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(Chapter One)

1. Introduction:

Every teacher should ask himself this question: how can I improve the quality of vocational education? to answer this question we need to take a look at several aspects that underpin educational process. So, first we'll look at the modern and the traditional approaches in education. Then we should know the concept of teaching methods as well. Why should we change the teaching methods in the classroom constantly? , How does this affect students, teachers and whole educational process?.

The purpose of this search is to explain to junior teachers the importance and the impact of changing teaching methods used in vocational pedagogy on students. Then, we will look at the concept of simulation, why simulation is important in vocational pedagogy?, its types : real and computer simulations , applying them to the students, test for its effectiveness by surveys and its advantages and disadvantages.

Also, we will know concept of interactive media, interactive media In the field of education, why does interactive media important in vocational pedagogy, features of interactive media, applying to the students and then test for its effectiveness by surveys, its advantages and disadvantages. Finally, there hints and tips at the end of each chapter to help the junior teachers in order to raise the level of his performance and quality of educational process, in addition to recommendations that at the end of the research.

(Chapter Two)

2. Two approaches for education:

Traditional and modern education approaches are actually complementary to each other, there is no complete contradiction between them. Some supporters of the modern approach say that the traditional approach carries the disadvantages compared to the pros of the modern approach, but that is not true every approach has positive and negative aspects.

2.1 Traditional approach:

In the traditional teaching the teacher is the controller of the learning environment. He has the power and responsibility. The teacher plays the main role (in the form of lectures) and he is the one who makes the decision in regards to curriculum content and how the students will be evaluated. It depends on some methods like rules, plans, and tests aiming to efficiency and cost cutting. The traditional approach of teaching is an old teaching approach however and there are some teachers still use it until now.



Figure¹: Traditional approach.

2.1.1 Advantages for Traditional approach:

Centered on the teacher: It is influenced by the teacher efficiency and abilities to achieve the goals of education in which the teacher is an essential source of knowledge.

Limited by time and location: Meet in a classroom with the teacher at a specific time for the learners, the education process ends by the end of time and leaving the place.

2.1.2 Disadvantages for Traditional approach:

Human Relations: It is an important part of the evaluation and observation of the human behavior and the satisfaction of innate social aspect of the learner.

Time: The teacher can end the curriculum in a short period.

2.2 modern approach² :

Education in the modern approach is not an operation for the transfer of information, but it is a planned activity aims to achieve educational outcomes required. The teacher plans and manages this activity. This means that there are new roles for both the teacher and the learner according to these advanced perception of the teaching process. As the teacher's role won't be limited to present information. Thus students' role won't be limited to keep information in preparation for conservation.



Figure³: modern approach .

2.2.1 Advantages for modern approach:

Centered on the Learner: It focuses on the learner to be the basis of the learning process, and help him to choose the educational components that is suitable for him and interact with them.

Unlimited time or place: The learner can choose the right time and from anywhere to complete the learning process.

2.2.2 Disadvantages for modern approach:

There are some disadvantages of the educational process in the modern approach:

- The teacher does not have sufficient means sometimes.
- Technique is not equipped fully or the infrastructure is not ready.

Hint: there are advantages and disadvantages in the modern approach. So we need to integrate both approaches to benefit from their advantages and overcome their disadvantages and thus increase the quality of the educational process.

²For more from comparison between the traditional and the modern approach please refer to the index.

³<http://cutt.us/WCVFD>

(Chapter Three)

The teacher is ready to deliver the lesson while the students are excited for the lesson. The educational material is with the students and the teacher. So, what they needs now is the teaching method to show information and knowledge. Thus, let us discover what is the teaching method ?

3. Teaching Methods :

The teaching methods is defined as the organized events run by the teacher in the classroom to achieve his objectives. For example the mechanism by which the teacher regulates the educational attitudes. He uses the means and the various activities according to the steps of educational attitudes and according to the organized steps to give the learners the knowledge, skills and desired trends.

3.1 Why should we change the teaching methods?

Scientists and interested ⁴ says that the human brain absorbs , records and saves by the interaction between the five senses such as lecture, discussion and hands-on training.

❖ **Lecture:**

the oldest method of teaching and the most common way, I will define it like what Dr. Rainer defined it is "the teacher delivers his knowledge via lectures to students who are more or less silent participants. Lectures are best used when an teacher wishes to convey a general understanding of a subject that students lack."⁵

• **Features:**

- Help to add some additional information that does not exist in the book.
- Help to train students the skill of listening.
- Ease of use compared with other methods, they need only to listen from students.

⁴If you want to see samples of the studies please refer to the index.

❖ **Discussion:**

the teacher in this way creates a positive climate between him and the students by placing the issue known to him and asked for discussion. the teacher must hear from all students, whether their opinion right or not, and exchange views between him and them. Then he comments on their views of what is true and reliable for his part and correct their information in nice and harmless way.

• **Features:**

- Full interaction between the teacher and his students.
- This method helps to consolidate and install the information in the minds of students.
- dispersion of boredom for students.

Other scientists and interested ⁶ have proven that there are other ways to teach, such as discovery learning and learning by peers , which helps the student to keep information for a longer time and give him some positive things as follows:

❖ **Discovery learning**

It is the thinking process that requires from the student to reorganize his stored information to enable him to see the new relationships that he didn't know before.

• **Features:**

- Discovery lessons help students to increase their ability to analyze, synthesize and evaluate information in a rational way.
- Students learn through their integration into the discovery lessons
- Some methods and activities necessary for detection of new things by themselves.
- Develop the students' attitudes and strategies in problem-solving and research
- The tendency to educational tasks and a sense of fun and self-realization when they get to discover what.

❖ **learning by peers (Peer tutoring) :**

The student who is academically superior helps in teaching lower academic level students .

⁶If you want to see samples of the studies please refer to the index.

