongly disagree with this statement.

5.2.5 Monitoring the activities of the students

The following question was asked: "Do you believe that monitoring the students' activities in this new designed lab better than the old designed lab?"

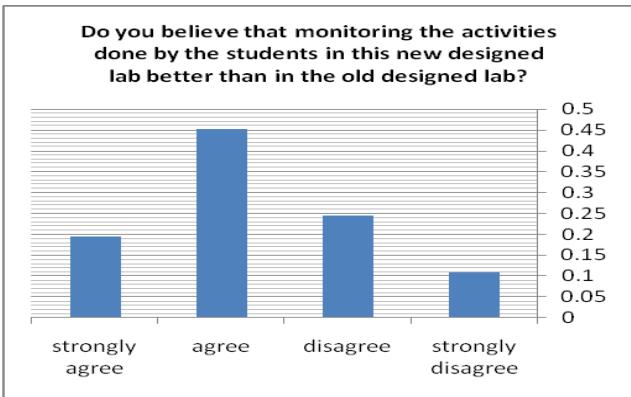


Figure 10: Monitoring the activities of the students

Figure 10 shows that about 70% of them believe that monitoring the students' activities done by the students in this new designed lab better than that in the old lab. Only 10% strongly disagree with this statement.

5.2.6 Direct answering on the student's computer

The following question was asked:

"Do you believe that answering in a direct way on the student's computer is done better in this new designed lab than in the old lab?"

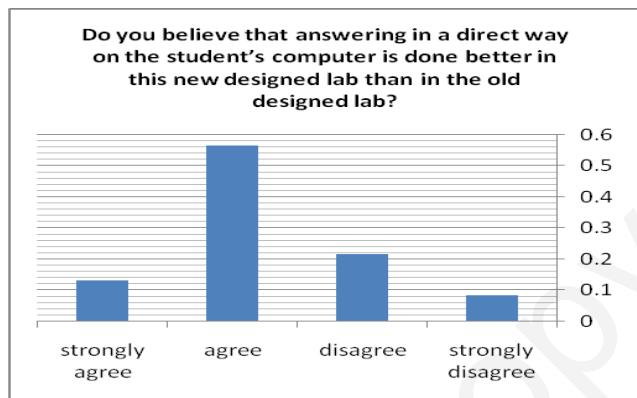


Figure 11: Direct answering on the student's computer

Figure 11 shows that about 70% of students believe that answering in a direct way on the student's computer is done better in this new designed lab than that in the old lab. Only 8% strongly disagree with this statement.

5.2.7 Proposed computer lab design

The following question was asked: "Do you believe that the design in general is better in this new designed lab than in the old designed lab?"

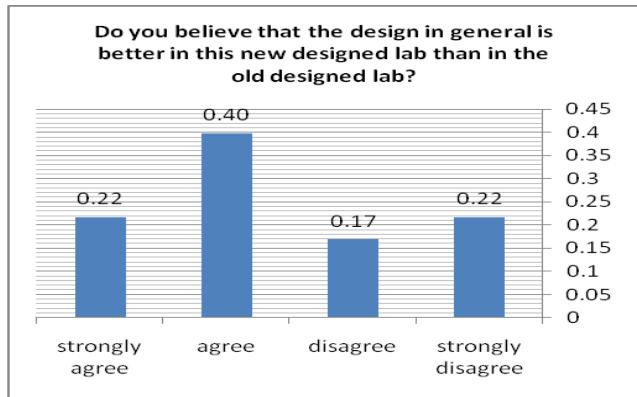


Figure 12: New lab design

Figure 12 shows that about 62% of students believe that the design in general is better in this new designed lab than in the old lab. Only 22% strongly disagree with this statement.

5.2.8 Taking courses in the new designed lab

The following question was asked: "Do you believe that you will take courses in this new designed lab rather than the old designed lab?"



Figure 13: taking courses in the new designed lab

Figure 13 shows that about 65% of students believe that they will take courses in this designed lab rather than the old designed lab. Only 20% strongly disagree with this statement.

