INSTRUCTIONAL TECHNOLOGY

Curriculum and instruction department

Teaching Math Science Program

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CHAPTER 1

EDUCATIONAL TECHNOLOGY

Educational Technology

What is the Educational Technology?

Educational technology is a systematic and organized process of applying modern technology to improve the quality of education (efficiency, optimal, true, etc.). It is a systematic way of conceptualizing the execution and evaluation of the educational process, i. e. learning and teaching and help with the application of modern educational teaching techniques. It includes instructional materials, methods and organization of work and relationships, i.e. the behavior of all participants in the educational process. The term "teaching resources" is commonly used, although they are not synonymous (Pedagoški lek-sikon, 1996). The word technology is derived from the Greek word "techno" which means the willingness, skills, knowledge of the way, rule, skill, tools and "logos" which means science, word, learning, mental state. There is no single term for educational technology. Different countries use different terms and synonyms as educational technology, educational equipment, AV resources, the technology of teaching... Terminological differences mostly occur on the grounds of the approach to the technical characteristics and the use of modern appliances, and not their actual application in teaching i.e. their actual pedagogical application. For this reason, there are different opinions among teachers in the field of social and technical sciences. Therefore, the application of educational technology requires knowledge from several areas: pedagogy, psychology, didactics, computer sciences, informatics... Because of this diversity, there are also different perceptions of educational technology, where every author defines the concept of educational technology, according to their needs.

Educational technology is still not being applied sufficiently, mostly for reasons of lack of school equipment necessary resources and insufficient qualification of teachers for the implementation of these funds. Educational technology has three domains of use:

- Technology as a tutor (computer gives instructions and guides the user),
- Technology as a teaching tool and
- Technology as a learning tool.

Depending on the use and benefits, the research by Lowther et al., (2012) suggests that education technology has not yet taken its place, in spite of their recommendations. This is probably the reason for the statute of the social company. Leu et al., (2009) state that children in poorer areas very rarely use the Internet as a learning tool. Today's children use modern technical equipment from an early age (Gutnik et al., 2011; Rideout 2011) so that their coming in with new educational technologies at school will not be a problem.

In studies (Greenhow et al., 2009), we can find out that more students use modern technical equipment. Serious research on the in-fluence of education technology on cognitive processes was conducted by Kaufman, 2004; Lee et al., (2008).When using educational technology we should be primarily focused on the educational value of the tools and applications we use, how adequate they are in the acquisition of knowledge, whether there is an interaction between users and tools, and if we have positive effects in using them. A number of authors (Clements and Sarama, 2003; Glaubke 2007; Dynarski et al. 2007) suggest that we should focus on five areas of software programs that have the potential to strongly influence children's learning experience:

1. The educational value of the program,
2. Its ability to engage children in learning,
3. Ease of use,
4. Interactivity between the child and programs,
5. The possibility that a software program monitors the progress of the child.

Significances of Educational Technology

Educational technology analysis forever had degree formidable agenda. Typically it solely aims at hyperbolic efficiency or effectiveness of current practice, but usually it aims at education modification. Whereas it's going to be thought-about as a method science it together addresses basic problems with learning, teaching and social system so makes use of the entire vary of recent science and life sciences methodology. We sleep in a very dynamic world capsulated by just about endless amounts of knowledge. Riding the coattails of data is all of the technology we have at our fingertips. For as prevailing as technology is presently, is it commutation real lasting education? Can technology have a neighborhood in our classrooms? I think any level-headed skilled would agree that kids ought to be able to use technology to be competitive inside the geographical point once graduation. With all the trends and advancements in technology no one can argue that we'll go backwards from here. I don't foresee technology commutation impassioned lecturers educating their students. I just see it as a significant tool to help the education methodology and prepare students for the long-term. From the studies I've scan, lecturers got to use plenty of technology inside the space. the kids seem to basically get pleasure from it and area unit excited concerning exploitation it. Those interested by grip technology ought to be compelled to coach themselves on what's out there. Here could also be a small sliver of the advantages we tend to tend to achieve from exploitation technology to show people.

Equality: School districts across the country are not created equal. There is so much disparity in educational resources depending on the wealth, or lack thereof, depending on certain areas. Students using technology in low income districts gain significant skills and advantages in the learning process. Using the same technology is an equalizer for disadvantaged students.

Future: The world is moving towards technology at a breakneck pace. Educators have a responsibility to introduce, encourage, and help students master technology, as well as subjects, as it applies to school and the future. Technology will be used in every aspect of the professional lives of current students. So upon graduation, whether the next step is college or career, technology will be used daily. Why not use it daily in school?

Mobile: Using technology the classroom can be taken anywhere. With all the knowledge and resources contained and deliverable on demand in a mobile device, students can learn at home or in the "field".

Mobile technology allows for greater collaboration between students promoting strong foundations in group work.

Motivation: Technology tracks and reports student's progress instantly. What fun is running a marathon if you don't know how long it takes. Runners can get instant feedback for hundreds of data points as to their condition. This feedback provides instant motivation to improve performance.

Similarly students who use technology are motivated to improve performance. Just like they do at home on their gaming consoles. Trying to beat high scores at home and trying to beat high scores in math use the same psychology.

Social: This runs along the same lines as motivation. Creating a social element to educational technology can allow for healthy competition amongst peers both in the same classroom and across the country. Performing well and earning badges to gain virtual social status is of the heart of many social applications today. Personal identities do not have to be used, instead students could use avatars to hide possible confidentiality breaches. Using technology to make education have social elements can make learning very addictive .

Savings: The savings which result from using technology can come in many facets. On a basic level technology can replace infrastructure. Desks, books, lab equipment and other items are a heavy cost burden on schools everywhere. Technology and devices can help save on these costs. In addition geographically isolated or economically disadvantaged children can benefit from access to online software or resources which would be cost prohibitive without technology.

Updates: I recently read an article that reported students using 10 year old textbook in school. Updating textbooks can cost lots of money and do significant damage to budgets. On the other hand, updating software and educational content is not as expensive or cumbersome. With the help of technology course curriculum can reflect real world data. In some applications students can be exposed to real-time information.

Assessments: Assessing students performance can be done instantly with technology. It's more than just test scores, simply understanding students grasp of the subject in real time can be done on tablets in classrooms. A classroom

could be questioned with a multiple-choice problem. Students could then input their answer and the feedback score is instantly given to the student and teacher. Corrections can be made long before examinations.

Global: Students and classrooms or even schools can be connected to anyone in the world instantly. Devices coupled with the Internet can allow for a free way to communicate globally. The chance to understand international or different cultural perspectives on the same topic is incredible.

Convenience: Having children carry heavy backpacks, text books, and binders isn't very efficient. A new lightweight laptop weighs less than 5 pounds and can have an internal storage capability of more than 2 million illustrated pages. In addition to an internal hard drive, access to the Internet can provide an almost unlimited source of information. Ergonomic issues and back pain are a real problem in children. These conditions can lead to chronic problems throughout adulthood.

Education coupled with technology is overall a very positive thing. It's still in relative infancy and progress will continue to move forward making better systems. Teachers will still retain control over learning.

The school of 10 years ago looks very different from schools today. Also, students are being inundated with technology at a very young age. The transition has already begun. Education of the future will be delivered with current information delivered through traditional teaching methods and fantastic technological tools.

Earlier, technology in education was a debatable topic amongst the society. Everyone had their own views on modernizing education and making it technology aided. There were a huge number of positives and negatives to education technology. But, gradually as technology was embraced by the educational institutes, they realized the importance of technology in education. Its positives outnumbered the negatives and now, with technology, education has taken a whole new meaning that it leaves us with no doubt that our educational system has been transformed owing to the ever-advancing technology. Technology and education are a great combination if used together with a right reason and vision.

To elucidate on this topic , I am more than definite that technology improves education to a great extent and it has now become a need for revolutionizing education for the better.

With technology, educators, students and parents have a variety of learning tools at their fingertips. Here are some of the ways in which technology improves education over time:

• **Teachers can collaborate to share their ideas and resources online:** They can communicate with others across the world in an instant, meet the shortcomings of their work, refine it and provide their students with the best. This approach definitely enhances the practice of teaching.

• **Students can develop valuable research skills at a young age**: Technology gives students immediate access to an abundance of quality information which leads to learning at much quicker rates than before.

• **Students and teachers have access to an expanse of material:** There are plenty of resourceful, credible websites available on the Internet that both teachers and students can utilize. The Internet also provides a variety of knowledge and doesn't limit students to one person's opinion.

• **Online learning is now an equally credible option:** Face-to-face interaction is huge, especially in the younger years, but some students work better when they can go at their own pace. Online education is now accredited and has changed the way we view education.

There are innumerous instances till date where we can see the improvement in education, once it embraced technology. I will state a few remarkable ones of them to provide you with a more realistic picture of the whole scenario. Here's the list along with the references to the originals:

• **The Flipped Classroom:** This popular technological approach has gotten to everybody's ears by now. It is a practice in which, students watch lecture videos as homework and discussion is carried on them in the class-time by the teachers. It has resulted in a remarkably better student performance, with noticeable grade boost-up. Students can now learn at their own pace and save class-time for interaction. To go into more details about this approach refer to this article on The Flipped Classroom .

• **Effectiveness of EdTech on Mathematics for K-12:** Technology has proved to be effective for making students efficiently adept with Math. Out of several, there are three remarkable technologies, which in my opinion should be brought to the light. Computer-managed learning is a program that uses computers to assess student learning on Math and assign them with appropriate Math material, which they can work on to score and receive a chart of their progress for self-assessment; Comprehensive models such as Cognitive Tutor and I Can Learn use computer-aided instruction as well as non-computer activities for students to pproach Math; Supplemental CAI technology consists of individualized computer-assisted instruction (CAI), to provide additional instruction at students' assessed levels. Findings indicate that educational technology applications produce a positive effect on Mathematics achievement.

• **Long-term research indicative of the positives of technology on learning:** Researches have been performed to address to the question, does the use of computer technology affect student achievement in traditional classrooms as compared to classrooms that do not use technology? An extensive literature search and a systematic review process were employed and insights about the state of the field, implications for technology use, and prospects for future were discussed. Refer to the original review, Review of Educational Research .

• **Educational Technology improves student learning outcomes:** Evidence suggests that educational technologies can improve student achievement, so long as such tools are integrated thoughtfully into teaching and learning. When digital capabilities like, online environments are incorporated meaningfully into instruction, students have new opportunities to learn and achieve. Refer to this research brief for details.

• **The effect of technology on education depends on the design of instruction:** The design of the instruction accounts for more variance in how and why people learn than the technology used to deliver the instruction. Educators and educational researchers should be encouraged to focus on determining how to better integrate the use of a given technology to facilitate learning, rather than asking if it works or if one is more effective than another. Refer to this report for a detailed study.

Over the past years, a number of studies have shown benefits from the use of technology in education. The role is vital, and the question is no longer if technology enhances learning, but rather how do we improve our use of technology to enhance learning?

examples of the educational technology

1. Digital readers and tablets

Increasingly, schools are looking to replace the bulkier hard-copy textbooks with digital ones that are accessible via a tablet.

Pros

- They eliminate the need for students to carry around a heavy backpack full of books.
- They provide a centralized, accessible place for all reading materials.
- The regular updates of digital content eliminates the cost of purchasing new textbook editions every few years.
- Apps added to tablets can meet the educational needs of the students and provide for more personalized learning opportunities.

Cons

- to fully implement, schools would need to provide a tablet to every student and have a system in place for dealing with lost, damaged, or stolen assets. (However, more cost effective alternative.)

2. 3D printing

3D printing has already seen an impressive application in the world at large. According to Forbes, 3D printers have been able to create anything from car parts to artificial organs. In the classroom setting, 3D printing can create hands-on models that students can investigate and interact with. For example, students could learn about the geography of an area by observing a 3D map of it.

Pros

- 3D printing reaches both visual and kinesthetic learners.
- It engages the students and gets them curious.
- It reduces the time teachers need to spend on creating their own models (e.g., for a science class).

Cons

- Barely any. One might argue that 3D printing technology means students won't get to create their own physical models, but there's nothing suggesting that the two can't coexist.

3. Virtual reality

Technology for virtual reality, augmented reality, and mixed reality is rapidly developing. One of the primary uses for this technology in the classroom is to take students on virtual field trips to places otherwise inaccessible. For example, a student could take a virtual field trip to ancient Egypt or to the bottom of the ocean. One provider of this technology is Nearpod VR.

Pros

- It provides engaging, real-life experiences that would otherwise be harmful or inaccessible.
- Appeals to visual learners who like to see and experience things instead of merely reading about them.

Cons

- Students using virtual reality may develop a lack of spatial awareness in the real world. In other words, they could hit or run into something in the real world while immersed in the virtual one.
- Motion sickness can develop in some students due to their eyes sensing movement while their body does not.

4. Gamification

Students learn better when they're having fun. The use of gaming in the classroom applies this concept by tying together the fun part of play with the content and concepts that students must learn.

Pros

- It increases student engagement.
- It creates enthusiasm for the lesson.
- It provides immediate feedback.

Cons

- Not every fun game is effective at teaching a given concept. Not every game that is effective at teaching the concept is fun, either.
- It takes time and training to learn how to effectively use games for learning. However, platforms like Classcraft use gaming technology and offer training for those who want to learn how to better implement it in their classrooms.

5. Cloud technology

The cloud hosts apps and services on the internet instead of being on a user's computer. It enables information to be stored, shared, and accessed on any device that's connected to the internet. In education, the cloud is used to store and share digital textbooks, lesson plans, videos, and assignments. It's also used to give students the opportunity to chat live with their instructors and other classmates. In a related vein, cloud technology is enabling a new educational model known as 'flipped classrooms' in which students can watch a lecture before class and spend the class time engaged in discussion, group work, and analytical activities.

Pros

- It reduces the chances of homework getting lost between school and home.
- It reduces the need for students to carry heavy textbooks.
- It enables students to easily access information from any device connected to the internet.
- It enables quick and easy access to the teacher through live chat options.

Cons

- To fully adopt the cloud, schools would need to somehow ensure that every student has adequate access to the internet.
- Security. Although pretty much every network on the cloud has a security system in place to protect its information, hacking can be a concern.

6. Artificial intelligence

AI is making its way into the educational sphere by means of automating grading and feedback and providing personalized learning opportunities

Pros

- It can save the teacher time by doing the grading and giving feedback on their behalf.
- It provides greater insights into a student's learning patterns.

Cons

- Teachers can learn a lot about a student's learning patterns by doing the grading themselves.
- There's a personal element of care when a teacher gives personalized feedback (rather than letting a machine generate one).

7. Mobile technology

Rather than banning cell phones and other mobile devices from use during class, some schools are incorporating this technology into the learning process through educational apps.

Pros

- The wide variety of available apps offers the opportunity for students to engage in their own learning process.
- Educational apps provide the opportunity to personalize learning to each student.

Cons

- Not every student possesses a mobile device, and not every parent is comfortable with their child having one.
- To really utilize this technology, schools would need to make sure that every parent is onboard and that every student has access to some sort of mobile device.

Scope of Educational Technology

Educational generation is a process- oriented method. Educational era is not confined to teaching and studying manner and theories nonetheless teaching-getting to know method is inspired a whole lot more by using educational technology. Theories were shifted from getting to know to teaching simplest because of educational generation. If the academic technology is limited to audio-visible aids, mechanical and electronic devices the scope of educational era becomes constrained, but educational technology isn't always restricted to all this stuff alternatively, it pervades all over. Instructional era need to move into:

a. At home with family and relative

b. Help by External sources

c. Continuous and rigorous analysis

d. Obstacles in solving problems

e. Specification of direct behavior

f. Clear Specification of the problems

g. Management and organization of man, material, resources

h. Determination of pre-requisites and the gradual direct behaviour.

i. Availability of a few media as for example films, television, radio etc.

CONCLUSION

The presence of educational technology is growing in the classroom. The new generation of kids come ready to work with these new technologies, which play an important role in children's learning and acquiring various cognitive knowledge so that educational technology must be incorporated into future curricula. The application of educational technology enhances skills and cognitive characteristics. With the help of new technology comes an explosion of learning and receiving new information, especially on mobile devices. Teachers have been using new technologies in the classroom. However, the development and application of new technologies grows as a measure that is the question of whether teachers are trained to keep up with them. Here we have two problems. Are the teachers have the ability to use educational technology and whether the school is sufficiently equipped with all modern technical means? Numerous studies were carried out, some are still ongoing, but we have to find the right strategies to apply educational technology in teaching.

CHAPTER 2

VIRTUAL CLASSROOM

Virtual Classroom

The Virtual Classroom is an e-learning concept whose definition and prime objective is to enable the educators and the students to impart and perceive education online, respectively, principally over the Internet. Additionally, it allows them both to communicate, interact and, work together with one another remotely from any location, without actually being physically present face-to-face, via webinars, audio and video conferences, web presentations, live streaming, text chats, Learning Management System (LMS) and online training courses.

Much like the smart classroom, it is a notion fixated on teaching and learning the education with help of developing technology but begs to differ by mainly focusing on achieving the digital transformation in the classroom with help of the Internet. It provides an opportunity of distance education to the remote students by means of web-based online learning programs as well as the instructors with innovative teaching tools to teach virtually from anywhere at any time, irrespective of the geographical area, through online classes and courses.

Advantages of Virtual Classroom

- Personalized learning: Students can learn at their own time and phase
- Long distance learning
- Enhances collaboration and communication
- Real-time teaching and learning
- Effective and efficient time management
- Gives students and teacher a worldwide exposure
- Accessed to everyone equally from anywhere and at anytime

- Affordable
- Introduces students and educators to education technology
- Comprehensive online tutorials
- Encourages digital and smart classrooms
- Improves Visualization

Disadvantages of Virtual Classroom

- No control over the students or classroom
- No control over the learning atmosphere or environment
- Virtual Classroom requires computers and internet access, which might not be at hand to everyone
- Expensive: Enrolling into online live class or courses can be costly
- Students lack real-time teaching experience
- The risk to the traditional student-teacher collaboration

Examples of virtual classrooms

1.GOOGLE CLASSROOM

What is Google Classroom?

Google Classroom is a free web-based tool developed by Google. It was introduced on 12th August in the year of 2014.

It is mainly used by the teachers and students, for sharing the files between them. In the Google Classroom, teachers can create the assignments for the students, and can also collect the assignments from them. Both the teacher and student can work without the use of papers in this application.

The main objective of making a Google Classroom is to create, grade, and distribute the assignments in a paperless way. This web-based application also integrates with the other tools of Google like Google Drive and Google Docs.

Within this application, students and teachers can easily communicate with each other, and the faculty/teacher can also track the progress of each student.

This application uses Google Drive for creating and distributing the assignments, Google Docs for writing the sheets and slides, Google mail for the conversation or communication, and the Google calendar for scheduling.

Uses of Google Classroom

Following are the different uses of Google Classroom:

- This tool is used for sharing the assignments between the teachers and students.
- This service also helps the teachers by grading the assignments, which are done by the students.
- With the help of this tool, teachers can easily post an announcement which is important for the entire class. The announcement posted by the teachers is available to the student in the mail. Unlike the other websites, the students in this application can comment back on the announcements.
- Teachers can easily distribute, organize, and collect the assignments in a digital way. Teachers can also easily check who has completed the work or not at the given time.
- It allows teachers to attach one or more videos to an assignment or an announcement.
- The Google classroom allows each student to create the slides with their information. And, it also allows the other students to add the comments on the slides of other students.
- It is also used to organize or create an assignment with the due date.
- Students can also mail to the teachers by an icon which is given by the Google Classroom.
- This tool allows the students to access the assignments and the study materials which are provided by the teacher or the instructor. It can also provide a platform, which helps a student to communicate with the teacher and other students.

Features of Google Classroom

Following are the various features of the Google Classroom:

1. Assignments

2. Announcement

3. Communication

4. Google Calendar

5. Google Forms

6. Mobile Application

7. Privacy

Advantages of Google Classroom

Following are the various benefits or advantages of the Google Classroom:

1. This tool is easy to use and understand for both teachers and students.

2. The teachers can easily set up the class on this platform. After the setting up of a class, they can also invite the students, and other co-teachers.

3. This tool allows the teachers for tracking the progress of each student in the class.

4. Through this tool, teachers and students can also access to the other products of Google.

5. Google Classroom allows students to interact with the teachers and other students at any time and any place.

6. It is free of cost. The teachers and students can easily access it with the help of an internet connection. For accessing it, the teachers and students do not need any platform.

7. This tool is completely paperless; hence it reduces the paperwork for students and teachers.

8. The work done by the teacher and students in the Google Classroom is saved automatically in the Google Cloud, and it can be easily accessed from any device at any time.

9. The teachers and the students also use this tool on mobile devices. When any assignment or announcement is posted by the teachers in this tool, students receive the notification on their mobiles.