- **Features:**

- Creates a good social relationships between students.
- Develop language communication skills through bilateral interaction.
- Increases the motivation of the learner toward learning and school.
- Strengthens the concept of self-assertion and reduces frustration.
- Increases academic achievement for students (teacher) and student (learner).

3.2 Examples on teaching methods ⁷:

- **Brainstorming:**

Brainstorming is a powerful technique not only in teaching, but also in variable fields of life. Brainstorming is a technique to make the students generate new creative ideas and develop creative thinking.

- **Buzz groups:**

It is a type of discussion teaching in which the teacher would divide his large class into small groups .

- **interactive media and Simulations :**

we will discuss them in detail in the next chapter.

Hint: A good teacher should change the teaching methods used constantly. He also should develop a plan for each lesson includes five senses. In addition, learning by discovery , learning by peers , learning by fun .He can integrate more styles to ensure that information will be understood by the largest segment of his students

⁷If you want to learn more about teaching methods and examples please refer to the index.

(Chapter Four)

Who among us has not dreamed one day of driving a plane. It provides a fun environment for learning, but it is difficult to provide a lot of devices, materials, tools, either to their large size or high cost. The solution lies in so-called simulated, so what is it and what its role in education.

4. Simulation:

is an educational method or technique used by the teacher usually to bring students to the real world. It is difficult to be provided to learners because of material cost or human resources. It is educational scenarios, teacher puts student directly to represent the real world. It is working on the development of critical thinking and the ability to assessment of the learner.



Figure⁸: Simulator to drive plane.

4.1 Why simulation is important in vocational pedagogy:

Vocational pedagogy depends largely on the practical side. There are many fields such as auto mechanics, communications and electricity etc. That are difficult to use real application during training time. So, the right and effective solution is programs and devices simulations or real simulation .

[^]<http://cutt.us/iGUxx>

4. 2Types of simulations :

4.2.1Real simulations :

- **Physical Simulation:** is related to dealing with physical things and identifying them. It includes the operating devices or tools.
- **Procedural simulation:** aims to learn a series of works or steps with the aim of developing the skills or activities to act in a certain position, such as training on the steps running machine or disease diagnosis in the training of doctors .
- **Simulation attitudinal:** In this type the learner is a key role in the scenario which displays is to discover the attitudes of appropriate responses by repeating the simulation.
- **Simulation of a process:** student has no role. He is an observer . he has to notes and connect relations. Then learn the free discovery.

4.2.2Simulations computing:

is a computer program or a network of computers trying to simulate the action of the system or a certain problem

- **Simulate the kinetics:** This type is used to simulate the kinetics of certain skills and performance. It is done by the use of tools that are added to the computer to be in a situation very similar to reality, such as simulation of driving the plane.
- **Procedural simulation:** often depends on learning through the computer screen ,where design a educational position is similar to the reality, such as simulation for practical experience.
- **Simulate a process:** these simulations are built in the form of model explains the phenomenon that cannot be seen in its natural state, such as the electron movement within the atom.

4.3 Advantages of simulation:

- helps to avoid the risk of large cost in solving problems through the preparation of experience without addressing the real problem, but only through the representation of the problem.
- style simulation helps to provide the shortest time in solving problems as problems that face us in reality and takes a long time to solve.
- It is difficult to make changes in the real experiments, but simulation provides a more flexible compared to reality.
- The simulation method helps to identify the difficulties in solving the problem.
- the simulation plays an important role in study and solve the complex problem.
- the most important advantages of the computer simulation programs that it offers nontraditional educational positions for the learner in a way that raises his thinking and motivates him to learn.

4.4 Disadvantages of simulation :

- requires a great deal of planning to get ready and effective.
- requires equipment with special specifications.
- Needs team work of teachers, programmers, engineers, and also need time and effort.

4.5An example of the application of real simulations:

This lesson has explained to Semester (8) .

The place: Technical Trainers College.

Course : AVP 4.

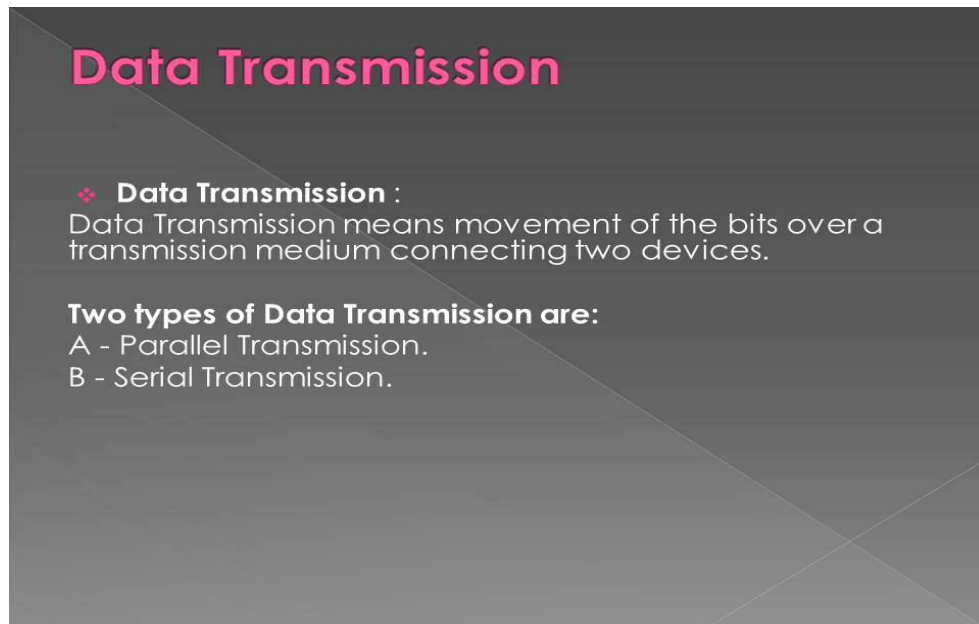
Topic: Introduction to Mobile Communications.