5.2.9 Movement problems in the Proposed designed lab

The following question was asked: "Do you have any movement problems in this new designed lab?"

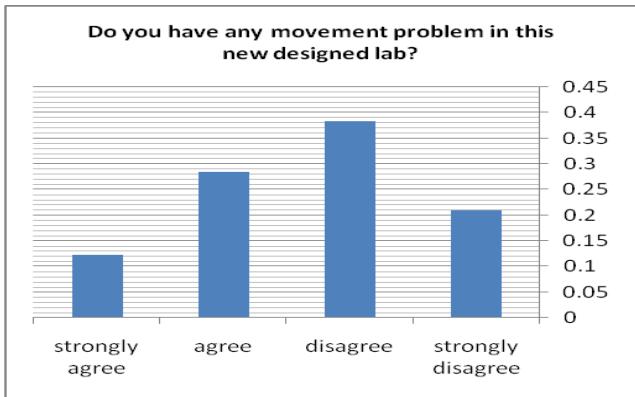


Figure 14: movement problems in the new designed lab

Figure 14 shows that about 40% of students believe that they have any movement problems in this new designed lab. But about 60% of students believe that they do not have any movement problems in this new designed lab.

5.3 General information about the lab equipment

In this section, we have showed the General information about the lab equipment as follows:

5.3.1 Computers in the lab have high performance

The following question was asked:

"The computers in this lab have high performance?"

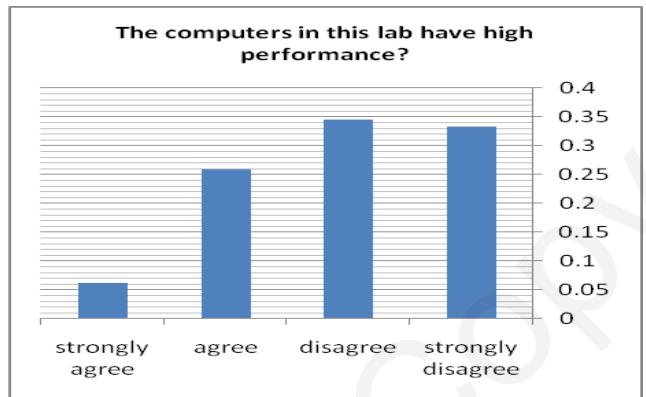


Figure 15: computers in the lab have high performance

Figure 15 shows that about over 65% of students believe that the computers in this lab do not have high performance. Only 5% strongly agree with this statement.

5.3.2 Software in the lab has high performance

The following question was asked:

"The Software in this lab has high performance?"

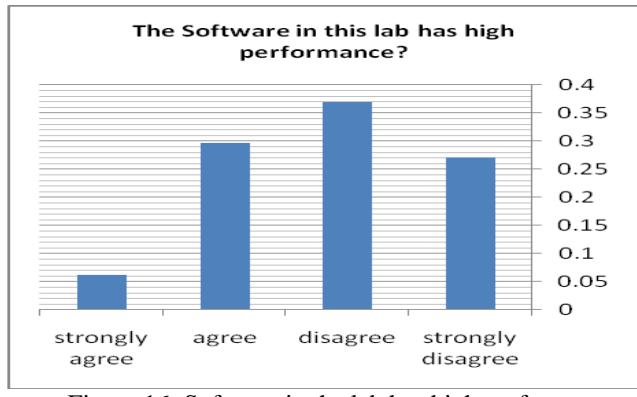


Figure 16: Software in the lab has high performance

Figure 16 shows that about over 65% of students believe that the software in this lab do not have high performance. Only 5% strongly agree with this statement.

5.3.3 Placement of the whiteboard in the lab

The following question was asked:

"The placement of the whiteboard in this lab is suitable?"