10. Teachers can also create a question for the students.

Sign in and Set up a Google Classroom

Sign-in is the first step for both teachers and students to enter in the Google Classroom. You can only use this service with an active internet connection. You can sign-in into the classroom with the following types of account:

1. School Account

2. Personal Google Account

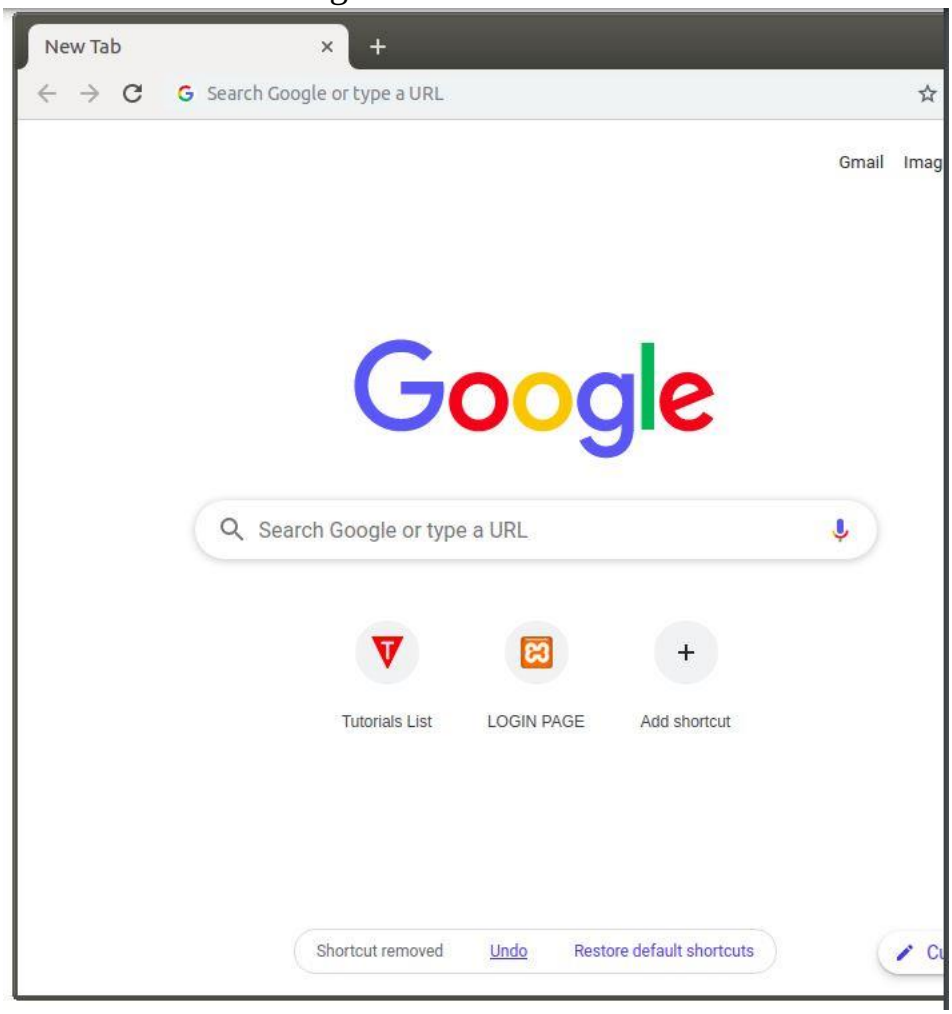
3. G Suite Account

Sign in the Google Classroom on a Computer system or Laptop

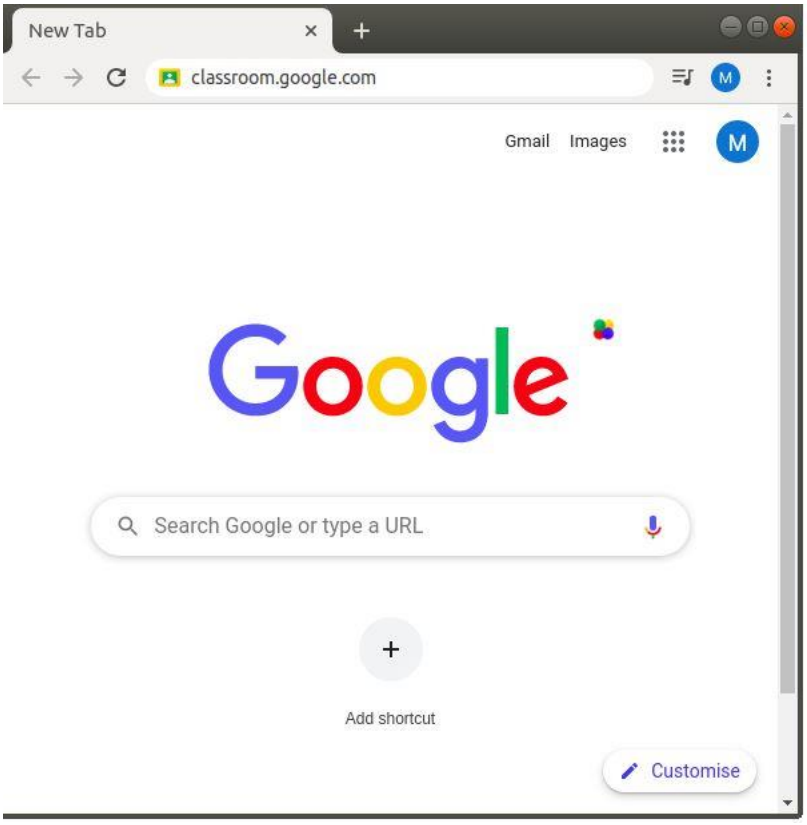
If you are either a teacher or a student, and you are using a laptop or PC, then you must have to follow the given steps to sign in:

Step 1: Firstly, you have to open any web browser by clicking on the browser icon in your system. We have opened the Google Chrome browser in our system as

shown in the following screenshot.

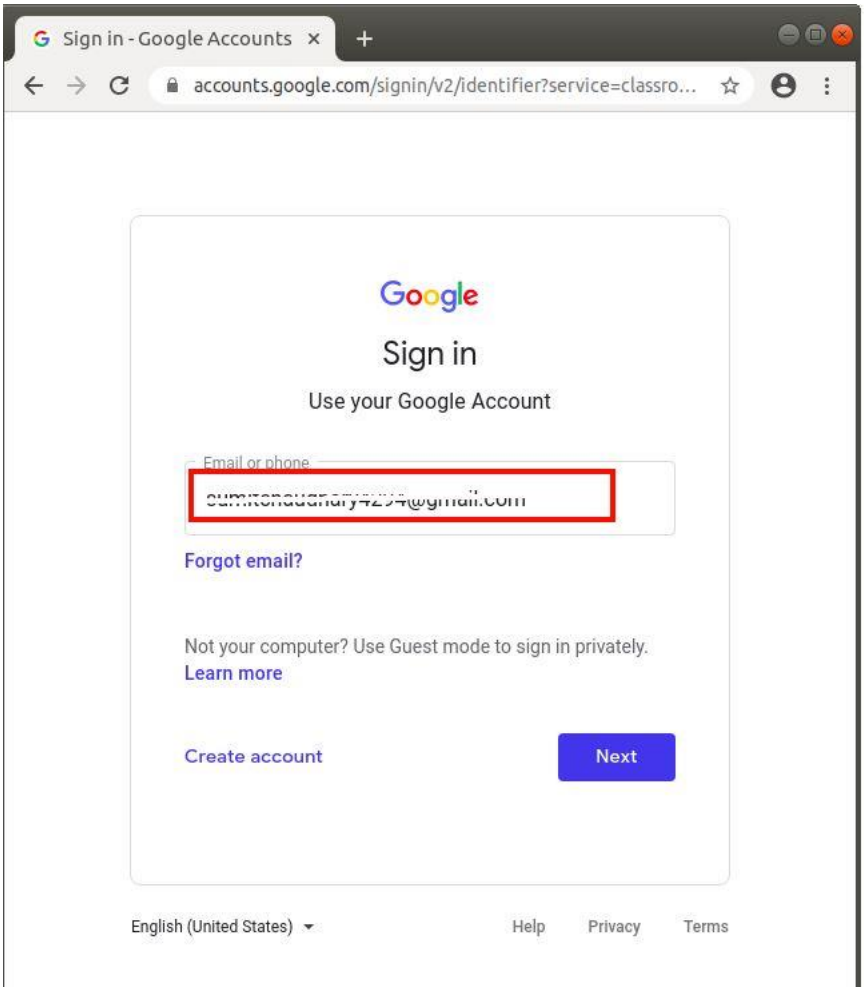


Step 2: Now, you have to type the Classroom.google.com URL in the address bar of the web browser as shown in the following screenshot. After typing the URL, press Enter.

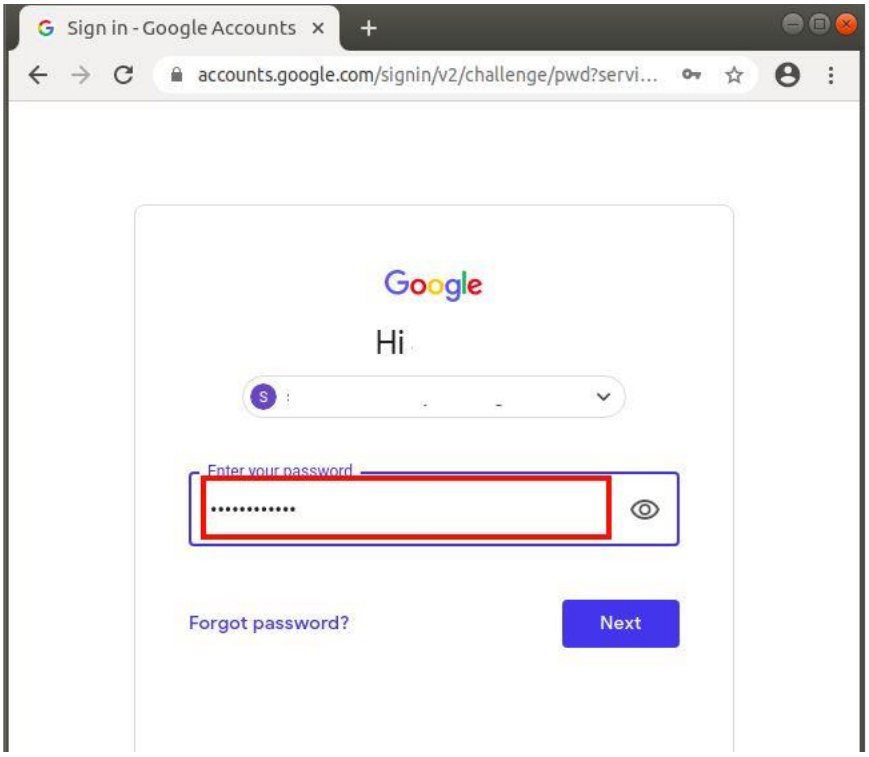


Step 3: Now, click on the Go to Classroom button.

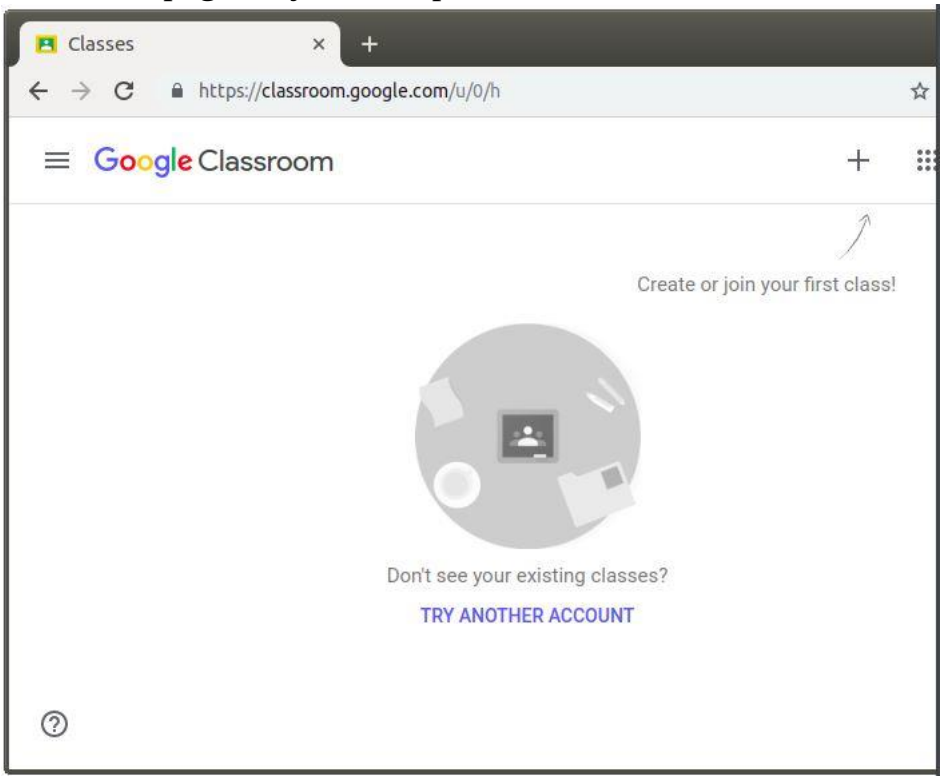
Step 4: Now, enter the email address of your Google account in the Email or Phone field and click on the Next button.


Sign in - Google Accounts
accounts.google.com/signin/v2/identifier?service=classro...
Google
Sign in
Use your Google Account
Email or phone
Forgot email?
Not your computer? Use Guest mode to sign in privately.
Learn more
Create account
Next
English (United States)
Help
Privacy
Terms

Step 5: Now, you have to enter the password of your Google account. And, again click on the Next button.



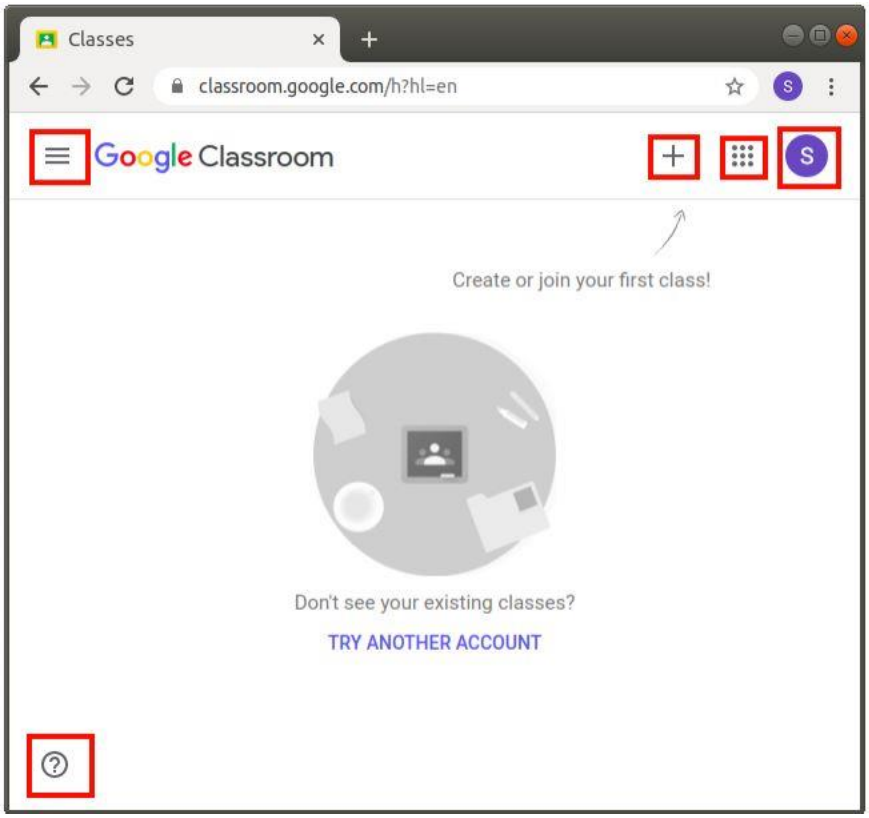
Step 6: After clicking, you are successfully logged in the Google Classroom. You can also see the same page on your computer's screen as shown in the following screenshot.



Explore the Home Screen of Google Classroom

The following screen is the home page of Google classroom, which consists of the following functions. This page is visible for both teacher and a student.

1. Classroom Menu
2. Create or Join a Class
3. Google Apps
4. Account Settings
5. Help and Feedback

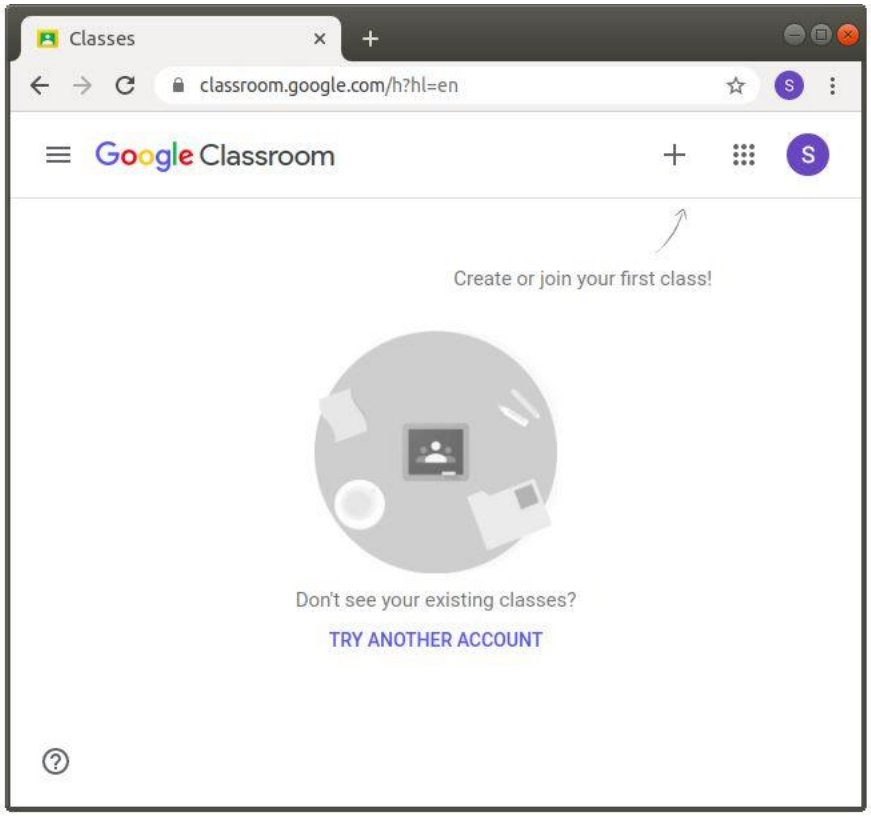


Create a Class

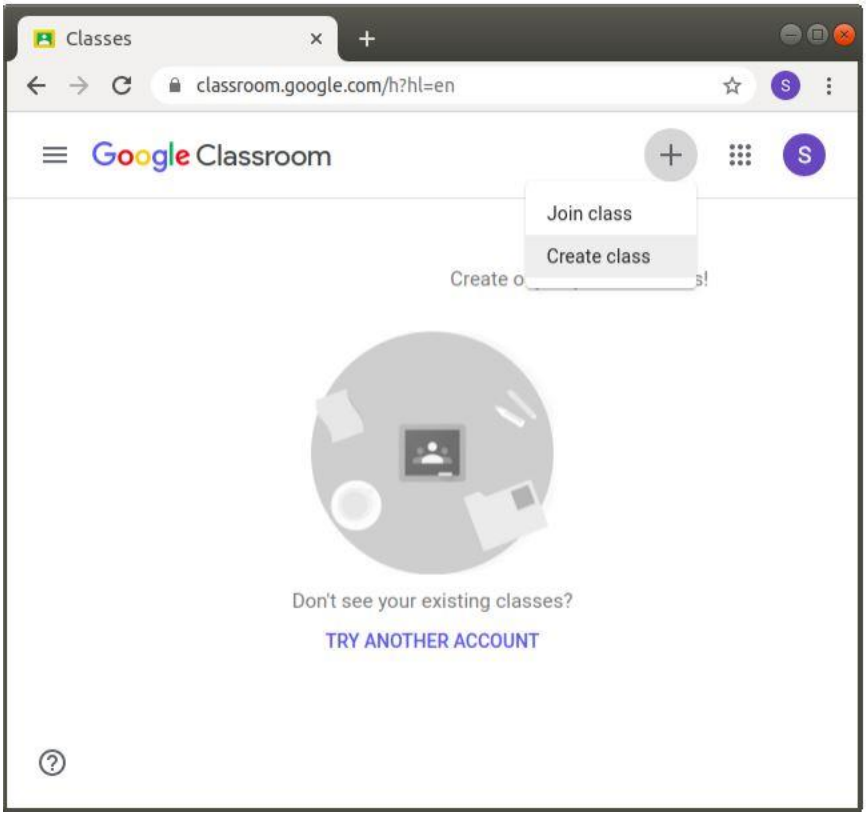
If you are a teacher, and you have to use a Google Classroom for sharing the assignments with your class students, then firstly you have to create a class after sign in the Google Classroom.