Number of students: 17 .

❖ **Table of contents:**

- **Terminologies of Data communication.**
- **History of Data Communication.**
- **Data Communication .**
- **Data Communication Circuit.**
- **Components of data communication system.**
- **Tasks of Communication .**
- **Data Transmission.**
- **Signals.**
- **Applications .**

I used many methods to explain these points , and I have used the simulations to explain "Data Transmission". The following are PowerPoint slides that display "Data Transmission" of the lesson.

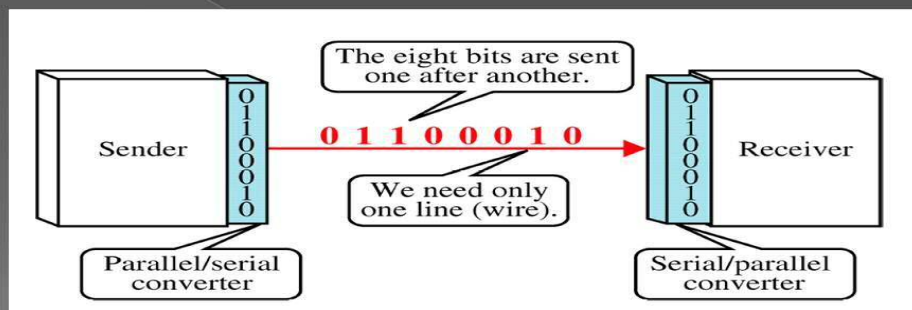


Data Transmission

Serial Transmission

Bits are transmitted one after the other
Usually the Least Significant Bit (LSB) is transmitted first
suitable for transmission over long distance
Less speed but simple circuit.

Serial Transmission



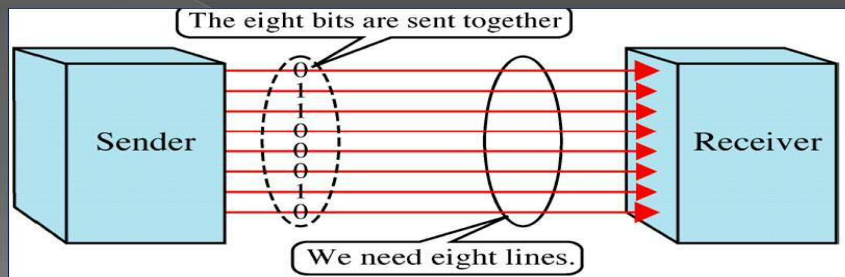
I asked new eight volunteers students (kind of activity inside classroom and involvement of all students) to represent the transition of (1 byte) from one device to another, I gave each student a paper written on it (1-bit). Then I asked them to stand in a straight line next to each other. I asked them to move one after the other in only one line, in a separate time from the sending device to the receiving.

Data Transmission

• Parallel Transmission :

In this all the bits of a byte are transmitted simultaneously on separate wires. Practically, if two devices are close to each other e.g. Computer to Printer, Communication within the Computer
High speed but complex circuit .

Parallel Transmission



I asked eight volunteers students to represent the transmission of 1 byte from one device to another. Then I gave each student a paper written on it (1-bit) . After that I asked them to stand in a straight line every student behind the other. Then I asked them to move at the same time from the sending device to the receiving device, each student follow a separate line is drawn on the ground of the classroom (By erasable pen) the devices are used for the purpose of using the imaginary part of the brain in education.

4.6 Test the effectiveness:

This small questionnaire was after three months from this presentation to test effectiveness of the real simulations .

Dear students this survey has been done in order to help teachers what is the best way to teach you. So please help us to find that.

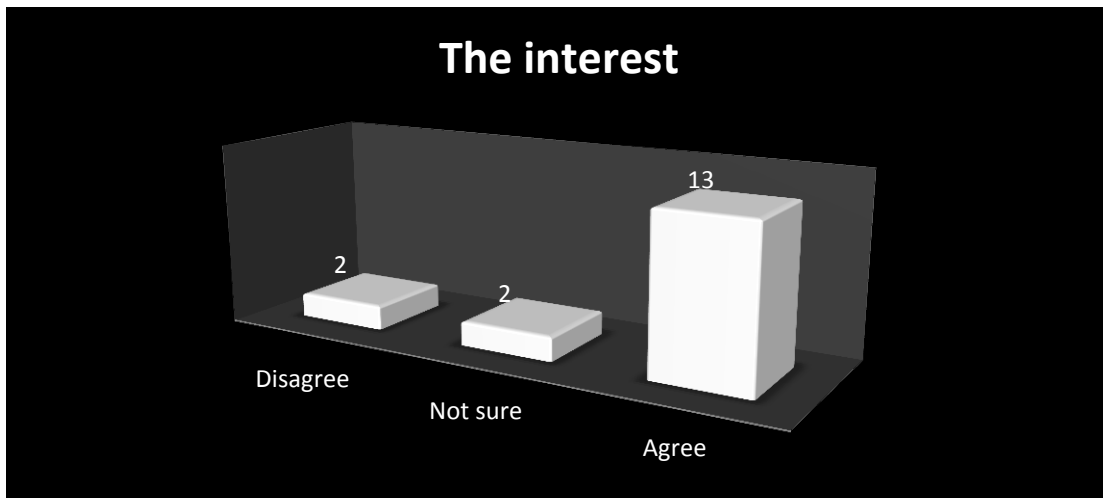
1- Was the simulation for data transmission useful for you?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on interest is high compared to disagree or not sure