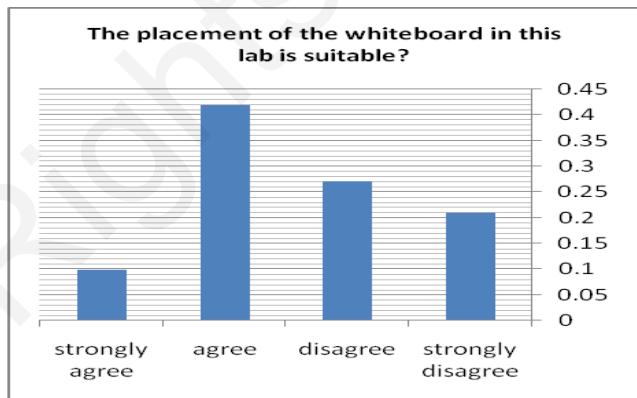


Figure 17: Placement of the whiteboard in the lab

Figure 17 shows that about over 45% of students believe that the placement of the whiteboard in this lab is not suitable. Only 10% strongly agree with this statement.

5.3.4 Placement of the data show in the lab

The following question was asked:

"The placement of the data show in this lab is suitable?"

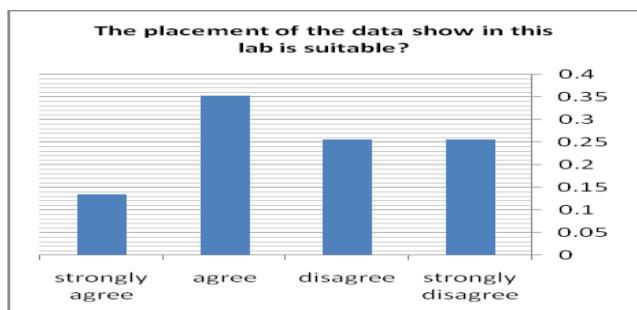


Figure 18: placement of the data show in the lab

Figure 18 shows that about over 50% of students believe that the placement of the data show in this lab is not suitable.

5.3.5 Lightning in the lab

The following question was asked: "The lightning in this lab is suitable?"

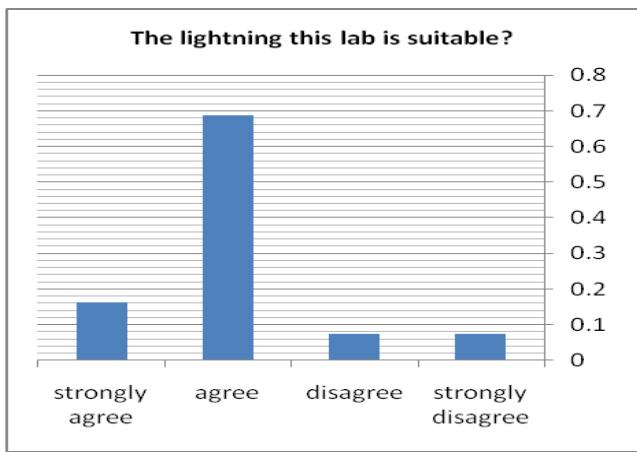


Figure 19: Lightning in the lab

Figure 19 shows that about over 85% of students believe that the lightning in the lab is suitable.

5.3.6 Temperature in the lab

The following question was asked: "The temperature in this lab is suitable?"

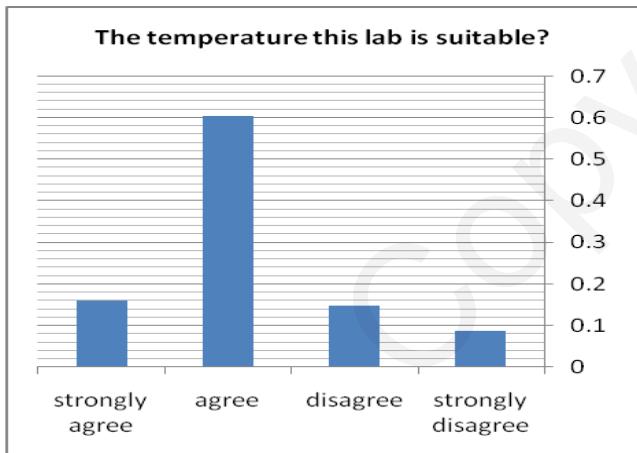


Figure 20: temperature in the lab

Figure 20 shows that about 77% of students believe that the temperature in the lab is suitable.