When you successfully sign-in the Google Classroom, then you have to follow the given steps to create a class:

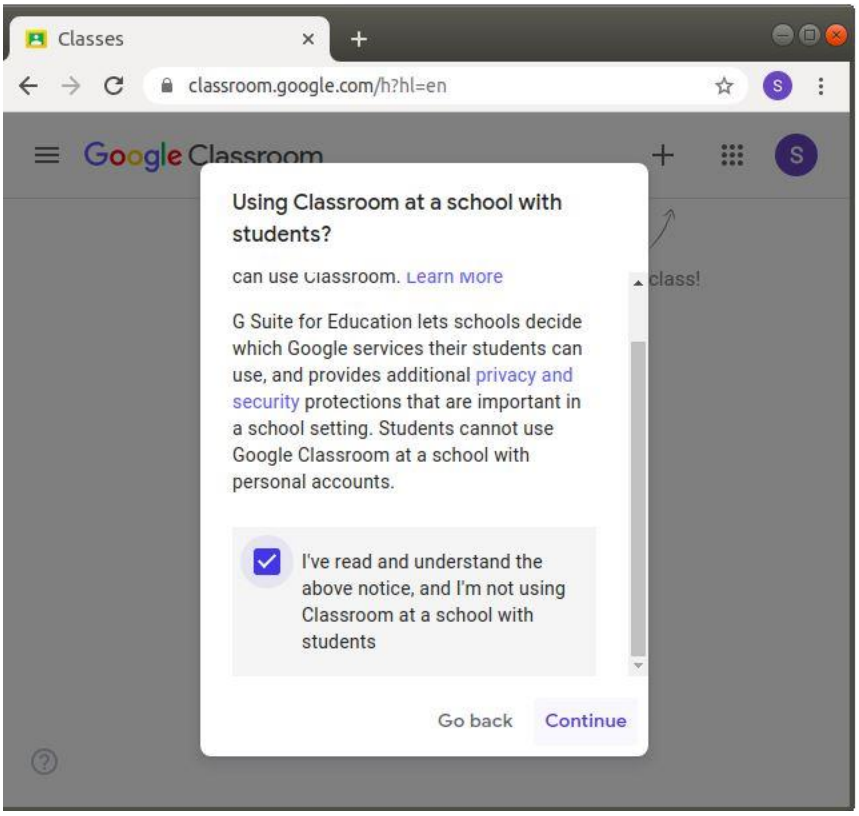
Step 1: Click the + (Add) button, which is located in top-right on the home page of the Google Classroom, as described in the following snapshot.



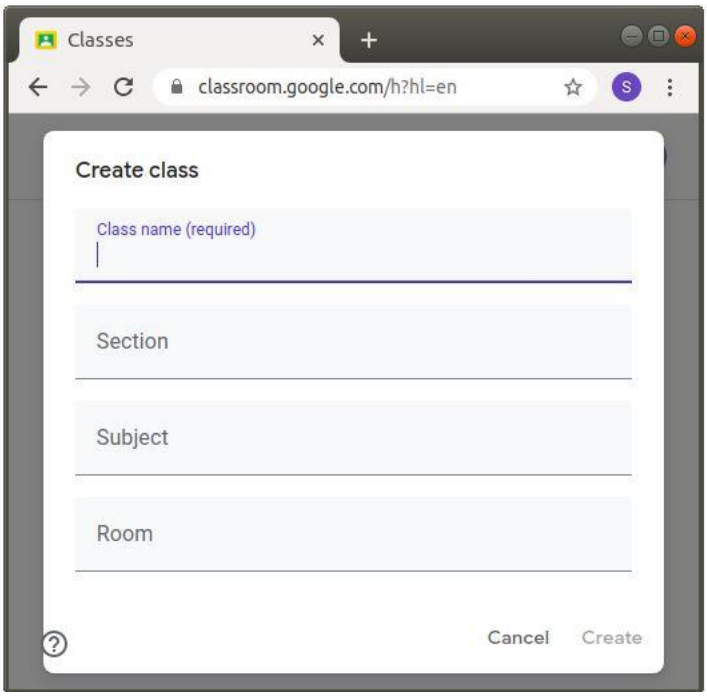
Step 2: Select and click the 'Create Class' button.



Step 3: Now, select the checkbox button, and click on the Continue button



Step 4: After clicking, you have to enter the four fields as shown in the following screenshot.



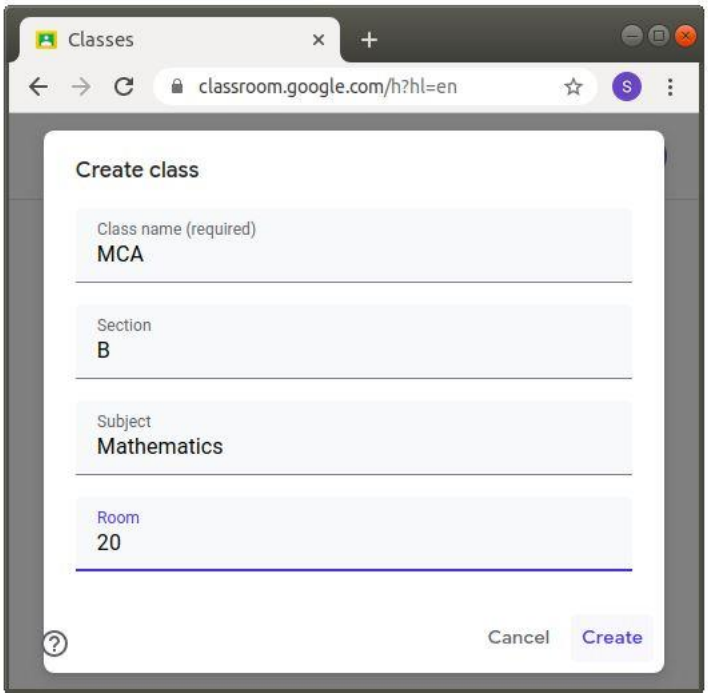
Step 5: We enter the class name. The Class name field is required. You have to give the name of the class which is meaningful to you and your class students

Step 6: After filling the class name, we fill the section. To fill the section field, click on the Section, and enter the details. This field is optional.

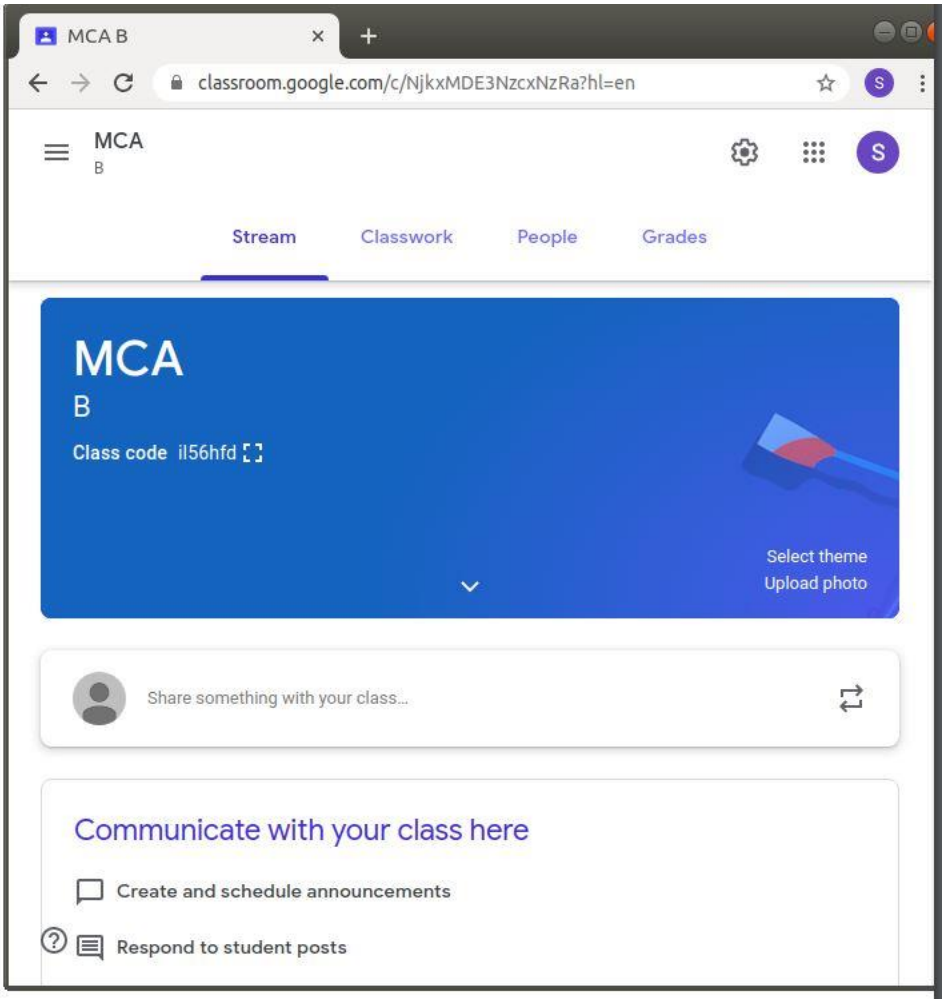
Step 7: Now, we fill the subject, by clicking on the Subject. This field is also optional, you may be or may not enter the value in this field.

Step 8: Now, we enter the number of room number in which the class students are taught. This field is also optional.

Step 9: And at last, click on the Create button.



After clicking, your class is created automatically by the Google Classroom, and you will see the same screen on your computer as shown in the following screenshot:



After the creation of a class, the code is automatically generated by the Google Classroom, which helps your students for joining a class. And, you can also easily invite the students of your class for sharing the announcements and assignments in the Google Classroom.

Join a Class

If you are a student, and you have to join the class which is created by your teacher. Firstly, you have to sign in the Google Classroom, by your active mail Id.

You can easily use the following two ways to join a class:

1. Join a Class with a class code.

2. Accept an invitation from your teacher.

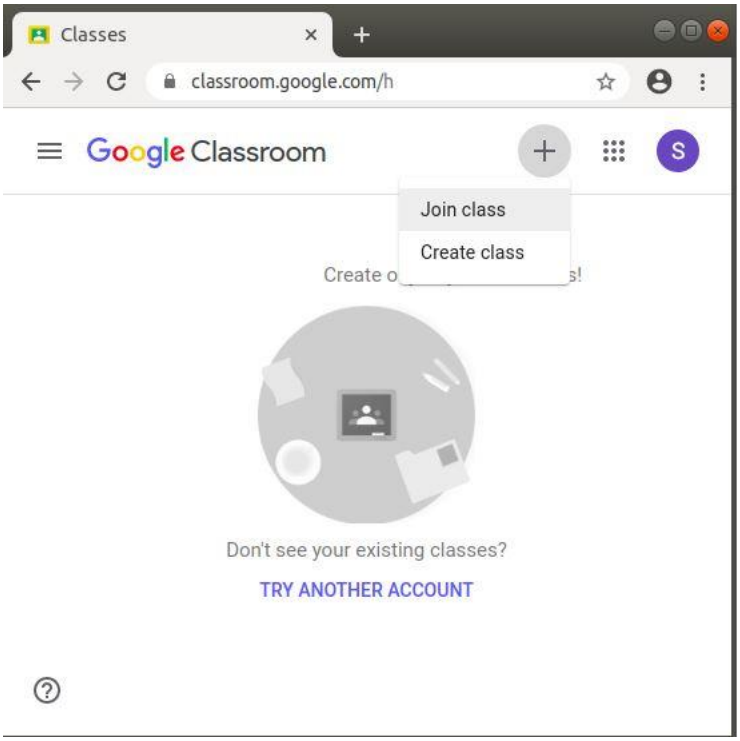
Join a Class with a Class code

The class code is a code which is automatically created by the Google classroom at the time when your teacher creates a class. Your teacher gives this code to you for joining a class.

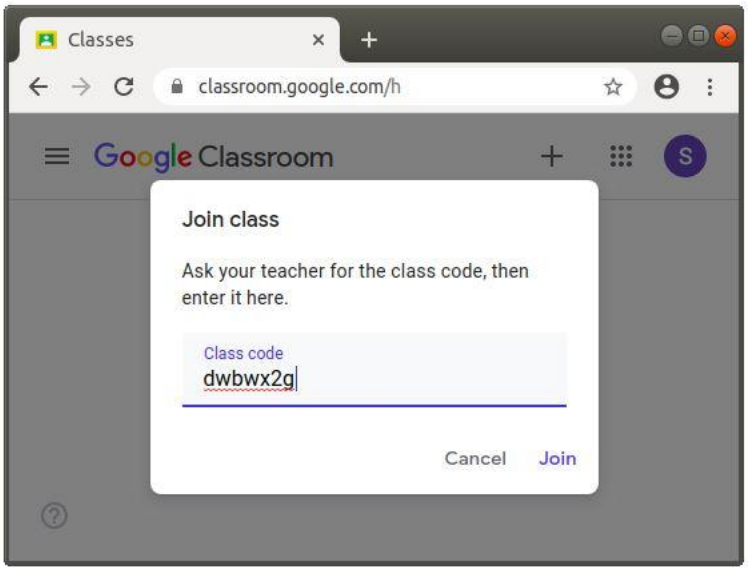
When you successfully sign-in the Google Classroom, then you have to follow the given steps to join a class with the help of given class code:

Step 1: Click the + (Add) button, which is located in top-right on the home page of the Google Classroom, as described in the following snapshot.

Step 2: Select and click the 'Join Class' button.



Step 3: Now, enter the Class code which is given by the teacher. And, then click the Join button.



Step 4: After clicking, you are successfully joined in the class, which is created by your teacher. And, you can receive the assignments and announcements. When you successfully joined in any class of google classroom on one device, then you are automatically enrolled in that class on all the devices, where google Classroom run.

Join a Class by accepting an invitation

You can also easily join the class by accepting an invitation which is sent by your teacher.

When you successfully sign-in the Google Classroom, then you have to follow the given steps to join a class by accepting the invitation:

Step 1: Open your Account on which your teacher sends an invitation.

Step 2: Click the mail and click on the Join button.

Step 3: After clicking, you are successfully joined in a class, whose invitation is sent by your teacher.

Post an Announcement

If you are a teacher and you want to post the announcements to the students in a class of Google Classroom, then you have to learn this section.

You can easily post an announcement with various following functions:

- Post the Announcement to one or more classes.
- Post the Announcement to an individual Student in one class
- Post the Announcement by adding the attachments.

To post an announcement to the students in a Google Classroom, follow the steps which are given below:

Step 1: Firstly, sign in the Google Classroom with your Google classroom id.

Step 2: Then, click on the Classes tab in the classroom menu, which is located at the top right corner in the Google Classroom screen.

Step 3: Now, click on that class in which you want to post the announcement to the students.

Step 4: Click Share something with your class on the stream's page.

Step 5: After that, type the announcement in the box, and then click on the Post button.

Step 6: After clicking, the announcement is posted.

Create an Assignment

If you are a teacher and you want to create the assignments for the students in a class of Google Classroom, then you have to learn this section.

You can easily create an assignment with various following functions after reading this section:

- Post an Assignment to one or more classes.
- Post an Assignment to an individual Student in one class
- Post an Assignment by adding a due date and time.
- Post an Assignment by adding the attachments.

To create an assignment in a google Classroom, follow the steps which are given below:

Step 1: Firstly, sign in the Google Classroom with your Google classroom id.

Step 2: Then, click on the Classes tab in the classroom menu, which is located at the top right corner in the Google Classroom screen.

Step 3: Now, click on that class in which you want to create the assignments or post the assignments to the students.

Step 4: After that, click on the Classwork tab, which is present next to the Stream tab at the top of the screen

Step 5: Now, click on the Create button, and then click on the Assignment option in the drop-down list.

Step 6: After clicking, we will move to the following screen, in which we have to enter the title of an assignment, by clicking on the Title. And, if you want to give the instructions on how to do the assignment, then enter the instructions by clicking on Instructions (optional).

Step 7: you can post an assignment to one or more classes.

Step 8: you can post the assignment to the individual students. (you can only post an assignment to less than 100 individual students in a class).

Step 9: you can post an assignment by adding a due date and time.

Step 10: you can add a topic to your assignment.

Step 11: you can add the attachments to your assignment.

Step 12: In this step, you have to click on the Create button. And, then choose the option according to your needs. When you created an assignment successfully, click on the Assign button, which is located at the top-right corner of the screen.

2.Edmodo

What is Edmodo?

Edmodo is a basic social networking website that contains several features similar Facebook: a scrollable “wall” or “timeline” to which you can view posts ordered by date, an individualized profile page, push notifications to show what is new, easy access to sharing links, and an ability to send messages to groups or individuals. The primary difference is that Edmodo was created with students and instructors mind by merging familiar social networking features with features typically associated with classroom management systems. As an instructor, you can create assignments, build quizzes, poll audiences, manage small groups, grade activities, and even award badges all within a 2 self-contained space that enables students and instructors to maintain a degree of separation between their academic and social worlds. With Edmodo, students and instructors can network in an environment that keeps the focus solely on teaching and learning without the risk of inadvertently glimpsing into each other’s private lives.

How can I get Edmodo for use in the classroom?

To create a free Edmodo network account, go to www.edmodo.com and click the “I’m a Teacher” button. After creating an account, you can create a profile, add a picture, create courses, manage notifications, and send group “add” codes so your students can join your course. (Student instructions for joining Edmodo are slightly different: After creating an account, they need only enter a group “add” code to

join the course. Instructors should encourage students to select how they want to send and receive e-mail and text messages as well as to upload a profile picture.) Though Edmodo has an initial learning curve in navigating the website, most of the features are fairly intuitive.

How can I use Edmodo in the classroom?

Edmodo has many useful features designed to complement different types of courses. In particular, it is especially advantageous for:

1. information sharing. Edmodo enables students to easily communicate with their classmates and instructors. When communicating with classmates, Edmodo allows students to ask each other questions as well as view and respond to each other's questions; they also can share and view information. In my experience, students are quick to respond to one another, which reduces the amount of e-mail messages and saves valuable time. For more difficult questions, instructors can choose to respond directly on Edmodo, which allows all students to view and benefit from these messages. This information sharing ability is also useful for courses in which students need to share links with one another: for example, students enrolled in a research methods course may share survey links from Google Forms or students taking a public speaking course may share links to video presentations hosted on YouTube.
2. group work. Edmodo allows for the easy creation of small student work groups. Each group has the ability to create a team name and work within an individualized space where they can share ideas, articles, news, and resources with each other. This feature is especially relevant in courses with group projects such as a research methods course in which students may need to share empirical articles, post measures, talk about stimuli, or coordinate group face-to-face meetings.
3. mobile notifications. When creating their accounts, students have the ability to select whether they want to send or receive mobile notifications from their instructors in the form of either an e-mail message or a text message. For example, instructors can use this feature in the case of having to cancel class; students can use this

feature to notify an instructor that they are running late for an office visit.

4. assignments and grading. Adding assignments on Edmodo is simple. Although these assignments appear similar to a typical post on a social networking site, the post also includes an area for students to upload any assignment materials. Grading can be handled directly on Edmodo through an easy-to-complete touchscreen device, and students can view their grades immediately on the site. In this instance, Edmodo can be used in lieu of a classroom management system and enables students to manage their classroom information on one site instead of two sites.
5. control and visibility. Instructors can maintain a degree of supervision and management by maintaining access of conversations on the website. You can determine if your students are sharing information, if they are uploading materials to share with one another, and if they are responding to each other's posts. Similarly, you can delete inappropriate posts as needed and monitor website in the event that issues arise.

CHAPTER 3

TEACHING WITH GAMIFICATION

GAMIFICATION

Gamification is one of the most popular and preferred trends of learning amongst students, globally. Games help in situated learning or, to put in simple words, learning that occurs through immersive experiences. After all, what else could be the best way to educate learners other than putting them to play.

Gamification refers to "the use of a pedagogical system that was developed within game design, but which is implemented within a non-game context" (Higher Education Academy). Gamification takes the mechanics of gaming, like points, levels, badges, or leaderboards, and applies them to the way a course or module is taught. Game-based learning and gamification are two terms that are sometimes used interchangeably, but actually refer to two distinct pedagogical methods. Game-based learning asks learners to play games designed to enhance their learning, rather than integrating the principles of game design into standard classroom instruction (Higher Education Academy). This Teaching Tips focuses primarily on gamification, but might also be of interest to anyone looking to introduce game-based learning into their teaching.

Benefits of Gamification

Experiments with gamification began with instructors looking to harness the power of games—that willingness of gamers to play for hours, to try at a task and fail and still try again, that sense of fun at accomplishing something difficult—and bring it into their teaching. Games, after all, are remarkably motivating and engaging, "they utilize a number of mechanisms to encourage people to engage with them, often without any reward, just for the joy of playing and the possibility to win." They "reinforce not only knowledge but also important skills such as problem-solving, collaboration, and communication" (Dicheva et al., 2015).