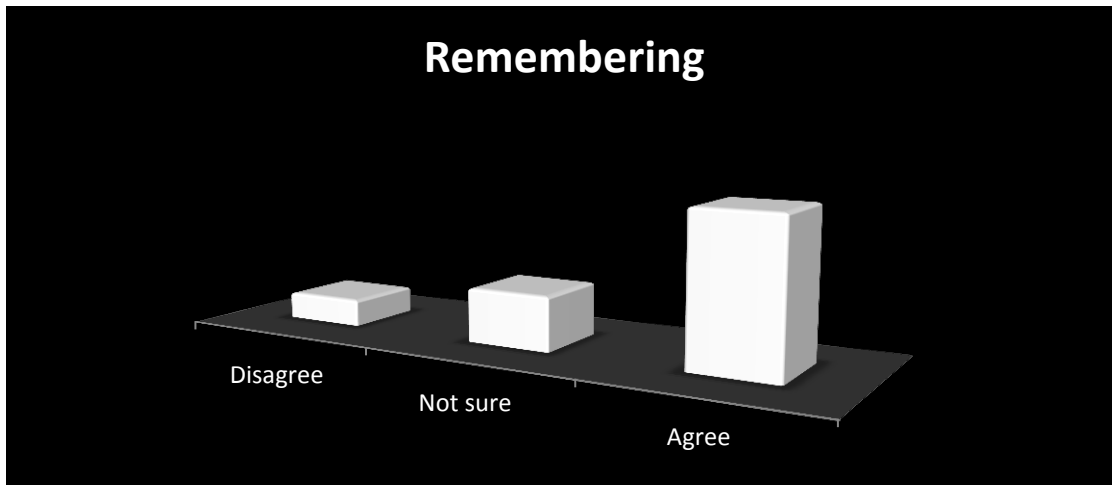
2- Do you remember the kinds of data transmission in mobile communications?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on remembering is high compared to disagree or not sure.

3- In your opinion, what are the main reasons that make real simulations useful for you as a student?

In brief, students remembered well . This experiment is one of the few points that still remember in the lesson.

Some students said they have studied the data transmission before, but they had a confusion between parallel and serial transmission. Thanks to this experience is completely solved this problem.

Others said that moving in the classroom and applying the simulation made them more focused and active

4.6.1 The Conclusion of the survey :

After the analysis of students' answers to the survey we conclude the following:

Teaching by using Simulation provided the desired interest to a large number of students. It helped them to remember what has been taught for a longer period. In addition the simulation showed and explained the lesson in an easy way. It made them more attracted and motivated during lesson.

4.7 An example of the application of Computer simulations:

The student needs to use much imagination. When studying disciplines that relate to (signals), (waves) and (cables) such as networks or communications. In order to link between information, infer relationships and new knowledge. It may be difficult to apply each lesson practically, but a program (**Packet Tracer**) solved this problem. It provides students simulation to each step and a tool in building networks in amazing way.

❖ Packet Tracer

configure the WLAN by using packet tracer by doing virtual WLAN.

A wireless local area network (WLAN) links two or more devices. It uses some wireless distribution method (typically spread-spectrum or OFDM radio). It usually provides a connection through an access point to the wider Internet. This gives users the ability to move around within a local coverage area while being connected to the network. Most modern WLANs are based on IEEE 802.11 standards

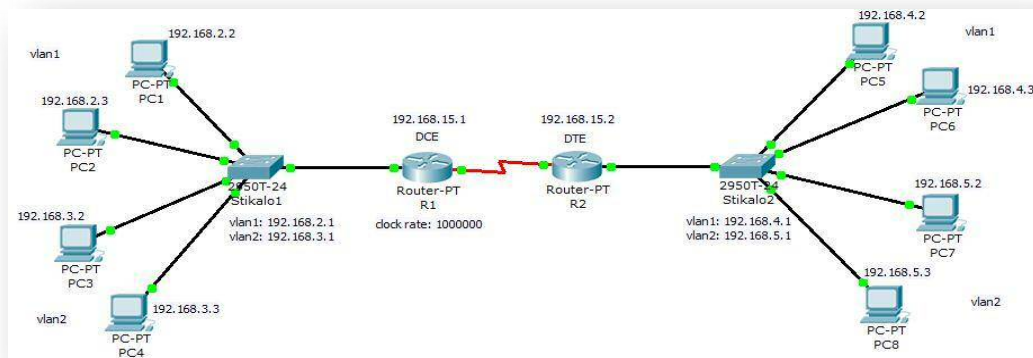


⁹ **Figure:** Packet Tracer

⁹ <http://cutt.us/hVN4r>

Packet Tracer is a powerful network simulator that can be utilized in training for CCNA and CCNP certification exam. It allows students to create networks with an almost unlimited number of devices, and to experience troubleshooting without having to buy real Cisco routers or switches. The tool is created by Cisco Systems.

The purpose of Packet Tracer is to offer students a tool to learn the principles of networking as well as to develop Cisco technology specific skills. However, it is not used as a replacement for Routers or Switches because it is Just a simulator



Figure¹⁰: simulate Internet access in Packet Tracer.

4.8 Test the effectiveness:

Simulation experiment : Packet Tracer is used by Telecommunications students at Technical Trainers College.

Course: mobile communication (AS4.4).

Student number is 17 students.

This small questionnaire was after three months from this experiment to test effectiveness of the computer simulations .

Dear students this survey has been done in order to help teachers discover what is the best way to teach you. So, please help us to find that.