6. SURVEY RESULTS SUMMARY

- Type of lecture is mixed practical and theoretical
- The students find the lab as a practical
- Over 95% of the students believe that the nature of the lecture they are taking in this lab needs to have a direct interaction with the lecturer on the student's computer.
- Over 60% of the students believe that the interaction with the lecturer in the new designed lab better than that in the old designed lab
- About 65% of the students believe that moving (reaching) between the student's computers in this new designed lab is better than that in the old designed lab
- About over 65% of the students believe that the help of the students in this new designed lab better than that in the old designed lab
- About 70% of the students believe that monitoring the activities done by the students in this new designed lab better than that in the old designed lab.
- About 70% of students believe that answering in a direct way on the student's computer is done better in this new designed lab than that in the old designed lab.
- About 62% of students believe that the design in general is better in this new designed lab than that in the old designed lab.
- About 65% of students believe that they will take courses in this new designed lab rather than the old designed lab.
- About 60% of students believe that they do not have any movement problems in this new designed lab.
- About over 65% of students believe that the computers in this lab do not have high performance.
- Over 65% of students believe that the software in this lab does not have high performance.
- Over 45% of students believe that the placement of the whiteboard in this lab is not suitable.
- Over 50% of students believe that the placement of the data show in this lab is not suitable.
- Over 85% of students believe that the Lightning in the lab is suitable.
- About 77% of students believe that the temperature in the lab is suitable.

7. CONCLUSIONS AND DISCUSSIONS

From the results of the survey are showing we can conclude as follows:

I- The students look for a practical lecture in the lab more than a theoretical one.

II- The students need a direct interaction with the lecturer on their computers.

III- The majority of the student believes that the interaction with the lecturer in the new designed lab is better than that in the old designed lab.

V- The majority of the students believe that the help of the students in this new designed lab is better than that in the old designed lab. VI- The majority of students believe that the design in general is better in this new designed lab than that in the old designed lab. VII- Some of the students are negatively influenced because they are not satisfied with the hardware and software of the pilot lab.

ACKNOWLEDGMENT

The authors are grateful to the Applied Science Private University, Amman, Jordan, for the Full Financial support granted to this research project

REFERENCES

- [1] Bill Madden, Anita Verno, Debbie Carter, Steve Cooper, Thomas J. Cortina, "A Model Curriculum for K-12 Computer Science,Level III Objectives and Outlines", CSTA Level III Task Force 2007.
- [2] Shneiderman, B., "Designing the user interface. Strategies for effective human-computer interaction". Addison-Wesley, 1992.
- [3] Barrows, H., A taxonomy of problem-based learning. Medical Education, 1988. 61: p. 481-486.
- [4] The Joint Task Force on Computing Curricula,IEEE Computer Society, Computer Engineering 2004,Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering, A Report in the Computing Curricula Series, Association for Computing Machinery,2004.
- [5] Sheryl E. Burgstahler, Rebecca C. Cory" Universal Design in Higher Education From Principles to Practice" Harvard Education Press, Cambridge, MA: ISBN: 9781891792908, 2010. P.P.187-235
- [6] Sheryl Burgstahler" Equal Access: Universal Design of Computer Labs"<http://www.washington.edu/doit/Brochures/Technology/comp.access.html>
- [7] John Garger ; Eric Stallsworth" The Four Best Computer Laboratory Layouts for schools " URL:<http://www.brighthub.com/computing/hardware/articles/52714.aspx> May 18, 2011.
- [8] Judi, H.M.; Yeoh Zhi Cheng "A case of computer laboratory layout modelling and analysis" Electrical Engineering and Informatics (ICEEI), 2011 International Conference on July 2011