When we play games, we may even exhibit certain traits that we may not in educational contexts. A person playing a video game may try repeatedly for days to master the smallest task, 'dying' again and again until finally succeeding, and yet that very same person might feel completely discouraged and unmotivated after getting less than a perfect score on a quiz in class. In her talk on how "Gaming can make a better world," game designer Jane McGonigal describes positive

characteristics of gamers, including urgent optimism and blissful productivity. Urgent optimism is a form of extreme self-motivation. It "is the desire to act immediately to tackle an obstacle combined with the belief that we have a reasonable hope of success." Gamers are always looking for, and believing in, the possibility of an "epic win." Blissful productivity is exactly that level of engagement in a difficult and repetitive task that allows gamers to play for hours a day, every day.

Expanding upon McGonigal's concepts of urgent optimism and blissful productivity, JISC defines motivation, or "the choice of an individual to carry out some activity" and the "persistence, effort, or resources that the individual puts into carrying out the activity," as having three underlying components, all of which can be engaged by an effective game experience:

1. Autonomy: when you feel like you're in charge of something, you are more likely to stick with it

2. Value: when you think a goal is important or of value, you are more likely to complete it

3. Competence: "if you know that something takes hard work as opposed to some talent, you are more likely to keep attempting it," and the better you become at a task, the more likely you are to continue doing it (JISC).

Autonomy

Games and game-like elements can encourage autonomy and self-efficacy by providing student control over learning activities (Geelan, 2015). An effective game will encourage more than just passive engagement, it will instead allow players to actively engage with their experience—the choices they make matter and the way the game unfolds is dependent on their input (Langendahl et al., 2016).

Value

By showing a clear connection between the learning activities and their real life application, games and gamelike experiences will be seen as something of value. Players should feel that the game is relevant to their studies, engages their own

inherent interests, and helps them generate new knowledge that they can apply outside of the game environment (Geelan, 2015).

Competence

By setting up a scaffolded learning experience of progressive difficulty with feedback offered after each attempt, feelings of competence can be increased (Geelan, 2015). Bloom's Taxonomy can be used to design the progress through the game, defining the journey from lower to higher-level learning objectives (Langendahl et al., 2016). When students complete a task and move to the next level, they get a sense of their own development as learners.

A Framework for Gamification

The components that make up gamification can be divided into two categories. Dicheva et al. refer to these as game design principles and mechanics (2015). Langendahl refers to these same categories as underlying dynamics and surface elements, seen in Fig. 1 (Langendahl et al., 2016).

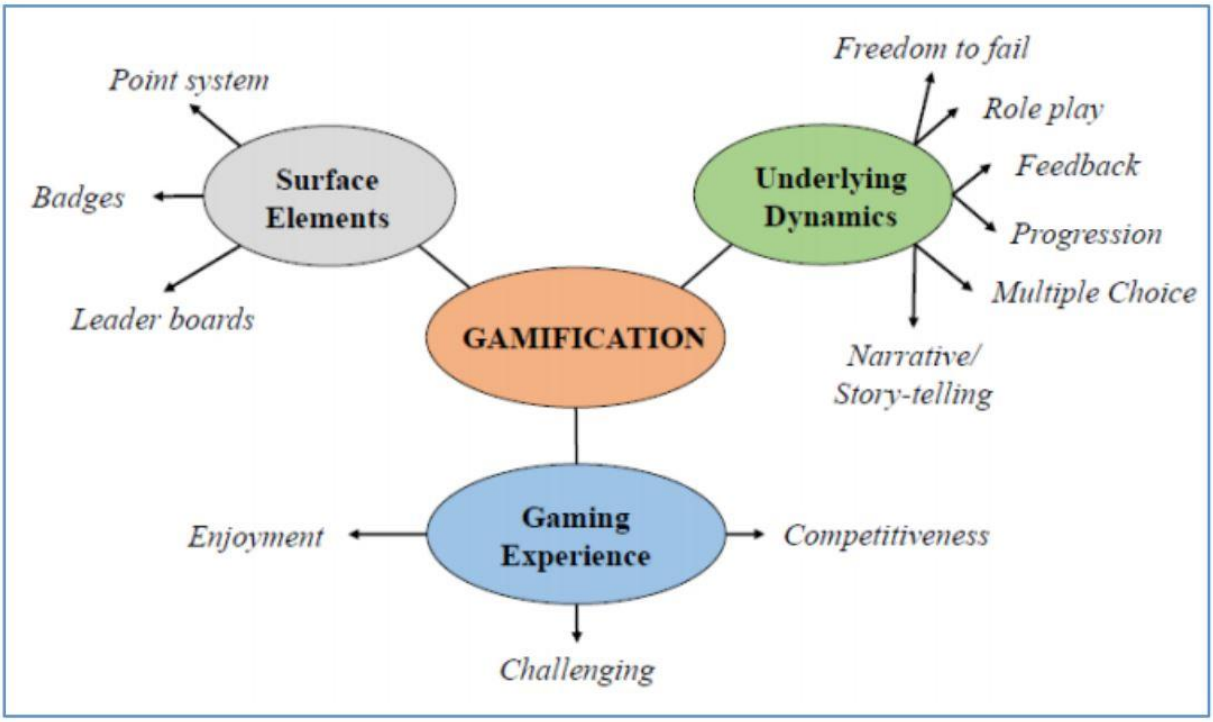


Figure 1: Gamification Framework: surface elements, underlying dynamics and game effects (Langendahl, 2016)

Game Design Principles/Underlying Dynamics

Game design principles—like goals or challenges, freedom to fail, narratives, or personalization—are the set of concepts that underpin specific game mechanics. Many of them are already in use in education, though to be successfully implemented as part of a gamified learning experience, they may need to be adapted. For example, all courses provide students with feedback, but in a gamified course, feedback "should be immediate or with shortened cycles" (Dicheva et al., 2015).

Dicheva et al. completed a literature review of research done on gamification and listed the game design principles that have been used in education, along with some tips for how to implement them effectively:

• **Goals** should be specific, clear, immediately visible and moderately difficult to achieve.

• **Challenges and quests** should be clear, concrete, actionable learning tasks with increasing complexity.

• **Customization** should give learners a personalized experiences, with adaptive difficulty, challenges tailored to player's skill level, or increasing difficulty with player's improvement

• **Progress:** learners should be able to visually assess their progress on their journey to mastery

• **Feedback:** learners should receive immediate feedback and immediate rewards

• **Social engagement** should be included in some form, whether through competition or collaboration

• **Accrual grading:** Rather than grades representing points being deducted from a perfect score (i.e. receiving 75 out of a 100), learners could instead start from a base level and build up the points that will form their grade.

• **Visible status:** learners should be able to earn a reputation, social credibility or receive recognition in some way

• **Access/unlocking content:** learners should be able to use their mastery of tasks or their accrual of points to access new features or unlock new content

• **Freedom of choice**: there should be multiple routes to success. Learners should be able to choose their own sub-goals within the larger task

• **Freedom to fail:** there should be low risk associated with certain submissions, learners should get multiple attempts to succeed

• **Storytelling**: narrative should be used to create that sense of "epic meaning" that encourages them to keep playing

• **New identities:** learners could play roles as part of a story, or build a new identity for themselves

• **Onboarding**: learners should be introduced to the mechanics of the game with initially easy tasks

• **Time restriction:** games should be rigorously scheduled – learners could have minutes to complete a quiz or days to complete a quest

Dicheva et al. then counted "the number of papers discussing each of the identified educational gamification design principles" and graphed them (Fig. 2). The most frequently utilized game design principles were visible status, social engagement, freedom of choice, freedom to fail, and rapid feedback:

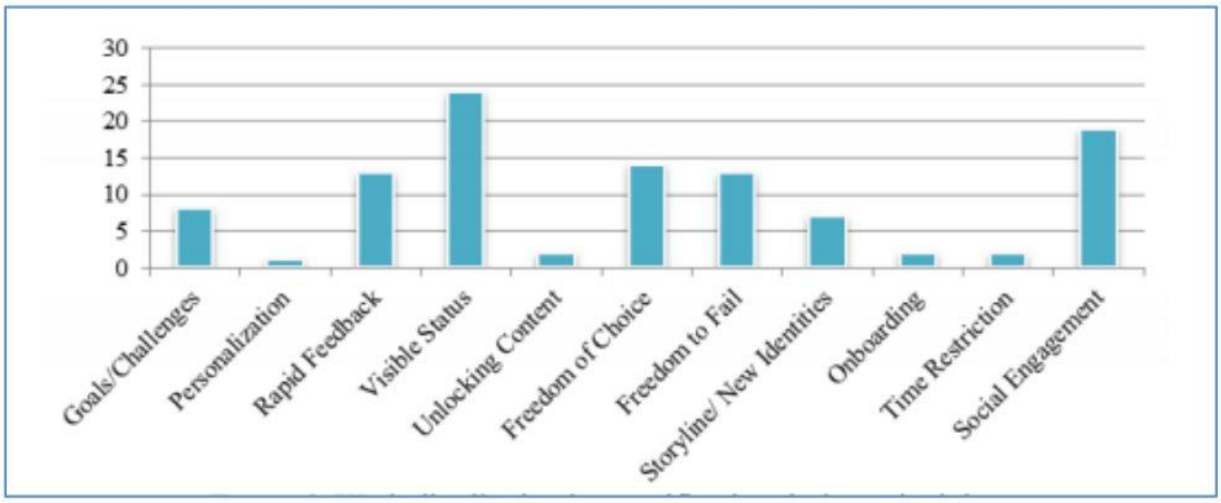


Figure 2: Distribution of gamification principles (Dicheva et al., 2015)

Of these principles, four have been found to be particularly effective in creating motivating and engaging learning environments:

1. Freedom to fail - in the same way that recreational video games will give players a certain number of tries or 'lives' to complete the game, or allow players to start again at their most recent level, learning games can remove the conventional focus on a final grade and the potential for 'failure,' and instead encourage students to experiment, to take risks, and to try again. Games can be a way to allow learnersto explore content, take chances, and be exposed to a range of different outcomes and realistic consequences for making a bad decision while still keeping the stakes low.

2. Rapid feedback - games typically provide frequent targeted feedback as the game is played, sometimes after the completion of an individual task, sometimes at the end of each level. The following section on game mechanics provides a short case study describing a type of rapid feedback in a gamified learning environment.

3. Progression - progression through increasingly complex environments can also be seen as the scaffolding of learning. When games are divided into levels, players have the opportunity to practice what they have learned in stages, often culminating in the requirement that they apply all those skills at once to complete a final level.

4. Storytelling - the most successful games usually involve a story. By structuring content inside a narrative, and asking players to participate in the creation of the story or to take on the identity of a character in the game, both engagement and recall are improved (Higher Education Academy; Stott & Neustaedter, 2013).

Game Mechanics/Surface Elements Game

mechanics are the tangible elements that reflect the underlying principles. Literature on gaming has "identified a diverse array of such elements," including replay, unlockable content, scoreboards, character upgrades, and in-game rewards (JISC). Each of these elements can be implemented in numerous ways and with different outcomes in mind.

Nah et al. (2014) reviewed the literature and identified eight game mechanics that are used extensively in educational contexts:

1. Points serve as a way to measure success or achievement. Points "may be used as rewards, as a form of investment for further progression towards the goals, or to indicate one's standing" (Nah et al., 2014). Points can be awarded for completing tasks or completing levels. They could be potentially be worth credit in the course, or they could be used as a form of in-game currency and exchanged for unlocked content, character upgrades, "puzzle hints, assignment extensions, quiz do-overs (allowing the buyer another three chances at a quiz), getting help on certain homework problems, extending a due date with no penalty, or using a larger index card for notes on a test" (Dicheva et al., 2015).

2. Levels/Stages "give players a sense of progression in the game" and can "serve as a form of rewards for task or assignment completion" (Nah et al., 2014). Types of levels include game levels (level 1, 2, 3, etc.), player levels (novice up to expert), and playing levels (easy, intermediate, difficult). Early levels might be easy to achieve, with increasing difficulty as the player moves through the game (Dicheva et al., 2015).

3. Badges "are recognized as a mark of appreciation or task accomplishment during the process of goal achievement." Badges inspire learners to "work towards future goals" and "motivate them to carry out future learning tasks" (Nah et al., 2014). They do not have to be associated with student grades to have a motivating influence (Hakulinen & Auvinen, 2014, as cited in Dicheva et al., 2015). Badges can be given for completing challenges, contributing to threads or discussions, or for doing readings (Dicheva et al., 2015).

4. Leaderboards are similar to badges in their goal to motivate students with the promise of being able to visually display their achievement. Leaderboards add an element of competition between students by displaying the levels and scores of the strongest students. It's important to note that "in order to avoid demotivation for those who are lower ranked, leaderboards usually display the top 5 or 10 scorers only." Nah et al. cite O'Donovan et al. as having determined that leaderboards are the most powerful gamification tool to motivate learners (2014).

5. Prizes and Rewards have also been found to be motivating when thoughtfully implemented. Nah et al. found that giving out small rewards is more effective than giving one large one, and that rewards should be evenly distributed through the

duration of the learning experience (2014). Similar to points, prizes or rewards could be exchanged for upgrades or to unlock features.

6. Progress bars are a visual representation of educational achievement. While "badges demonstrate achievements towards a particular level/goal, progress bars are used to track and display the overall goal progression" (Nah et al., 2014)

7. Storylines or narratives "help learners to achieve an ideal interest curve, where interest peaks around the beginning and end of the learning process, and to stay motivated throughout the learning process." When used effectively, they provide a "context for learning and problem solving," as well as helping "to illustrate the applicability of concepts to real-life" (Nah et al., 2014)

8. Feedback sets the criterion for performance and engagement with the game. Clear and immediate feedback has "been shown to be important for attaining the flow state, which is a state of engagement and immersion in an activity" (Nah et al., 2014). In their case study of the language-learning app Duolingo, JISC reviews how learners are encouraged to progress from lesson to lesson through feedback after each question. When a learner enters an incorrect answer:

• The incorrect component of the answer is indicated

• The correct answer is stated.

• The learner can use the tips function.

• The learner can also discuss the answer on a forum if they dispute it, or are still confused over what the answer is.

• The learner is immediately able to try a different question or quiz.

• There is no punishment or humiliation; the 'knock-back' is announced to the learner in private (JISC).

Implementing Gamification

The successful implementation of gamification depends upon the context and upon the players. Before implementing a gamified course, a thorough consideration of the situation and environment must be completed (JISC). Some things to consider before deciding to use gamification, according to JISC:

• What are the resource costs (budget, time) in implementation?

• What are the ongoing costs (budget, time) during use?

• How much lesson time will gamification occupy? How potentially distracting will it be from the objectives of the course?

Before designing your game, consider:

• How will your students react to a reward or incentives for pedagogical achievement?

• How will they react to seeing their fellow students "achieve and gain rewards (especially rewards which they have attempted, but failed, to acquire themselves)?"

• How public will their or their classmates' achievements be to the rest of the class? Who will be able to see the game data?

• Will the pursuit of the reward compromise the intended skill and knowledge retention (i.e. students trying to beat the system to succeed, rather than focusing on learning content)?

• Will there be disappointment or a disincentive to learn when "the gamification period ends and nongamifed learning resumes?" (JISC)

In their literature review, Dicheva et al. found that the majority of research being done had found that gamified learning had a positive impact on student learning, including:

"significantly higher engagement of students in forums, projects, and other learning activities; increased attendance, participation, and material downloads; positive effect on the quantity of students' contributions/ answers without a corresponding reduction in their quality; increased percentage of passing students

and participation in voluntary activities and challenging assignments; and minimizing the gap between the lowest and the top graders… The papers of this group also report that students considered the gamified instances to be more motivating, interesting, and easier to learn as compared to other courses" (2015)

In research that reported on less successful applications of gamification, Dicheva et al. found that poor game design was often at fault, such as gamified learning experiences that were missing "critical motivational elements." Faculty members who had negative experiences had many times overlooked the necessary ongoing investment of significant time and resources. Students who reported negative experiences described being unready for the autonomy offered by gamified learning, or not seeing the connection between achieving mastery in the game and their success in the course. Knowing the ability and motivation of your students, ensuring the game is fully relevant to the learning objectives of the course, and making a fair assessment of the workload involved, are therefore the keys to the success of any gamified learning experience (2015).

Example of Gamification

1.Quizziz

Quizizz is an online assessment free tool. It allows you to conduct studentpaced formative assessments in a fun and engaging way for students of all ages and class. It works on any device: web browser, iOS, Android and Chrome apps. It allows to teachers to create own quizzes. After providing students with a unique access code, a quiz can be recorded live as a timed competition or used as a homework with a specific deadline.

After the quizzes have been completed, students can review their answers. Furthermore, the resulting data is compiled into a spreadsheet to give the instructor a clear visual of the students' performance.

This immediate feedback can be used by teachers to revise future learning activities and altar the focus of material by putting a larger emphasis on concepts that students are struggling with.

You can access hundreds of ready-made learning quizzes or create your own. Join as a teacher, pick a quiz, and use the code for a virtual room to give to your students.

Privacy: The only personal information that the instructor needs to provide in order to make a quiz is a valid email address. The site's privacy policy states that this is not shared with anyone except to comply with the law, develop products, or protect the site's rights

How to Use Quizizz

1. Go to Quizizz.com and hit "GET STARTED".

2. If you want to use an existing quiz, you can use the "Search for quizzes" box and browse. Once you have selected a quiz, skip to step 8. If you want to create your own quiz, select the "Create" panel, then the "Sign Up" panel and fill in the form.

3. Enter a name for the quiz and an image if you like. You can also select its language and make it either public or private.

4. Fill in a question, as well as answers, and be sure to click the "incorrect" icon next to the correct answer in order to change it to "correct". You can also add a corresponding image if you would like.

5. Select "+ New Question" and repeat step 4. Do this until you have made all of your questions.

6. Hit "Finish" in the top right corner.

7. Select the appropriate grade range, subject(s), and topic(s). You can also add tags to make it easier to search for.

8. You can either select "PLAY LIVE!" or "HOMEWORK" and choose the desired attributes.

9. Students can go to Quizizz.com/join and type in the 6-digit code to participate in the live quiz or complete the homework. They will be asked to enter a name to be identified by.

10. Once the students are finished, refresh your page and you will be able to view the results of the quiz. Click on name to expand and get more detailed, question-by-question results.

How to create a quiz in Quizizz.

The Quizizz editor lets you make quizzes with the following question types:

1. Multiple correct answers

2. Images as answer choices

3. Up to 5 answer choices.

4. Check box type questions.

5. Fill-in the blank questions.

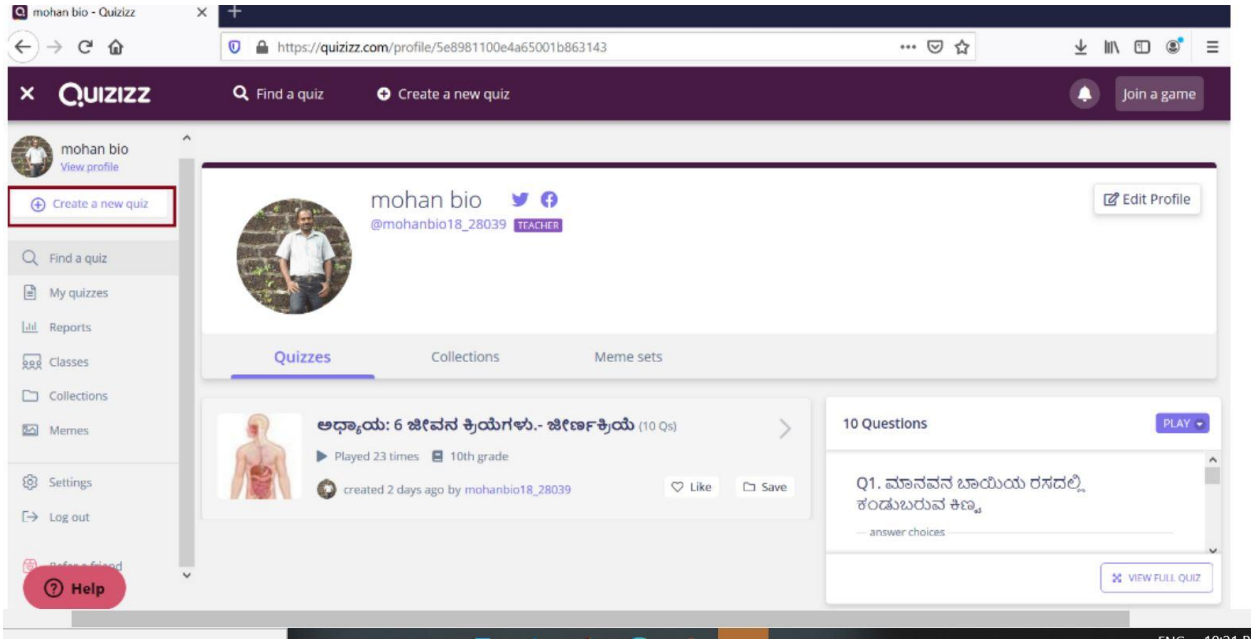
6. Poll type questions.