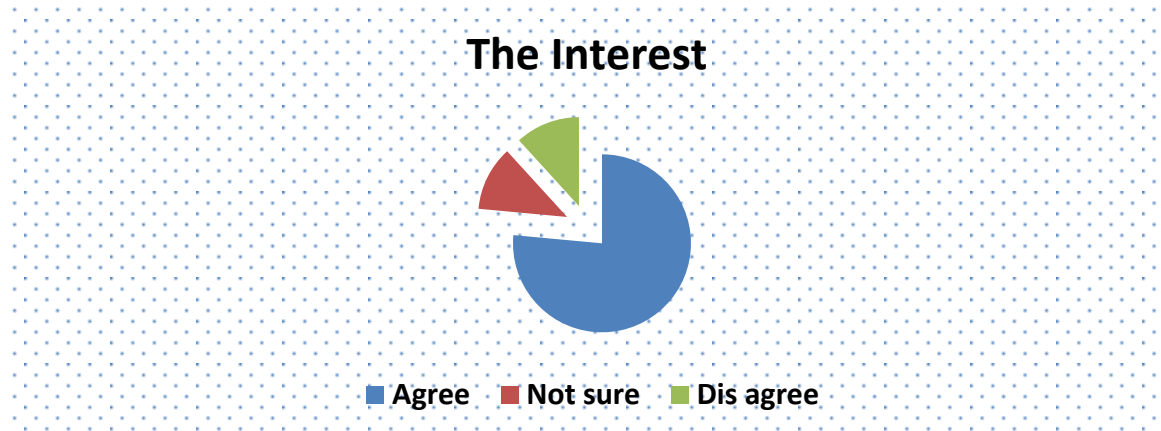
1- Was the experiment of Packet Tracer useful for you?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on interest is high compared to disagree or not sure

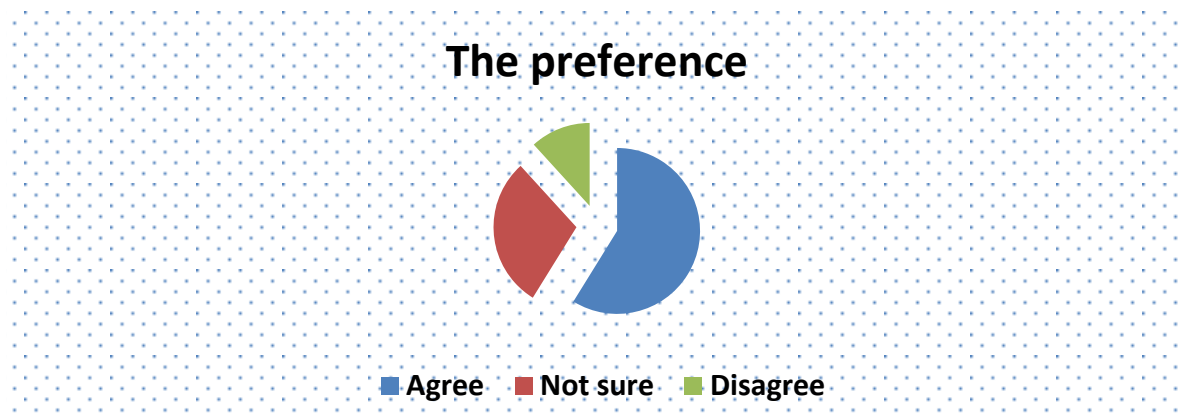
2- Do you prefer use it another time?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on preference is high compared to disagree or not sure.

3- In your opinion, what are the main reasons that make Packet Tracer useful for you as a student?

Summary of answers of this question was: it helped them to solve problems. It also motivated them for critical thinking, and make them understand the experiment easily and deeply. Some of them mentioned that they searched for Packet Tracer program on the Internet to get more information about it. Others mentioned that they still remember all the details, because it was enjoyable and clear. They also mentioned that real and computer simulations are still make a difference in their understanding of their specialization.

4.8.1The Conclusion of the survey:

After the analysis of students' answers in the survey we concluded the following: A large number of students voted to approval that computer simulation was useful to them and they prefer to try it again. This shows us a scarcity in the use of simulation in the field of vocational pedagogy. A large number praised its ability to make the lesson more easily and clearly to understand and give them new knowledge. In addition they mentioned that computer simulation gave them the ability to solve problems. It also has developed their skills of critical thinking. That is the most important feature of computer simulation. They also said it was an enjoyable experience and clear at the same time. One of the most important features in computer simulations is to offer non-traditional educational positions for students.

Hint: simulations motivates critical thinking and problem-solving method to the student. It provides him enjoyable environment for deep understanding learning. Thus, students gain knowledge and information outside of educational material.

(Chapter Five)

The field of technology, interactive media and software has much developed. There is a great interest in putting technology in education through computer and the Internet. That is done using designs that stir students while learning by many ways and different methods like texts, silent and animated shapes, sounds, images, music and video. Thus, the learner uses audio and visual senses and reading in the interaction to learn.

5. Interactive media:

It is a product that provides a mix of written texts, music, video, images, Internet, silent and animated shapes. The purpose of interactive media may be for entertainment, communication, learning, or in a commercial form.

.

5.1 Why does interactive media use important in vocational pedagogy?

There are many reasons for using interactive media in vocational pedagogy. The most important reasons is the revolution of communication and information in these days which resulted in the transfer speed of information. So, everything needs to be renewed and kept up with these changes to get efficiency to achieve the educational goals.

5.2 Features of interactive media:

1. Interactive: referring to action and reaction between learner and what he sees in the educational environment.
2. Integrative: multimedia works to integrate the principle of integration between different interactive media.
3. Student can communicate with centers of information spread all over the world, to get all kinds of information.
4. Individuality: interactive media provides advantage of individual use, because of individual differences between students.
5. Speed performance: programs of interactive media is considered the fastest and strongest programs for understanding and analyzing information.

5.3 Advantages of interactive media:

- Easiness of understanding information through motivating big number of human senses.
- It makes the educational process more exciting
- It provides enough time for the learner to work according to his speed without suffering from stress.
- It provide immediate feedback for the learner.
- It helps the student to know his real level through self-evaluation.

5.4 Disadvantages of interactive media :

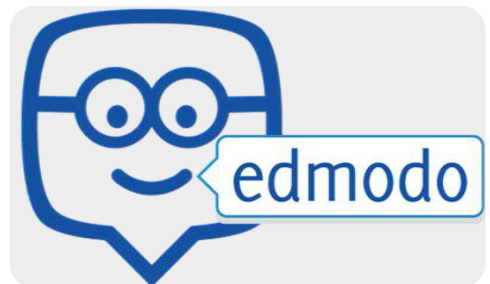
- It requires large financial possibilities to provide hardware, software and professional staff
- It requires high quality to specifications of the equipment and material used in production.

5.5 An example of the application of interactive media in education:

Most of us if not all have an account in one of social media websites for one purpose or another. It helps communicate with our friends or to follow celebrities in the fields of art, sports or etc. One of the best advantages of these sites is that they help us to learn. The program (Edmodo) is one of the examples of this feature.

❖ Edmodo:

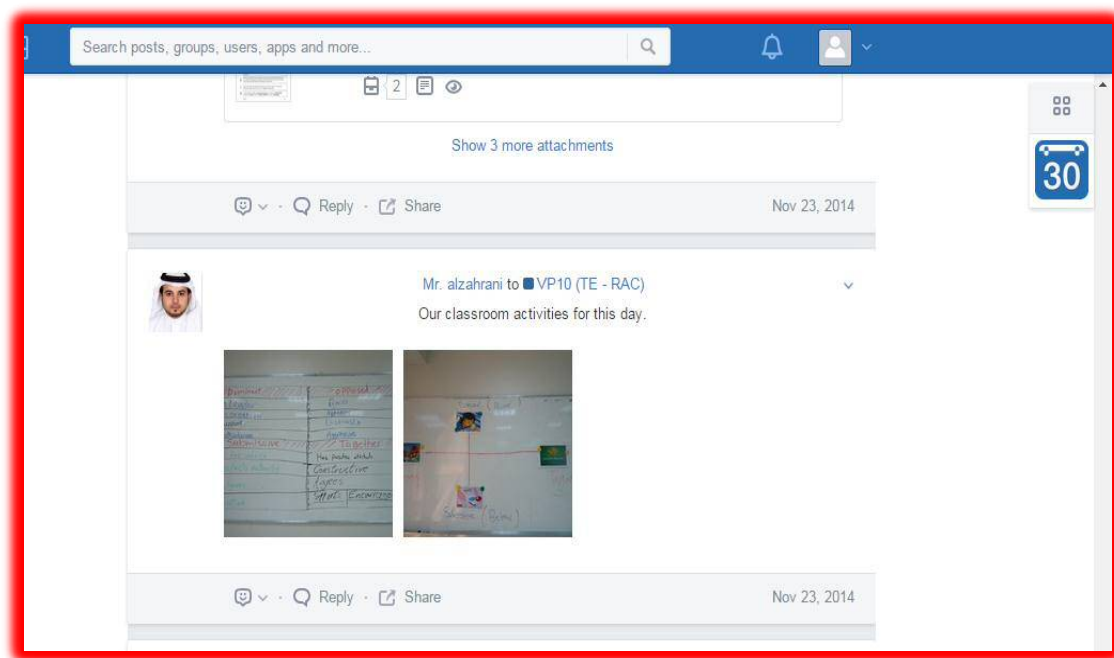
Facebook is the most popular social media websites on the Internet. Blackboard is the information system for managing education, follow-up of students, and controlling them. This system is a big chance for students to communicate with text courses and teachers outside



Figure¹¹:edmodo icon

<http://cutt.us/wvBP>

It contains communication, participate and interaction with each other electronically. The teacher is the controller. He communicates with students through an voice messages and discuss their grades, their test and duties in enjoyable easy safe way. It can be used by the teacher and the students in many events because of its easiness. They can move through it, make use of the various services provided as giving duties, follow-up, upload files work put Alerts polls and put links to sites and topics. we should use it, and take advantage of it.



Figure¹²: contains many activities done through lecture like pictures and videos.

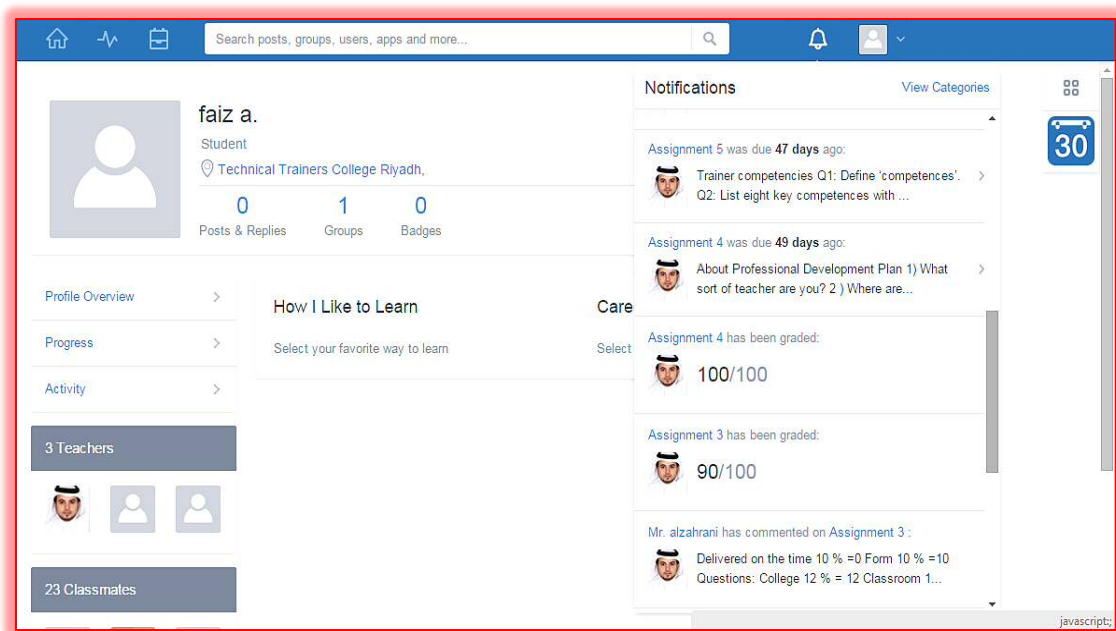


Figure:¹³ contains task's degrees and include also online discussion with teacher.