7. Open ended questions.

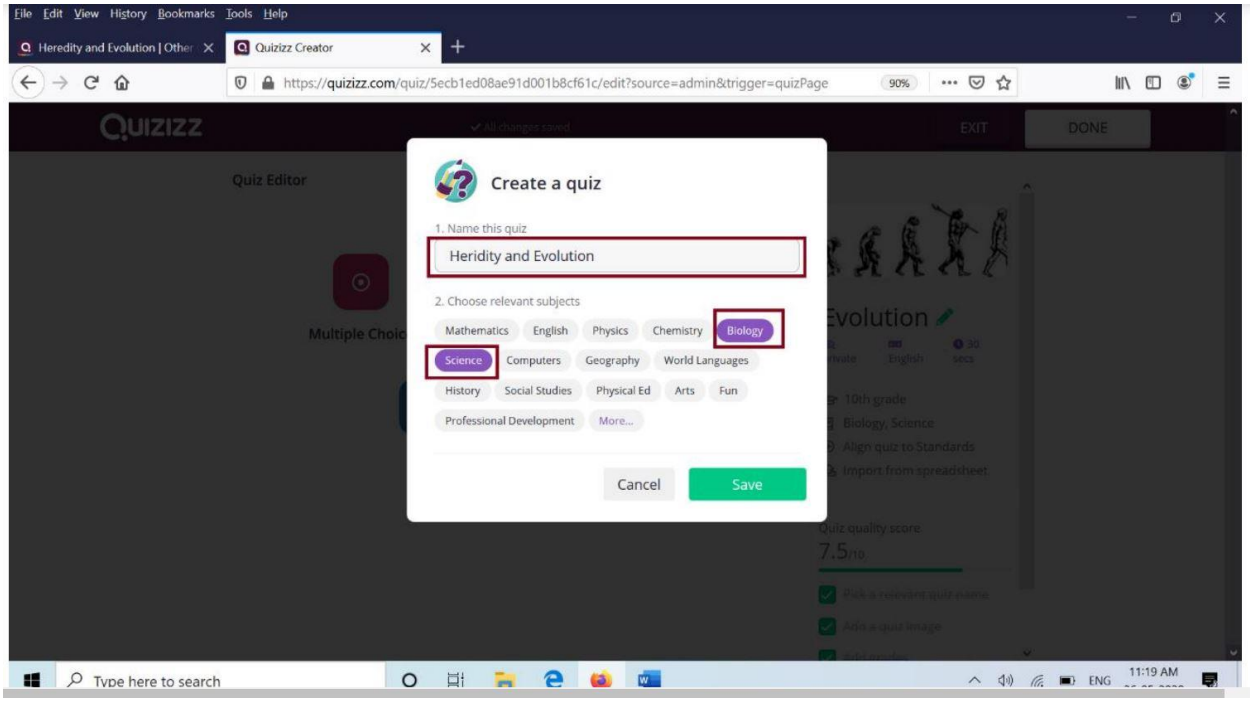
You can choose to have a combination of these question types in the same quiz.

Here are the steps to create a quiz using the Quizizz editor:

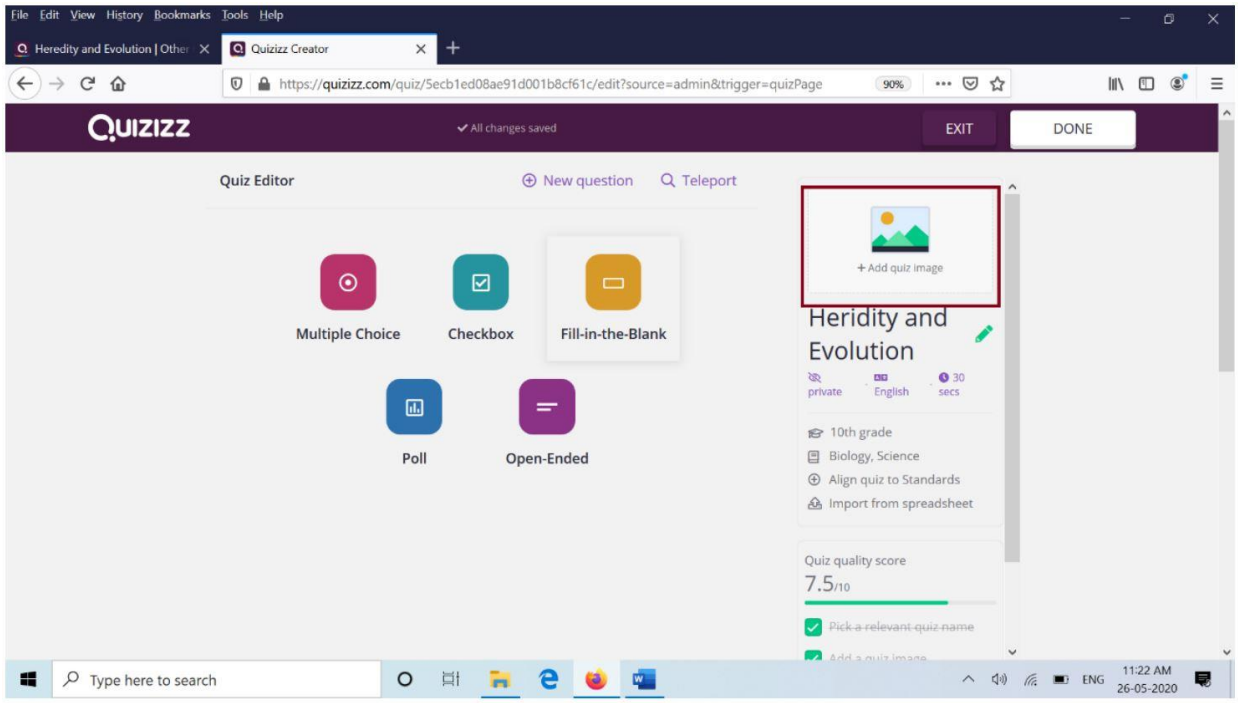
1. Once you are logged in, click on the 'Create new quiz' button from the navigation bar.

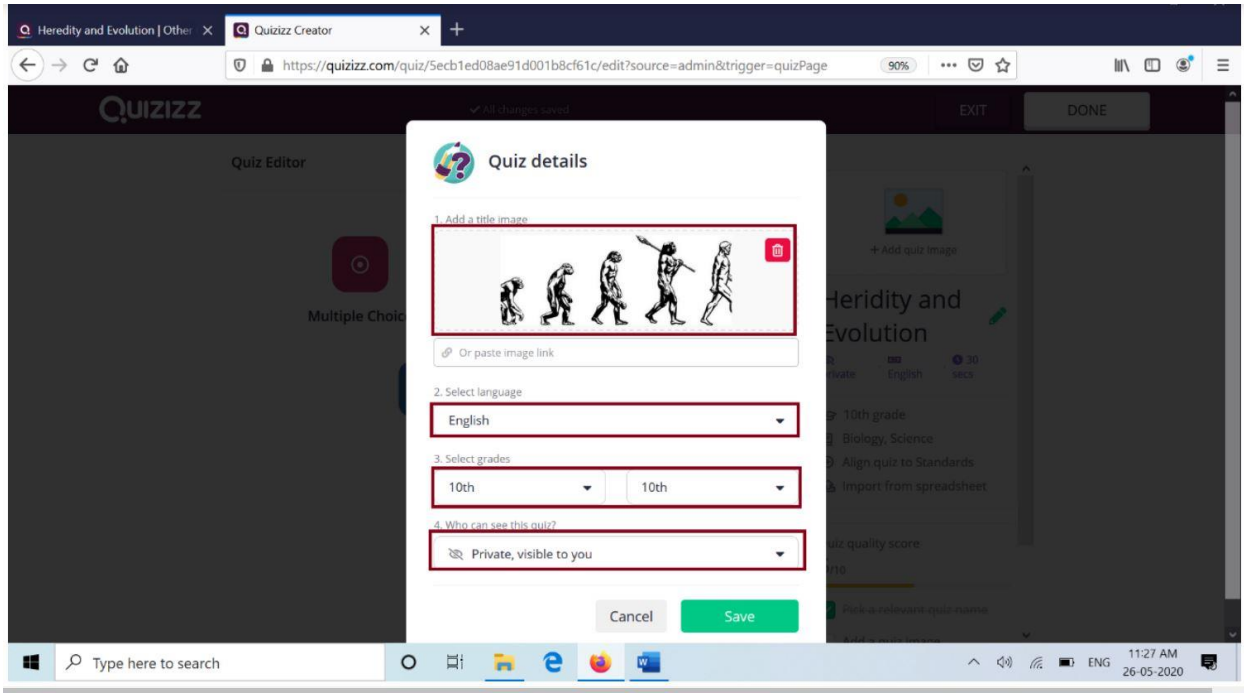


2. You now get to see a popup that prompts you to create the quiz. Enter a name and relevant subject Click the ‘next’ 'Save' button to continue.

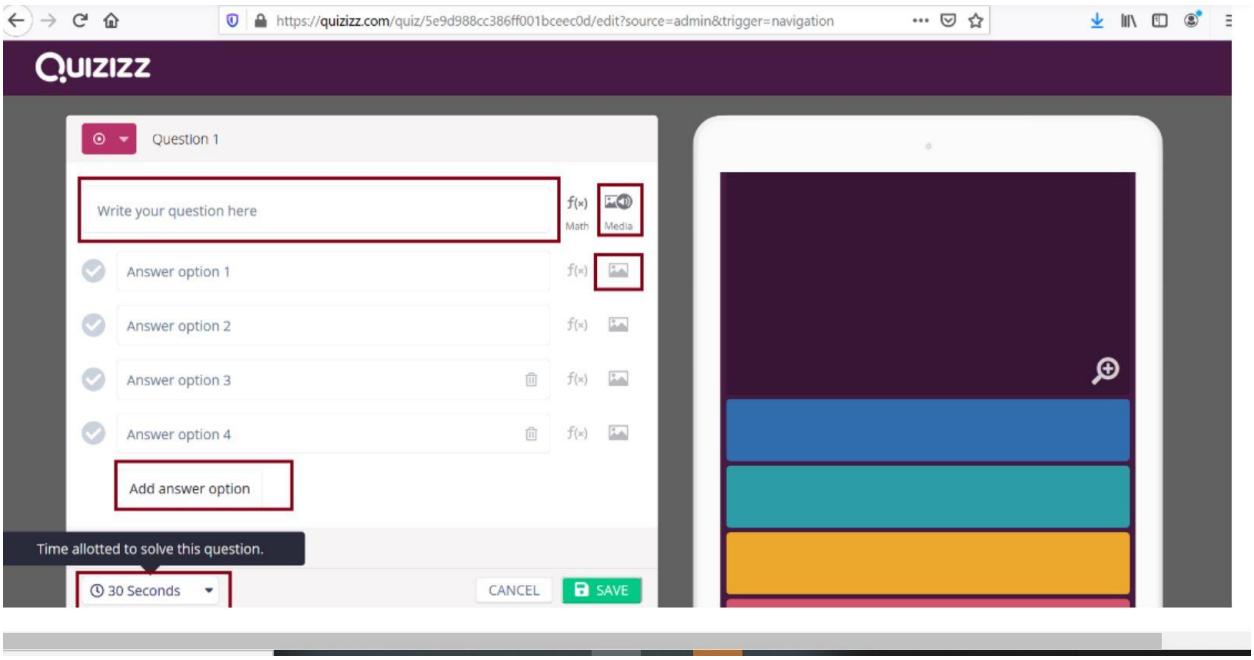


3. Click on 'Create a new question' button to add a new question to your quiz. Select type of questions, an appropriate image for the quiz, language, for which standard and Click the 'Save' button to continue.

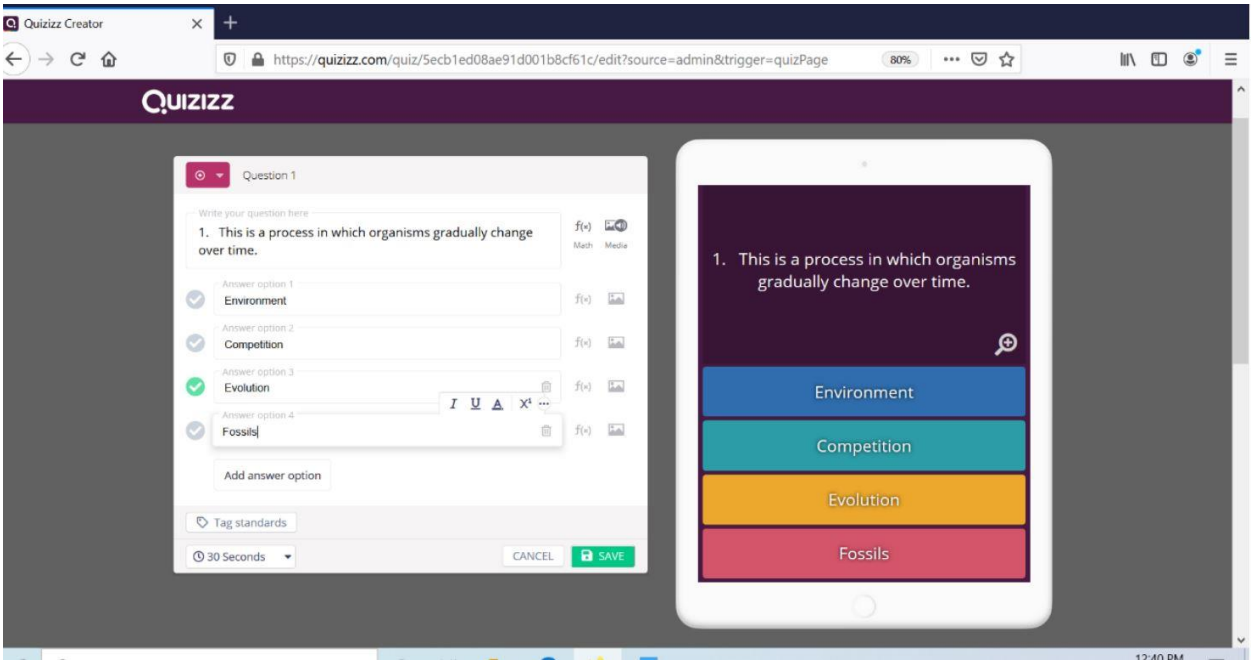




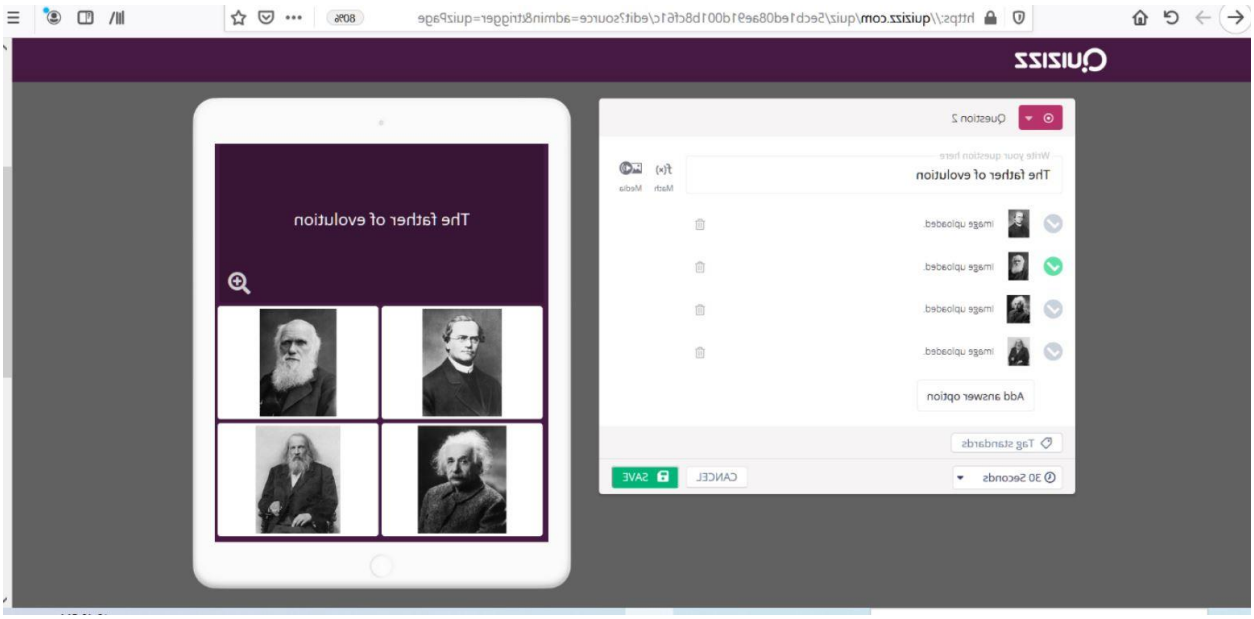
4. You can add questions with text and/or images. To add an image to a question, click on the 'Image' button next to the question text field. Adjust the time taken to answer the question from the drop-down.

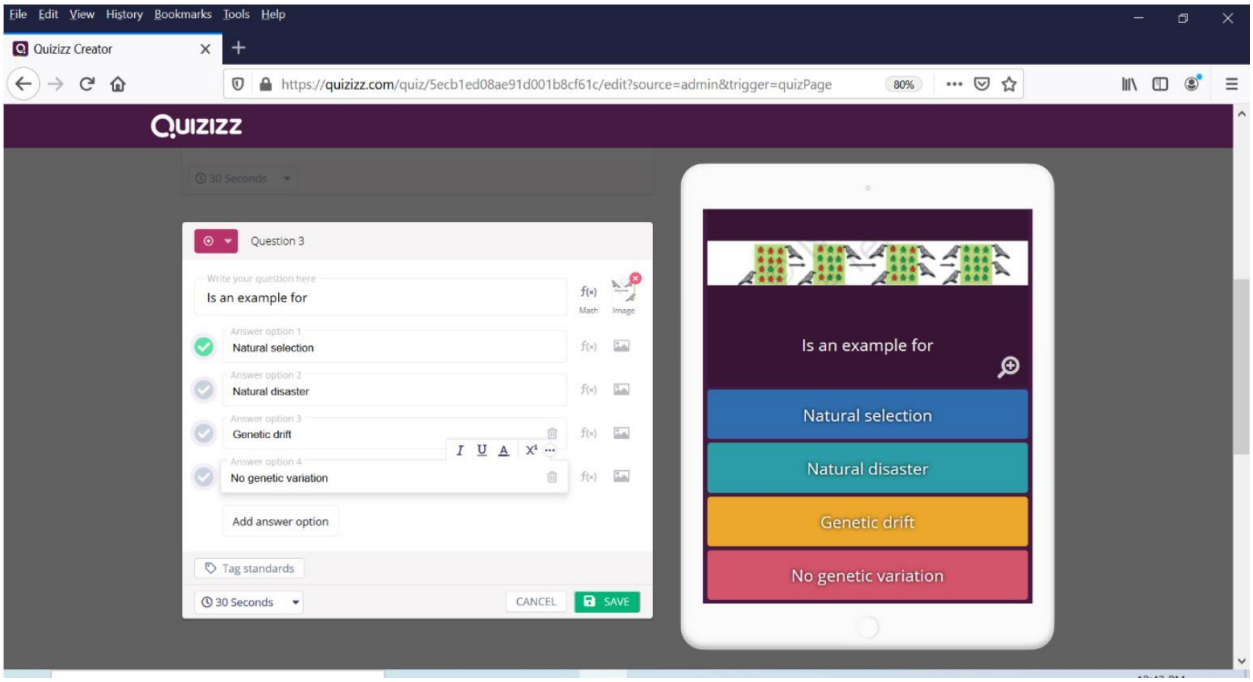


5. Provide some answer choices for the question. All questions should have between two to five answer options. Click the Add answer option if you want and save.

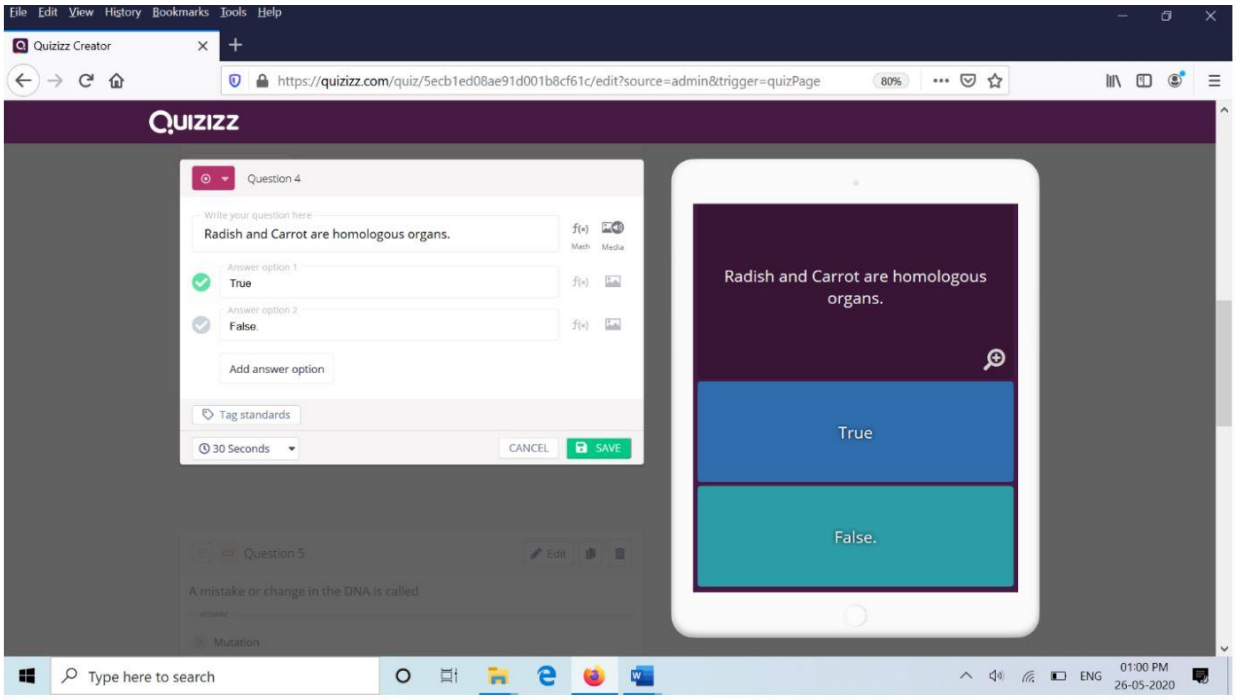


6. Now you can also add images as answer options or image in the question. Upload an image for the answer options (from the dropdown as shown below).