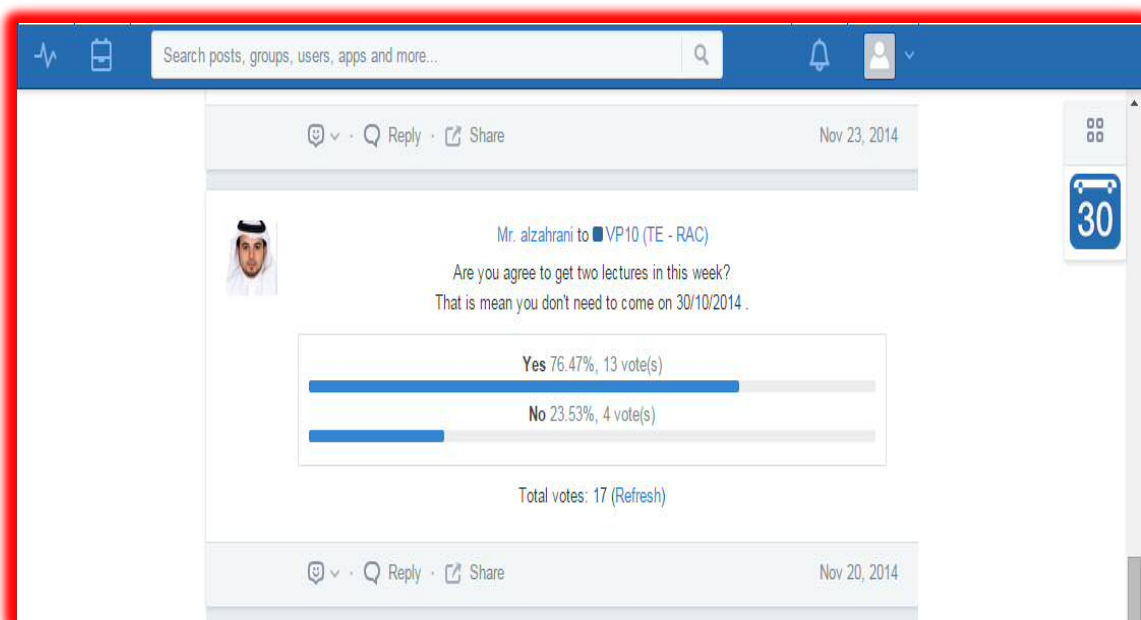


Figure:¹⁴ contains polls about to merging two lectures.

5.5.2 Features of Edmodo:

1. Teacher can control in managing students.
2. Adding topics, questionnaire, explaining, and results of the tests in websites
3. Adding evaluation for students by badges, you can design badges that you need it or using what is found in location.
4. There are electronic store for the website which include many applications in different fields that will help teachers and students.
5. Making comprehensive reports for the progress level and their participation.

5.6 Test the effectiveness:

This small questionnaire to test effectiveness of the Edmodo, number of participants in the questionnaire is 76 persons.

My Dear this survey has been done in order to help teachers what is the best way to teach their students. So please help us to find that.

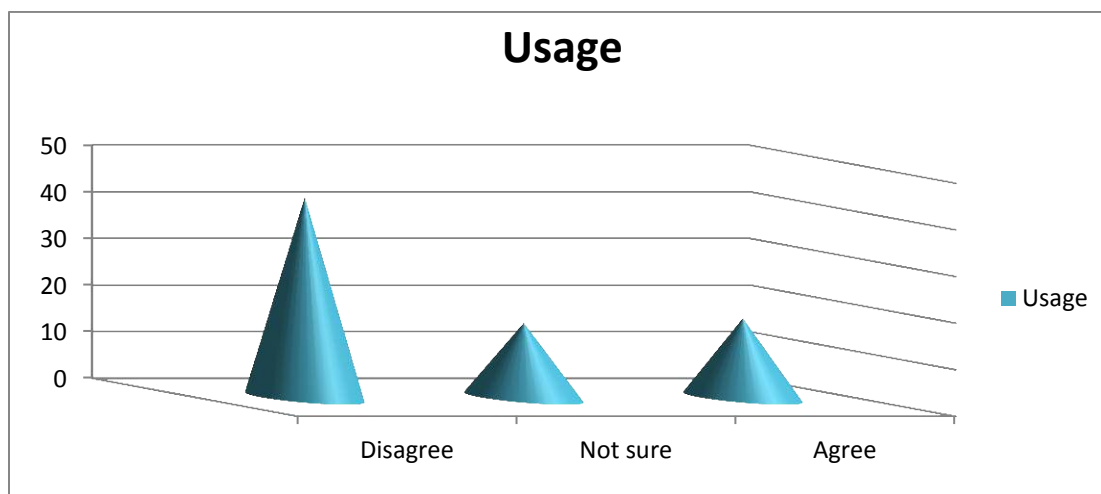
1- Did you use Edmodo in education previously?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on usage is high compared to disagree or not sure.

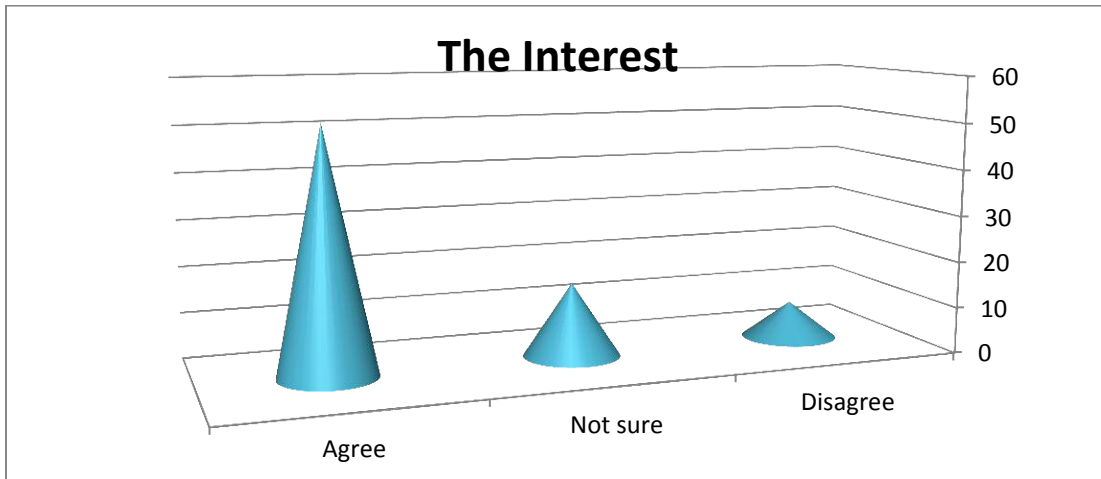
2- Was it benefit for you?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on interest is high compared to disagree or not sure.