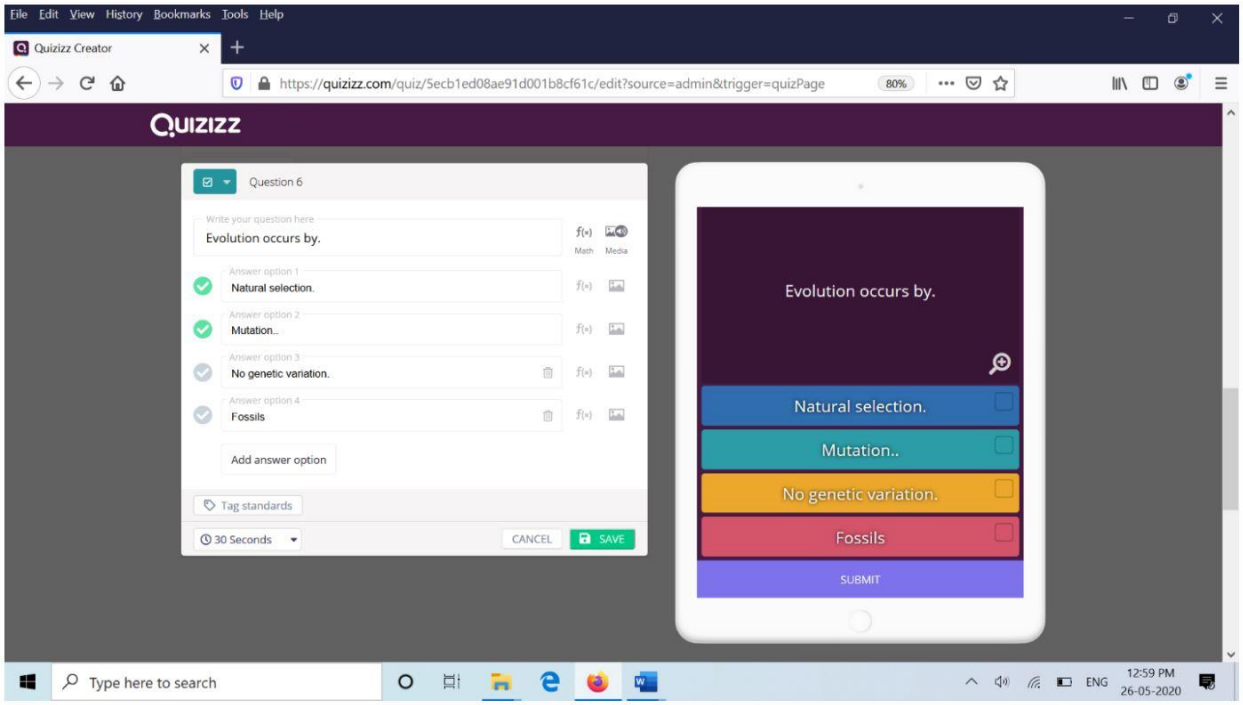




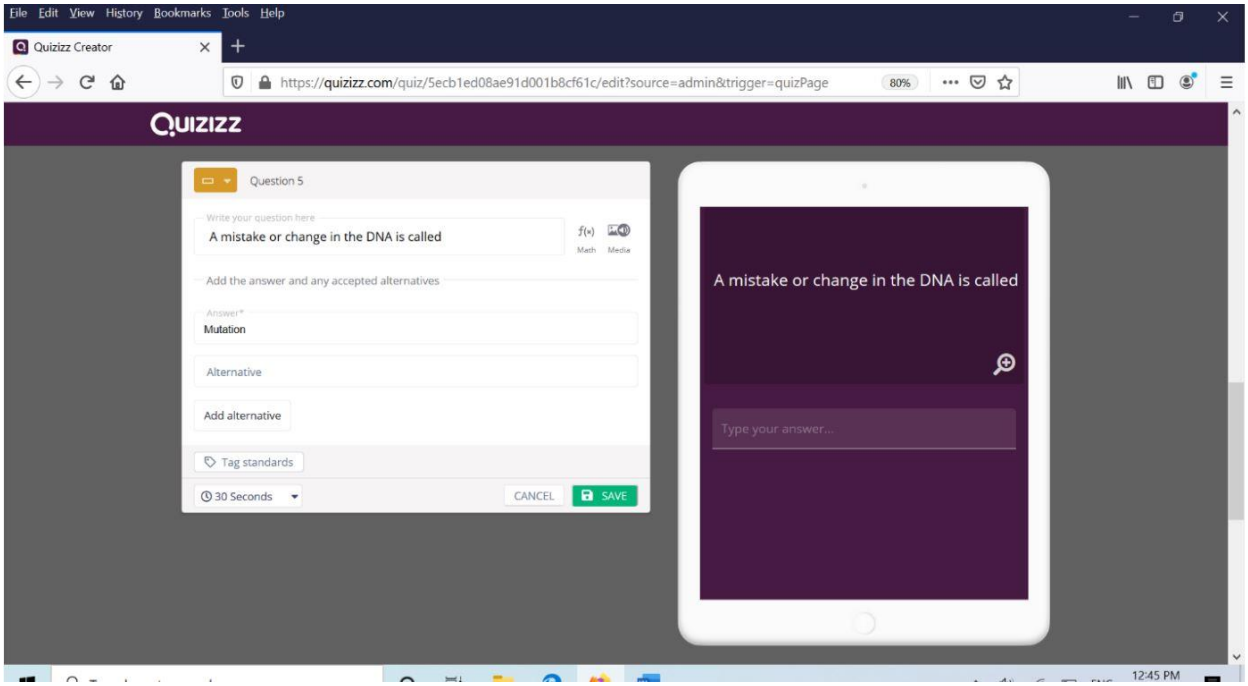
True or false, Yes or no type questions



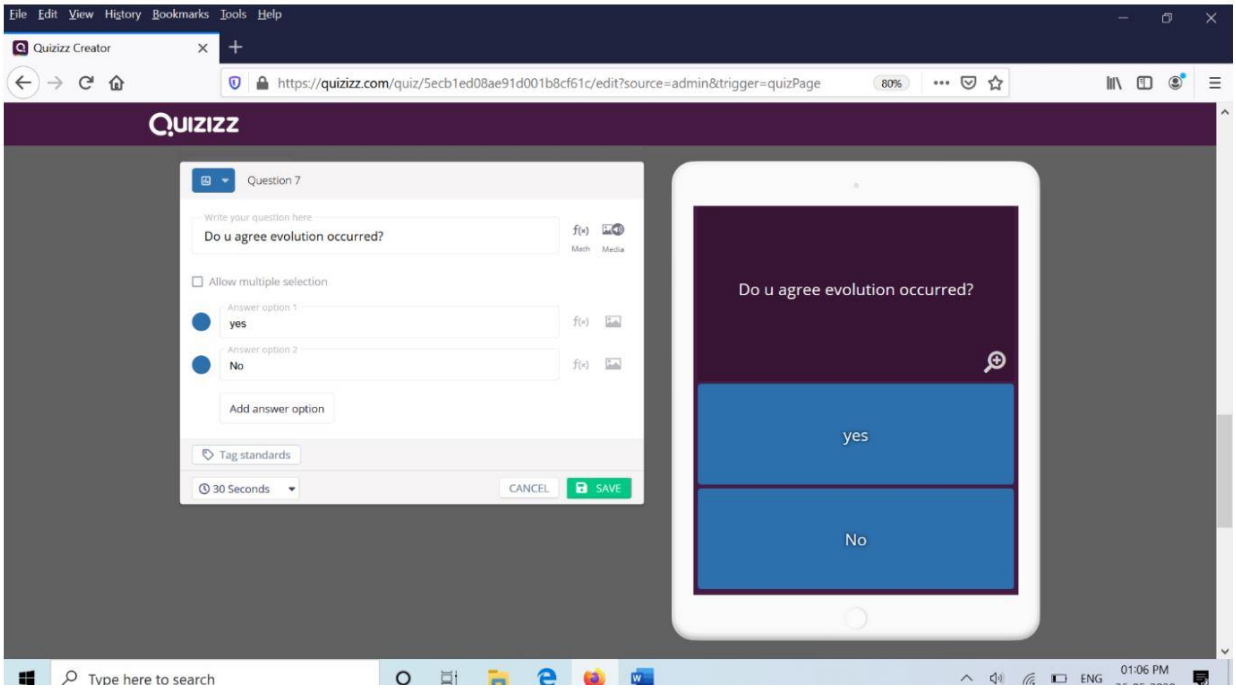
Check box type question, As there are multiple answer for a question.



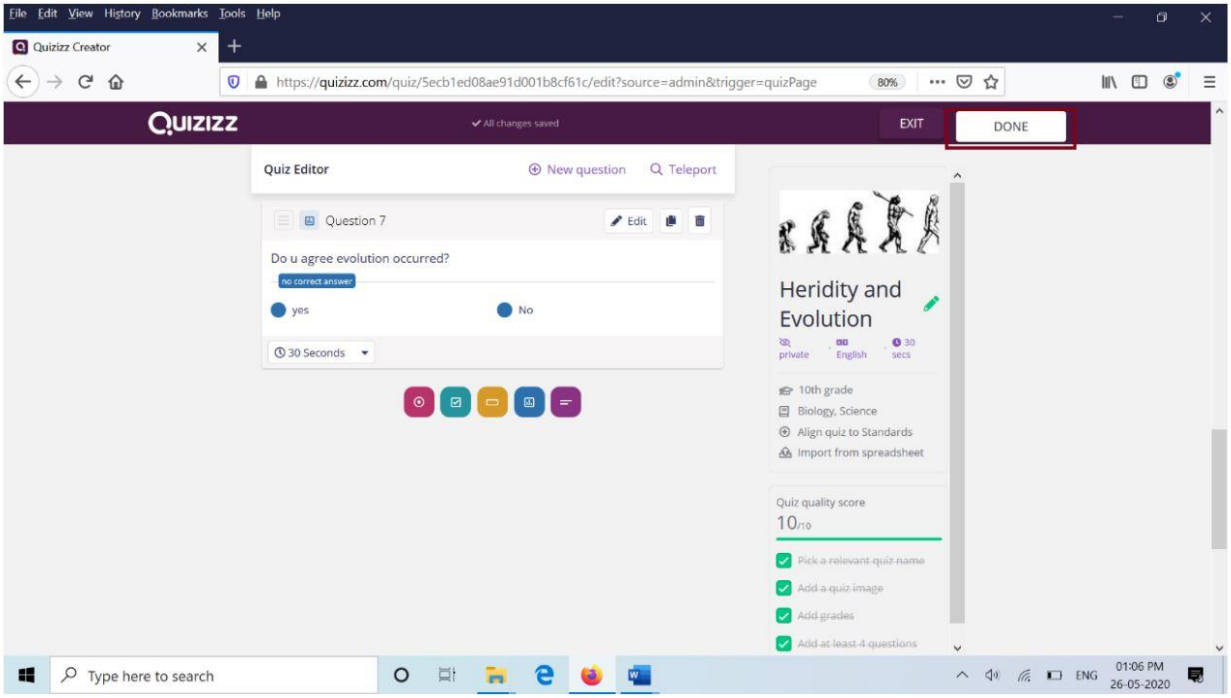
Fill in the blank like question: correct answer and alternative answer should be typed.



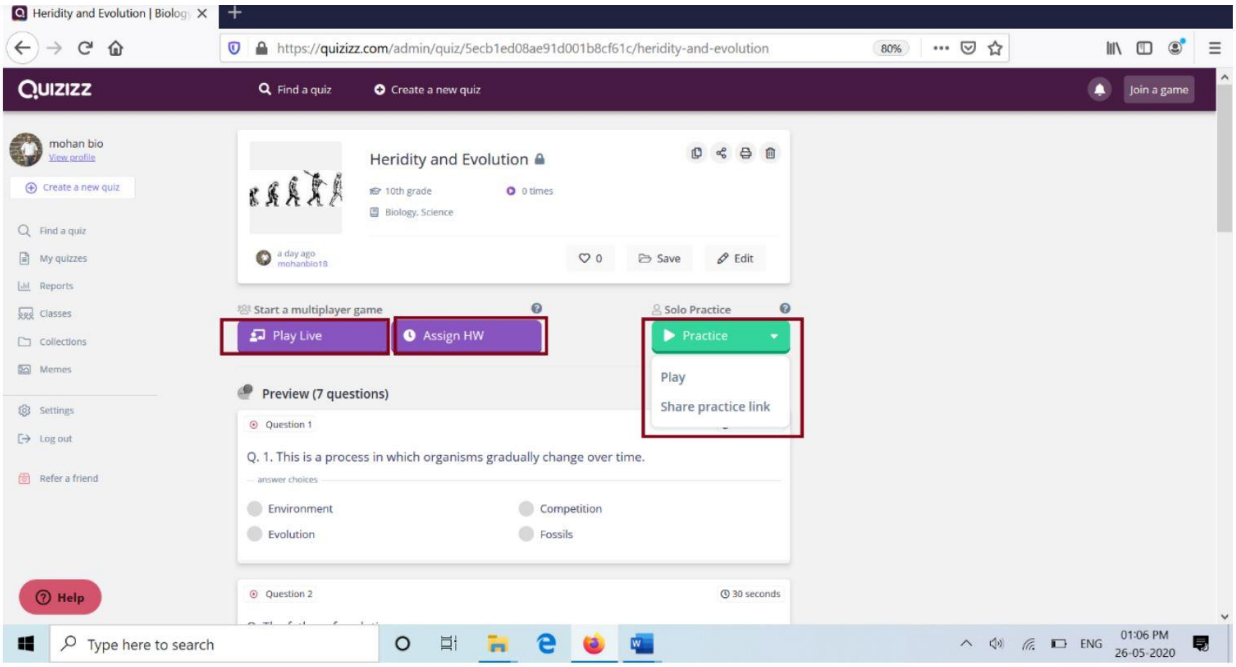
Poll type question. No grading will occurs. Voteing type question will be given for this.



7. Once you have added all the questions to your quiz, click on the ‘Done’ button to publish the quiz.



8. Once your quiz is ready. U can check it out by clicking on practice. Or u can start the quiz by clicking on play live, or u can assign as a homework. and click continue.



and click continue.

9. Share the game through google classroom, Microsoft team, or copy the link and share with email, WhatsApp etc.

10. The player or students who receive the link can join with their name in laptop or in mobile. If they want to hear the question read aloud option is there.

11. Once the player joined start the game clicking on ‘start’. At particular interval of time u want to stop the game click on ‘end game’

12. you will get the performance of all the player who attended the quiz.

you can download the report in excel also for further analysis.

CHAPTER 4

MIND MAPPING

Mind mapping

Mind mapping is an effective means to take notes and brainstorm essay topics. A mind map involves writing down a central theme and thinking of new and related ideas which radiate out from the centre. By focusing on key ideas written down in your own words and looking for connections between them, you can map knowledge in a way that will help you to better understand and retain information.

What is mind mapping?

Mind mapping was developed as an effective method for generating ideas by association. In order to create a mind map, you usually start in the middle of the page with the central theme/main idea and from that point you work outward in all directions to create a growing diagram composed of keywords, phrases, concepts, facts and figures.

It can be used for assignments and essay writing especially in the initial stages, where it is an ideal strategy to use for your 'thinking'. Mind mapping can be used for generating, visualising, organising, note-taking, problem-solving, decision-making, revising and clarifying your university topic, so that you can get started with assessment tasks. Essentially, a mind map is used to 'brainstorm' a topic and is a great strategy for students.

How do I use mind mapping?

You can use mind mapping for the following:

♣ taking notes in a lecture and listening for the most important points or keywords

♣ showing links and relationships between the main ideas in your subject

♣ brainstorming all the things you already know about an essay question

♣ planning the early stages of an essay by visualising all the aspects of the question

♣ organising your ideas and information by making it accessible on a single page

♣ stimulating creative thinking and creative solutions to problems

♣ reviewing learning in preparation for a test or examination.

How do I get started with mind mapping?

1) Place the central theme/main idea or controlling point in the centre of your page. You may find it easier to place your page on the side, in landscape orientation, which is easier for drawing purposes.

2) Use lines, arrows, speech bubbles, branches and different colours as ways of showing the connection between the central theme/main idea and your ideas which stem from that focus. The relationships are important, as they may form your essay paragraphs.

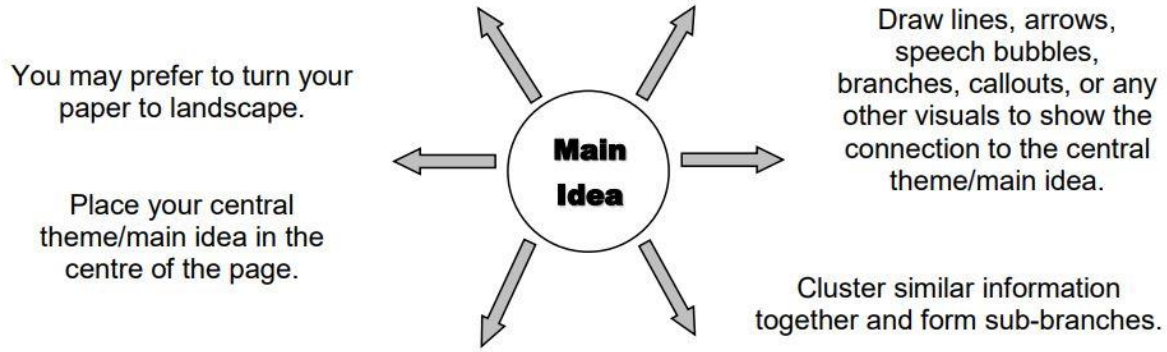
3) Avoid creating an artistic masterpiece. You should draw quickly without major pauses or editing. Chances are, your first idea was fine and you placed that idea in the direction or on the branch you thought made the most sense. It is important in the initial stages of mind mapping to consider every possibility, even those you may not use.

4) Choose different colours to symbolise different things e.g. you may choose blue for something you must incorporate in your paper, black for other good ideas, and red for the things you need to research or check with your tutor/lecturer. Your method is entirely up to you, but try to remain consistent so that you can better reflect on your mind map at a later stage.

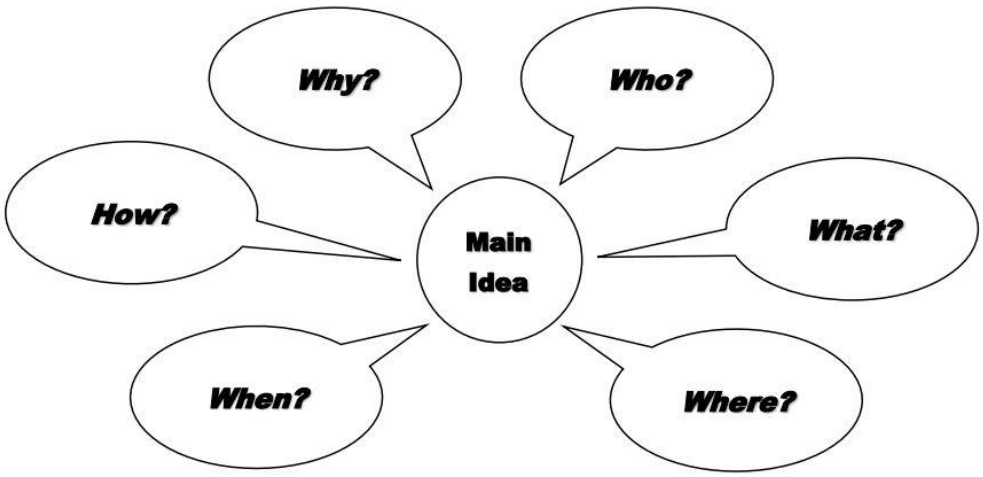
5) Leave some space on your page. The reason for this is that you can continue to add to your diagram over a period of time. If A4 sized paper feels too small, you may like to use A3.