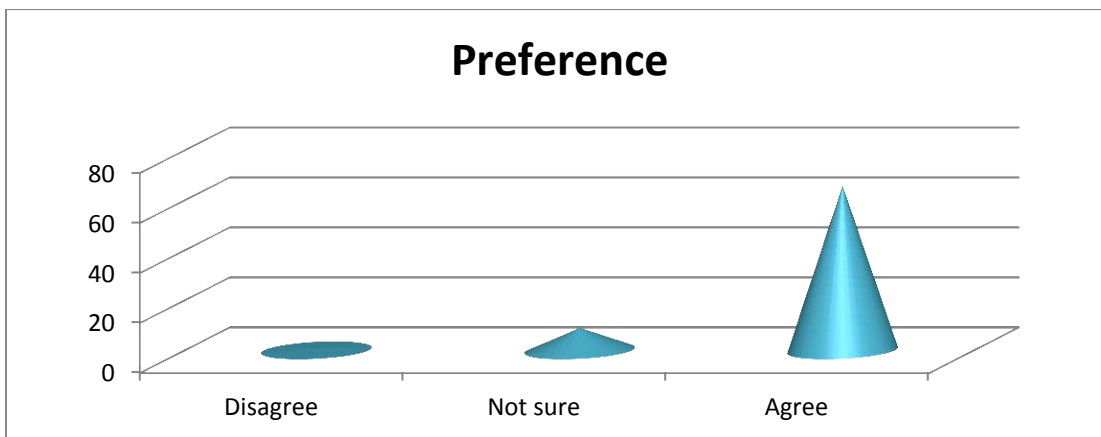
3- Do you prefer use it another time?

☐ Agree

☐ Not sure

☐ Disagree

The result :



- ❖ The proportion of those who voted agree on preference is high compared to disagree or not sure.

4- **In your opinion, what are the main reasons that make Edmodo useful for you as a student?**

Summary of the answers of this question was about : enjoyment side that was provided by website which depend on social communication side. Easiness of revising lessons frequently, especially for students who were not interacting during lessons in the classroom for any reason.

Some mentioned that learning was with them at everywhere through mobile phones or tablet. It became more interesting to them as well. They communicated and interacted with their teacher deeper.

Others said that they had returned to the website more than once after the end of the course material. It was an unforgettable experience and they wished to repeat it with every material.

5.6.1 The Conclusion of the survey :

After the analysis of students' answers to the survey we conclude the following:

It is clear from their answers to question No. 1 that the interactive media that used in the field of vocational education is little.

Many students agreed that they got benefits from using interactive media in the process of education. In addition to asking to use this method in all subjects, they have praised all aspects of social communication (with each other) or with their teacher.

They mentioned that the classroom moved with them on their mobile phones. The learning process became more fun and different. It also stimulated them to a great extent.

Hint: use of interactive multimedia in education is a genius step because it provides students the excitement and motivation. In addition, they learn in easy and fun way . It also reduces stress , and takes into account the social and educational differences between students.

6. Conclusion:

At the end, I hope that I succeed in achieving the aims of this research, that was clarifying the importance and the impact of changing teaching methods used in the field of vocational pedagogy. This research has touched the modern and traditional education approaches with overview of important advantages and disadvantages of each approach. This research confirms the importance and the impact of changing.

Then it looks at teaching methods and why the teacher should change the teaching methods he uses. Educational process should be based on the integration of each five senses, and using discovery learning and learning by peers and their characteristics .

There is also a brief glance of some teaching methods. The research has focused on only two of them in detail : (are simulation and interactive media). What they are , why they are important in the field of vocational pedagogy, their types, advantages and disadvantages of each one of them.

This research also includes examples of the use of simulation and interactive media, as well as a test of the effectiveness of these methods by surveys. I've added hints at the end of each chapter summarizes essential points. I also ended this research with some recommendations that are helpful to junior teachers. That's all. I want to thank you my dear reader, and I hope that you find useful things in this research.

7. Recommendations:

The following points include recommendations that have been deduced from the most important points of this research . Starting with the traditional and modern approaches, passing with the necessity to change teaching methods, and ending with teaching methods that have been explained in detail (simulation and interactive media).

- ✓ A good teacher should Integrate between modern and traditional approaches to raise the quality of the educational process.
- ✓ A good teacher can change his methods that he uses constantly like :
 - Develop a plan for each lesson includes learning by excitability of the five senses.
 - He can to uses the discovery learning by peers or learning by fun .
 - He can integrates more style to ensure understanding of information and Interest to the largest segment of his students.
- ✓ use simulation:
 - To provide students perfect experience similar to reality.
 - To increase the student's motivation to learn.
 - To give students some activity during the lesson.
 - To motivate students to creative thinking.
 - To make the lesson easier and more clarity.
- ✓ use interactive multimedia:
 - To present the lesson in interesting and enjoyable way.
 - To connect with students outside the classroom.
 - To save all classroom activities in order to the student return to them when he need.
 - To provoke all sense of the students.