What does a mind map look like?

A standard mind map begins with the following shape:



The following mind map is a basic model with which you can get started on a research topic:

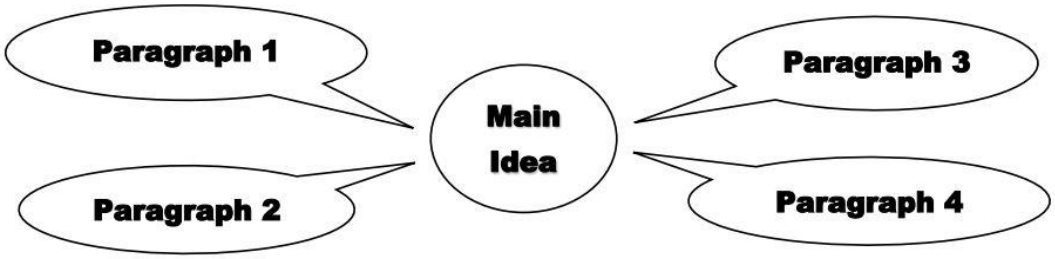


Example: Mind Mapping 'Strategies for Climate Change' Essay Topic

How do I turn my mind map into an academic essay?

Before you can begin to write your essay paper, you must first understand and determine what the 'main' idea of your writing will be. What is the central theme/main idea or controlling point that you are trying to convey to your reader? Whatever the topic, it is always a good idea to think about the issues that surround that topic and mind mapping is an excellent form of brainstorming.

The information that comprises your paragraphs must have a relationship to that controlling point. The decision about what to include in your paragraphs ultimately begins with your ideas. Ideally, each paragraph in an essay should contain one idea or cover one aspect relevant to the central theme on your mind map.



What are the benefits of using mind mapping?

To achieve higher levels of concentration and creativity, together with greater organisation and more concise communication, mind mapping might be an effective strategy for you to consider. The benefits of mind mapping are many and varied. In summary they include:

♣ giving you an overview of a large subject/broad topic and allowing you to represent it in a more concise fashion

♣ encouraging you to see the bigger picture and creative pathways

♣ enabling you to plan/make choices about the selection of resource material you have for an assignment and where you are going to place it

♣ providing you with a more attractive and enjoyable format for your eye/brain to look at, muse over and remember

What Is Mind Mapping Software?

Mind map software lets you create a diagram or flowchart of your ideas. This helps you easily illustrate the relationships and hierarchy between concepts.

Most mind mapping tools come in different sizes to suit various needs, offering other functionality.

Generally, your average mind map maker falls under one (or more) of these categories:

- **Diagramming**: a technical diagram such as engineering flowcharts, architectural designs, network diagrams, etc.
- **Brainstorming**: problem-solving sessions to organize and present an idea visually
- **Business intelligence**: visualize data as charts by importing it from business applications
- **Software development**: prepare site map diagrams, software wireframes, etc.

Why use mind mapping software?

Useful for any brainstorming session, mind mapping apps helps you plan and organize ideas for better clarity and understanding. It can also help you easily identify the best idea or solution from all the potentials you have.
So why not use a pen and paper instead? That would be like making a sandcastle on the shoreline, waiting for the waves to wash it away.
Unless you want to lose your mind map to the ocean of other things you have to remember, using a piece of paper for mapping may not be the optimal way. If your idea has many moving parts, mapping it on a piece of paper can make it seem scattered and disconnected.

Not only will a mind mapping app help you map out complex ideas quickly, but you also won't have to worry about misplacing them.

What makes a great mind mapping software?

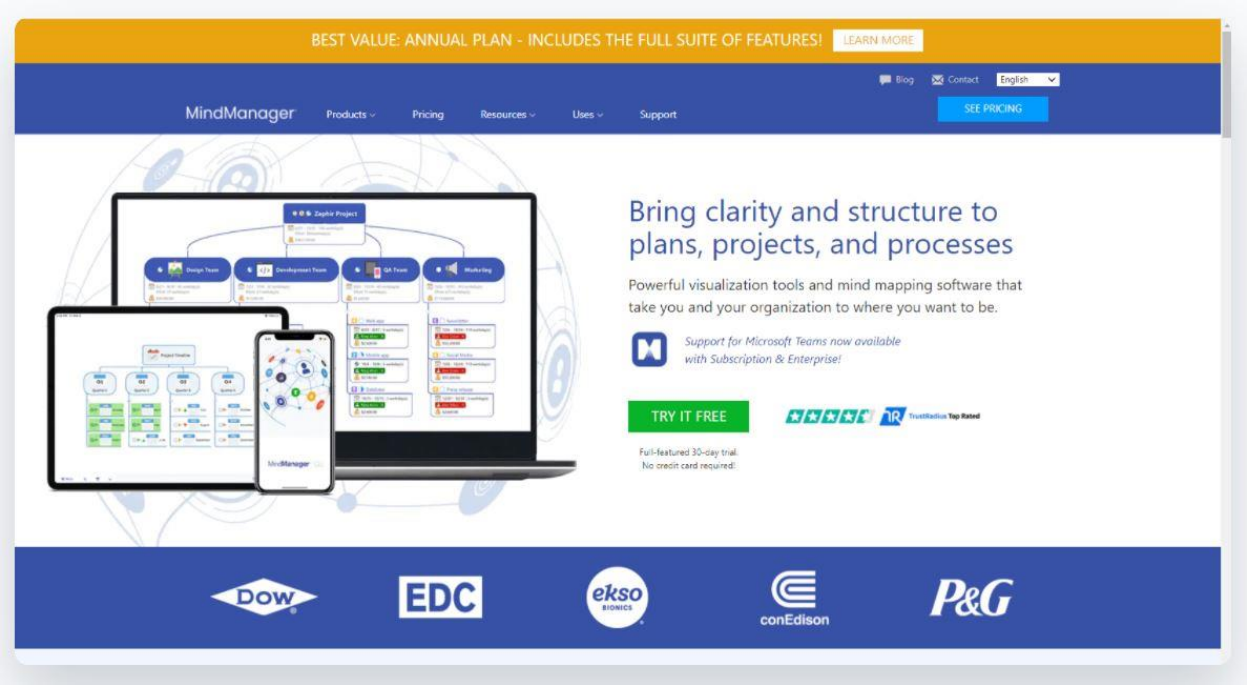
When choosing an excellent mind mapping tool, here are three key features to look out for:

- **User-friendliness**: using the mapping tool should be as easy as drawing on paper. You shouldn't have to dig through multiple menus to create a simple mind map
- **Large canvas**: a large digital canvas ensures that you never run out of space to draw. After all, you can't put a limit on creativity and ideation
- **Collaboration**: essential for agile and scrum teams, real-time collaboration features let you share your mind maps with your entire team. This keeps everyone in the loop about the project

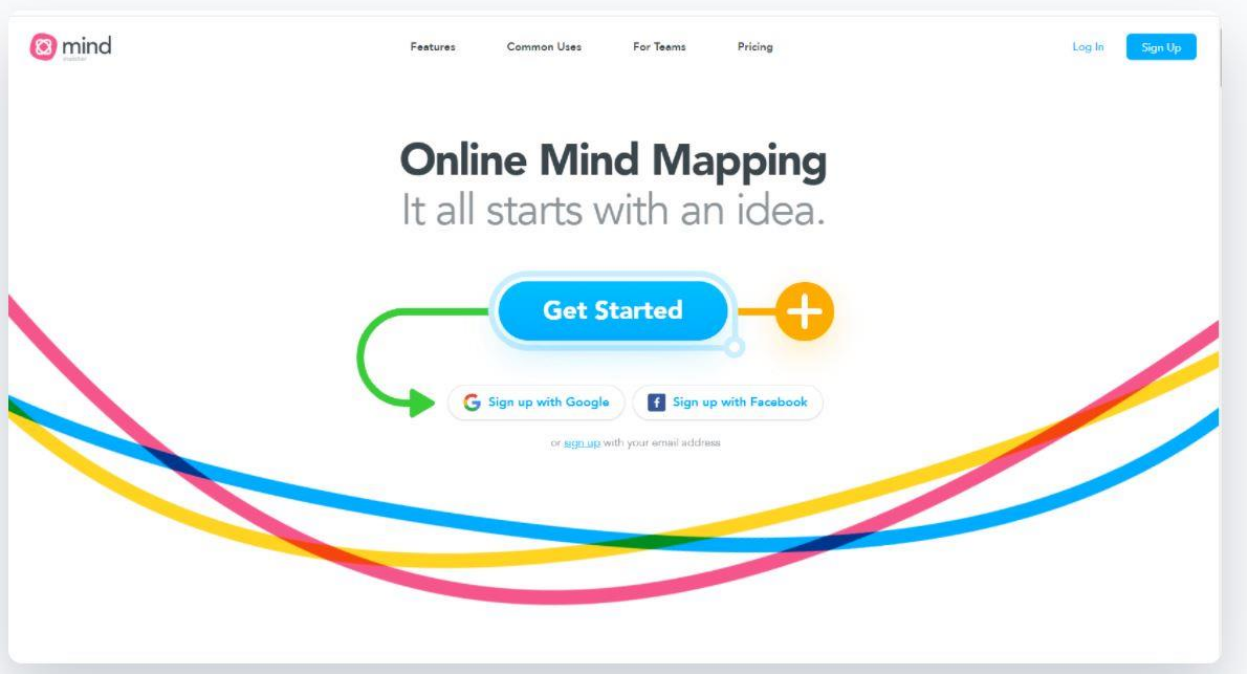
Examples of Mind Mapping Software

1-Mimind

2-MindManager



3-MindMeister


mind
Features
Common Uses
For Teams
Pricing
Log In
Sign Up
Online Mind Mapping
It all starts with an idea.
Get Started
Sign up with Google
Sign up with Facebook
or sign up with your email address

CHAPTER 5

E-TESTING

What is an e-test?

E-testing is a rapidly growing area of e-assessment involving the delivery of examinations and assessments on screen, either using local systems or web-based systems.

An e-test is any test that replicates or replaces paper based tests with a computer screen, also referred to as on-screen tests. This involves the transfer of paper tests to computer with little or no change to their appearance on paper. Any one qualification may employ one or any combination of methods to take e-testing to the computer screen.

This may include variations that could not be easily replicated on paper, such as video or audio clips, and animated quizzes. Further possibilities for e-testing include the use of full ICT interactivity. This often uses 'virtual situations' requiring the candidate to process information to arrive at the required solution.

E-testing arrangements have been well developed by some awarding bodies. Centres should refer to any specific guidelines produced by awarding bodies by whom they are approved (or intend to become approved) to offer e-testing, as well as using the resources offered in the toolkit.

What are the advantages of E-Tests?

1. **It saves paper.**
   You never have to print an exam for your students and hand them out. Saves paper. Saves trees. Everybody happy.

2. **It saves time.**
   You can setup an exam in such a way that it will auto-grade itself. If you only use multiple choice questions you never have to check an exam

again. The online exam system will take care of that hassle. Completly automated.

3. **It saves more time.**
   The distribution of the exam doens't take you any time. Just upload the email addressess of your students and send them an invite. And after the exam they get their result instantly.

4. **It saves you money.**
   You don't need to buy any paper. Sending an email is free. On top of that you save on the logistics: your students don't have to assemble in classroom to take the exam. They can do it within a given time frame from their own device. You don't have to rent a classroom. You don't have to hire someone to check the students taking the exam.

5. **It saves the student money.**
   Students don't have to travel to a specific location to conduct the exam. So even for students from remote area's it's possible to take the exam.

6. **It's more secure.**
   You can make a big question bank with a lot of questions. Every student gets a random selection from that question bank. So it's of little use to share the questions among the exam takers to give them a head start. Try that on paper ;)

The Disadvantages Of E-Tests

And now for the disadvantages:

1. You have to keep in mind that your students will take the exam on their own device in their own time with nobody to check up on them, so you have to alter your questions to provide for this situation. You have to ask questions which are not easily to be retrieved from books or the internet. Or you can add a timer to each question so their is no time to search for the answer.

2. Open text questions are possible, but they don't auto-grade, so you have to check them yourself.

3. An online exam system is a little bit more susceptible for fraud. So you have to keep that in mind if you setup your exam. Do you want to share the results immediatly after the result? In that case you can setup a question bank to solve the issue of fraud. Handing out all questions & Answers of a question bank to students is ok. Because they have to learn all the questions & answers by heart. And when they're done they master the material. Read more about proctored exams.

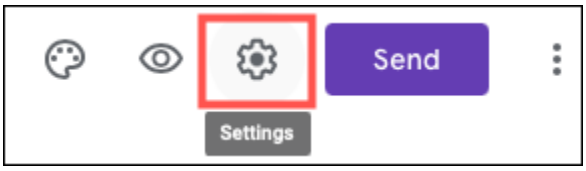
How to create a quiz or test using Google Forms

If you need to make quizzes for your students, you probably already know that Google Forms is a great way to do that. Most people already have a Google account, so it’s easy to get started. And, like most of Google’s basic tools, it’s free.

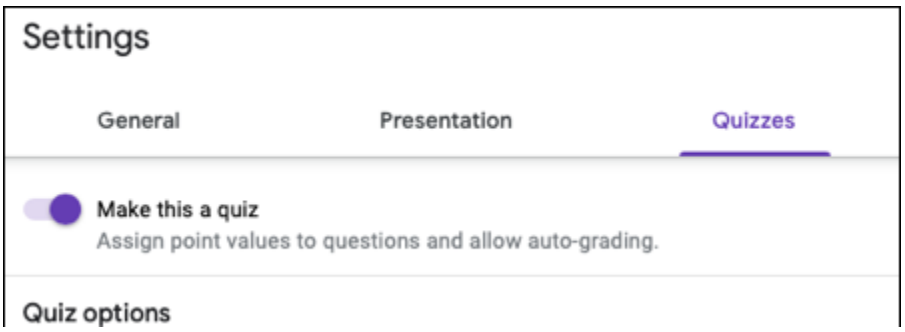
Google Forms

Tip: The quickest way to create a quiz is to go to g.co/createaquiz .

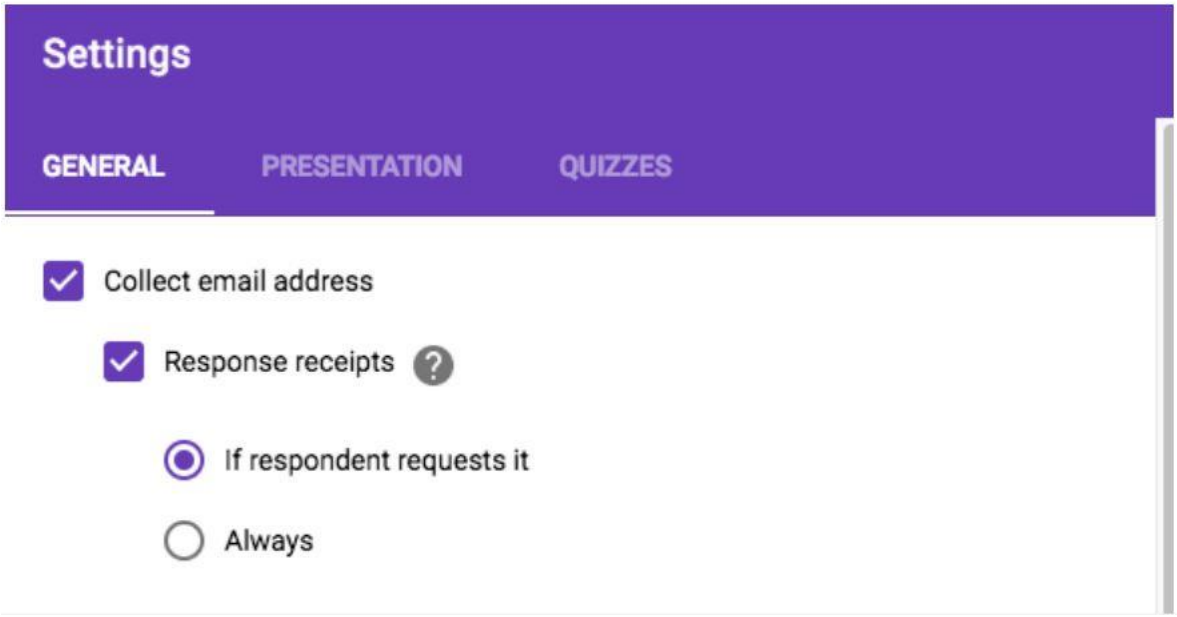
1. Open a form in Google Forms.
2. At the top of the form, click Settings.



3. Turn on Make this a quiz.



- Optional: To collect email addresses, next to “Responses,” click the Down arrow ⌄ and turn on Collect email addresses.



Make an answer key, assign points & add automatic feedback

You can make an answer key on certain question types:

Short answer

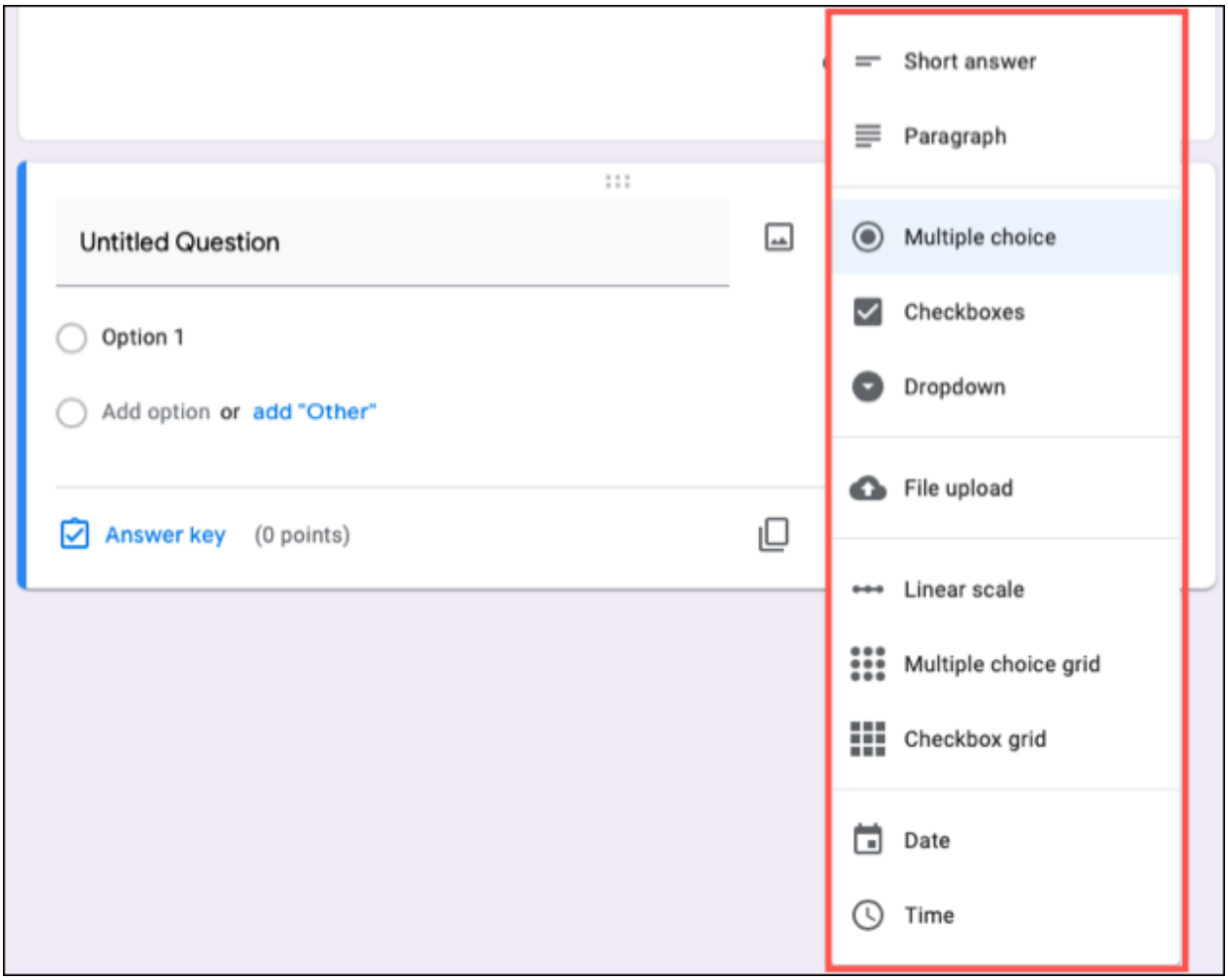
Multiple choice

Checkboxes

Dropdown

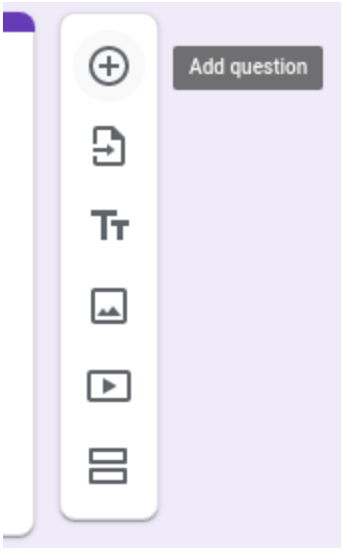
Multiple choice grid

Checkbox grid

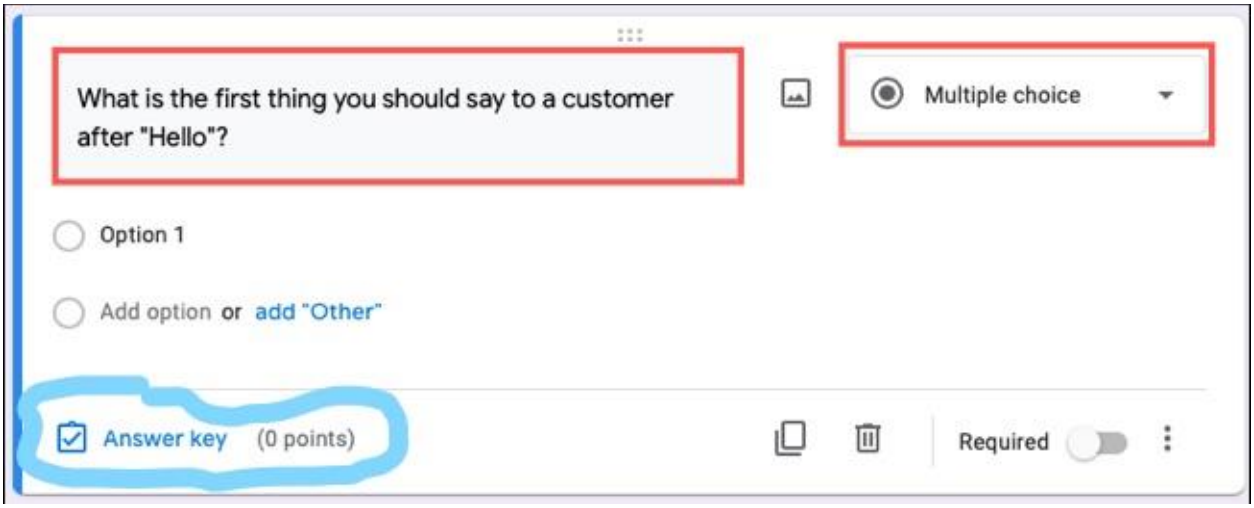


Create an answer key

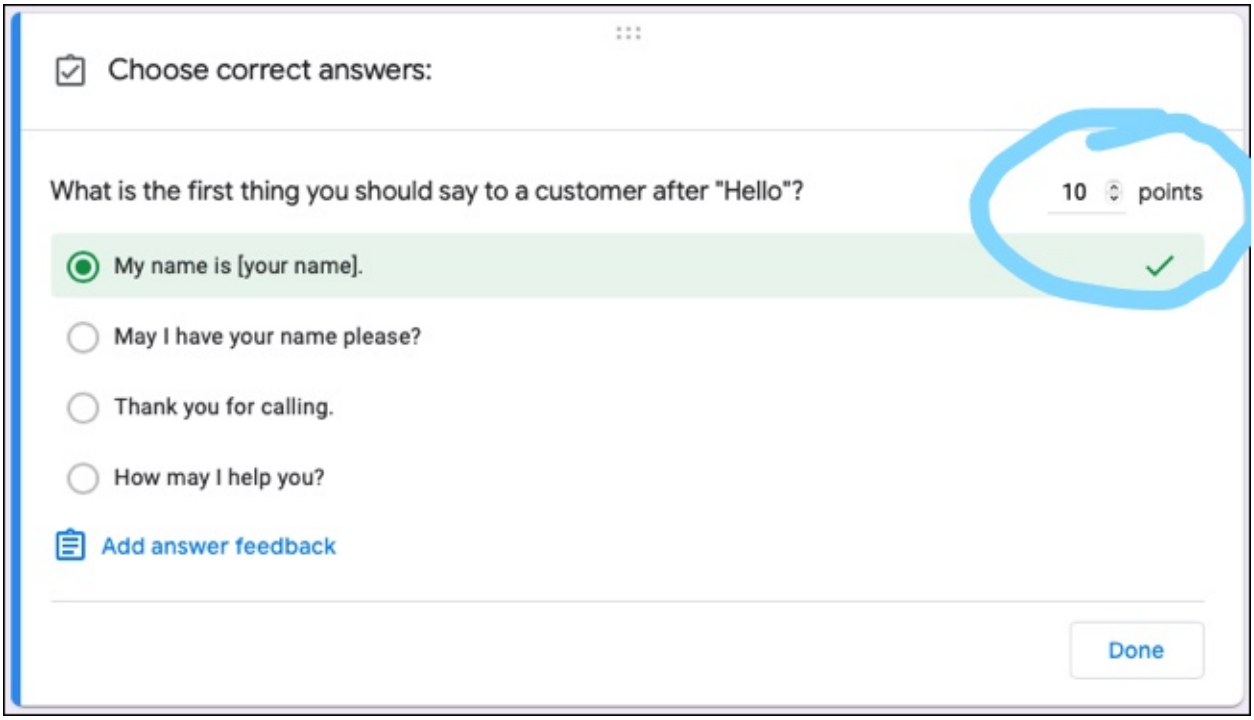
1. To add a question, click Add question ⊕.



2. Fill out your question and answers.
3. In the bottom left of the question, click Answer key.



4. Choose the answer or answers that are correct.
5. In the top right of the question, choose how many points the question is worth.



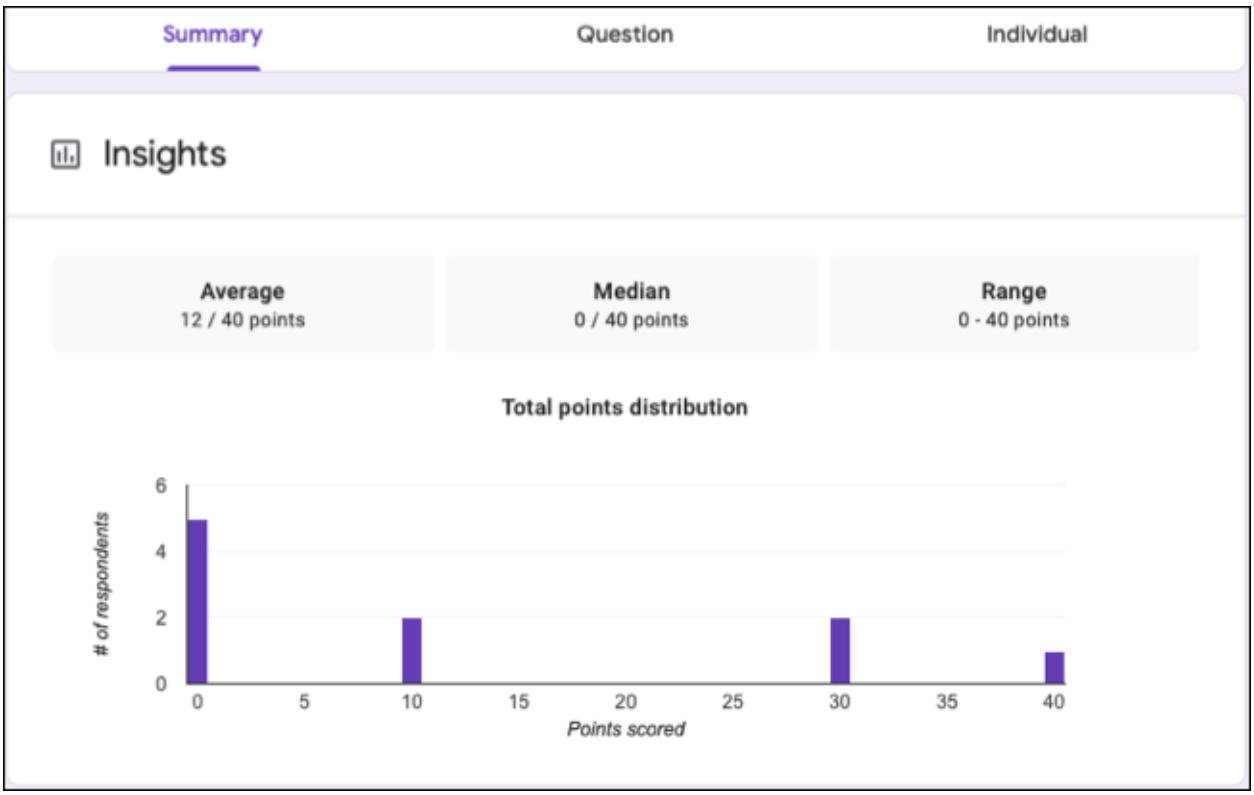
- To add a written or YouTube video explanation to an answer, click Add answer feedback.
- You can edit questions or answers when you click on them.

Note: You can assign points and add feedback on all question types.

Grade quizzes

You can see automatic summaries for all quiz responses, including:

- Frequently missed questions
- Graphs marked with correct answers
- Average, median, and range of scores



Grade individual responses

If you collect email addresses, you can assign points and leave feedback on individual responses. After you grade each response, save your changes.

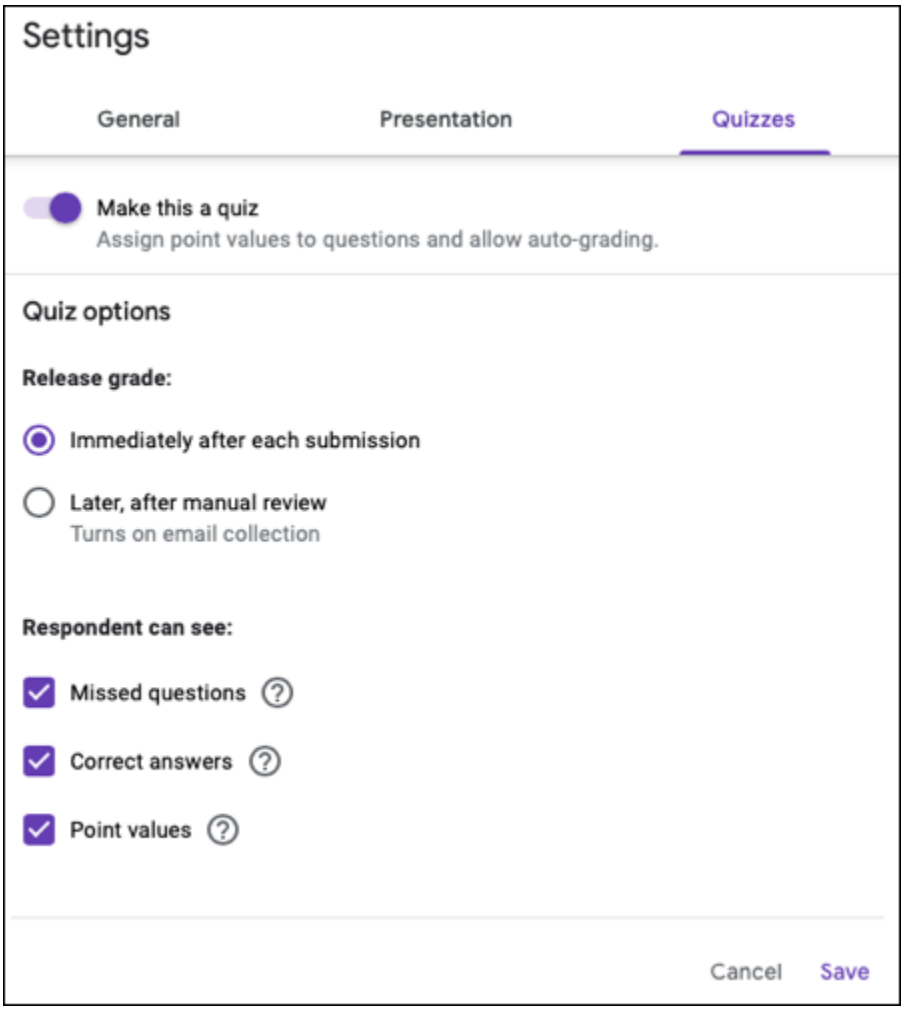
1. In Google Forms, open a quiz.
2. At the top, click Responses.
3. Click Individual.
4. To move between individuals, click Previous ‹ or Next ›.
5. Find the question you want to grade.
    - In the top right, enter how many points the response earned.
    - Under the answer, click Add feedback.
6. Enter your feedback and click Save.
7. To save your changes, at the bottom, click Save.

Share results

If you collect email addresses in your form, you can send results immediately or wait until you're ready to share them.

Change how you release grades

1. At the top of the form, click Settings.
2. Turn on Make this a quiz.
3. Under "Release grades," select an option:
    - Immediately after each submission
    - Later, after manual review



Email results after review

1. In Google Forms, open a quiz.
2. At the top, click Responses › Individual.
3. At the top right of a response with a recorded email address, click Release score.
4. Check the boxes next to the people you want to email.
5. Click Send emails and release.

CHAPTER 6

USING VIDEO IN TEACHING

USING VIDEO IN TEACHING

Using videos in the classroom is a very good idea. Not only does this provide a teacher with a wide range of extraordinary benefits but it's a fun experiment for kids as well and they will certainly appreciate the entire experience to begin with. It's all about having the right approach and attention to detail here something that every teacher should focus on if he/she wants to deliver the best results.

Moreover, videos can easily showcase 3D images, animations, unique concepts and so on. They will also integrate experiments that are hard to perform in class or which can pose quite a lot of danger. On top of that, videos have the ability to bring literature, music, history and many other interesting things directly in front of the users. It's fun, easy to do, refined and it does provide you with a very good value. You should totally consider it just because it helps quite a bit!

The benefits for teachers using videos in the classroom

There are quite a lot of benefits that come from using videos during any classroom and learning session. But is it a good idea to do this, what benefits can you obtain here? With that in mind, here you can find the 10 major benefits that you can acquire via using videos in the classroom.

- **1. Videos are easier to be accepted by students**

Videos are maybe the best medium that you can use in order to speak with the new generation. Kids do have a very good time watching videos online and videos are maybe the perfect medium that you can use for showcasing new knowledge. They also boost communication and entice you to learn new stuff.

- **2. Immerse students in the prodcution**

Videos offer a stellar model for learner output which means that learners can create their own version of the original. The immersion factor is great plus students have the ability to create their own version in the classroom.

- **3. Stimulate activities**

Thanks to videos you can deliver stimulus for the classroom activities. This will help you manipulate the need that students have for learning new stuff and it will indeed provide you with an extraordinary value for the entire learning experience.

- **4. Video brings more information**

There's no denying that videos are always filled with information. Not only that, but they do provide the information in an easy to consume, fun manner that you will appreciate and enjoy. That alone helps the learning experience quite a bit.

- **5. Engage learners**

Videos are known to engage and immerse learners. If you do want to have an immersive and engaging learning experience you do need video and you should consider using it in the classroom as fast as possible.

- **6. Integrate the outside world into classroom**

With help from videos you can integrate the outside world into the classroom. That alone makes it very easy for you to create authentic, unique and fun lessons that will immerse your students even more than you would expect.

- **7. More than words can tell**

Videos help create an experience and while words can help with that as well, videos don't have to rely on imagination. They are a lot more immersive and fun, not to mention the end result is a lot more appealing. In the end, that's what makes everything more worth it and you should consider giving it a shot!

- **>8. Videos are more flexible**

Videos are flexible and they do offer a very flexible medium. It really is a great place to work within and it will provide you with an immense value in the long run if you choose to use them as a learning tool.

- **9. Easier to understand**

Research has shown that using videos for learning makes it a lot easier for students to understand various topics and ideas. It's one of the best learning tools that you can use for sure.

- **10. Video creates an experience**

Static information is great but the reality is that with help from video support tools you are free to bring that information to life. It's fun, easy and your students will definitely appreciate the great experience and value they can acquire from this!

CHAPTER 7

VIRTUAL LABS

virtual labs

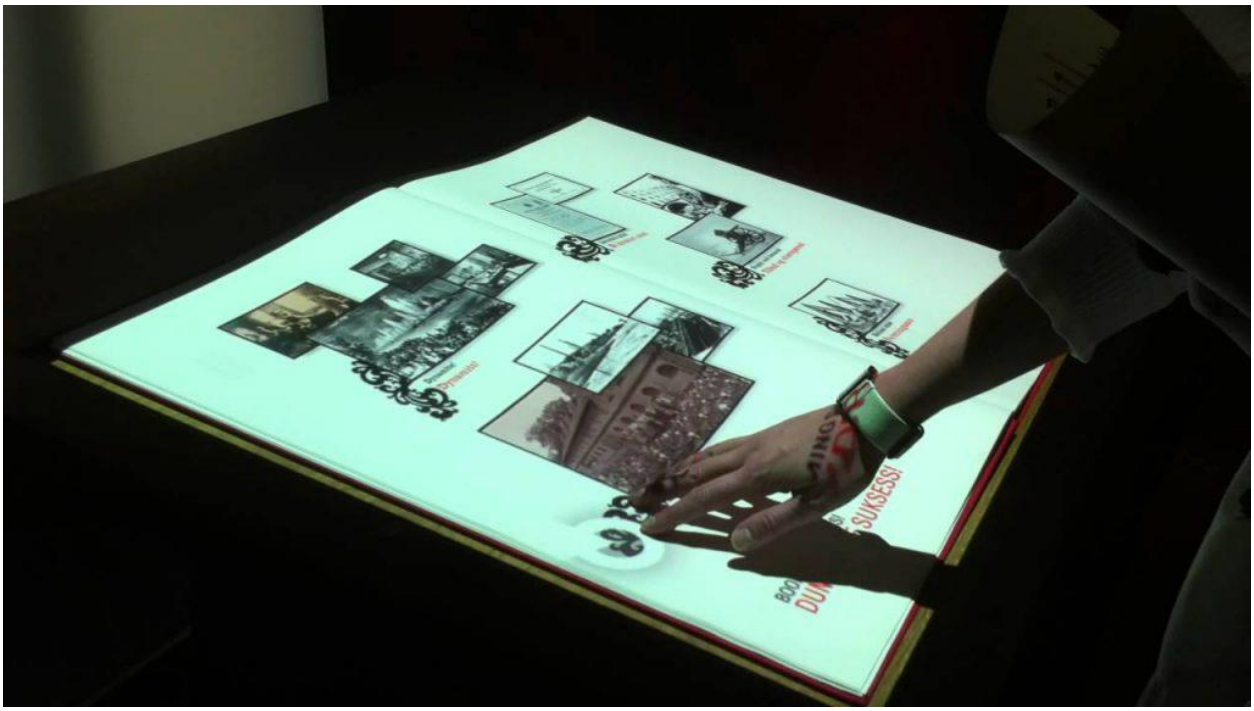
The virtual labs use a teaching method called simulation. The simulation, as defined by Dr. Ali Abdul Samia Quora, is an educational method that the teacher usually uses to bring students closer to the real world. The simulation method is believed to be closer to what is happening in areas that do not accept the lowest percentage of error, such as nuclear industries and some military industries.

Simulation is one of the most important methods of education and training that, trainers rely on to rationalize financial costs and also to rationalize time and effort. The simulation serves many educational objectives such as “goal of acquiring skills” in an environment similar to reality, and also serves the “cognitive goal” as it helps the learner to gain a lot of knowledge about the real work environment and its requirements.

Simulation in Education

After the spread of computers in the mid-nineties of the twentieth century, interest in simulation as an appropriate and effective in the process of education has increased. Simulation has become more effective and exciting in teaching. Simulation languages have varied, and the material losses reduced adding flavor of fun to the educational process. This made the process of laying the foundations for learning some of the difficult topics that can’t be dealt with in real world more effective.

Digital Age and Educational Systems



The tremendous technological growth we witness in various fields, including the field of e-learning, is the most important feature of the information revolution, which created a rapid information network that lead to the calibration of educational systems and study systems. These systems should help students keep up with these developments by providing them with new knowledge and skills. The best way to do this is not only to communicate knowledge to the students, but to teach them how to become creators and innovators, and how to use new technologies to activate their ideas effectively.

Virtual labs and their benefits in e-learning

As a follow-up to the digital age, educational forms and methods have developed. One of these forms is "E-LEARNING." E-learning represents a revolution in traditional educational systems, a revolution that has created new goals in the management of education systems, the nature of learning, the role of teachers, and all aspects of the educational process.

Among the tools used in e-learning is the simulation of real labs, or virtual labs which have many benefits. The student is exposed to a virtual environment similar

to a real physical lab. The virtual lab allows the student to enjoy performing experiments safely and getting results using the computer.

In physical labs, many experiments usually can't be performed in real labs due to time, complexity, difficulty or hazards. In virtual labs, these experiments are simulated. Using the computer we can conduct, study and analyze these experiments under different conditions and variables to know the results of all the conditions of the experiment without fearing material or moral cost.

Classification of simulation programs used in virtual labs

Simulation programs are classified into two types in learning:

1- Decision making simulation:

One program is "What if?" This program is constructed to allow the student to choose the variable. It explains what happens to these variables in different circumstances. The student experiments with the different variables to see their impact on the results without serious risk.

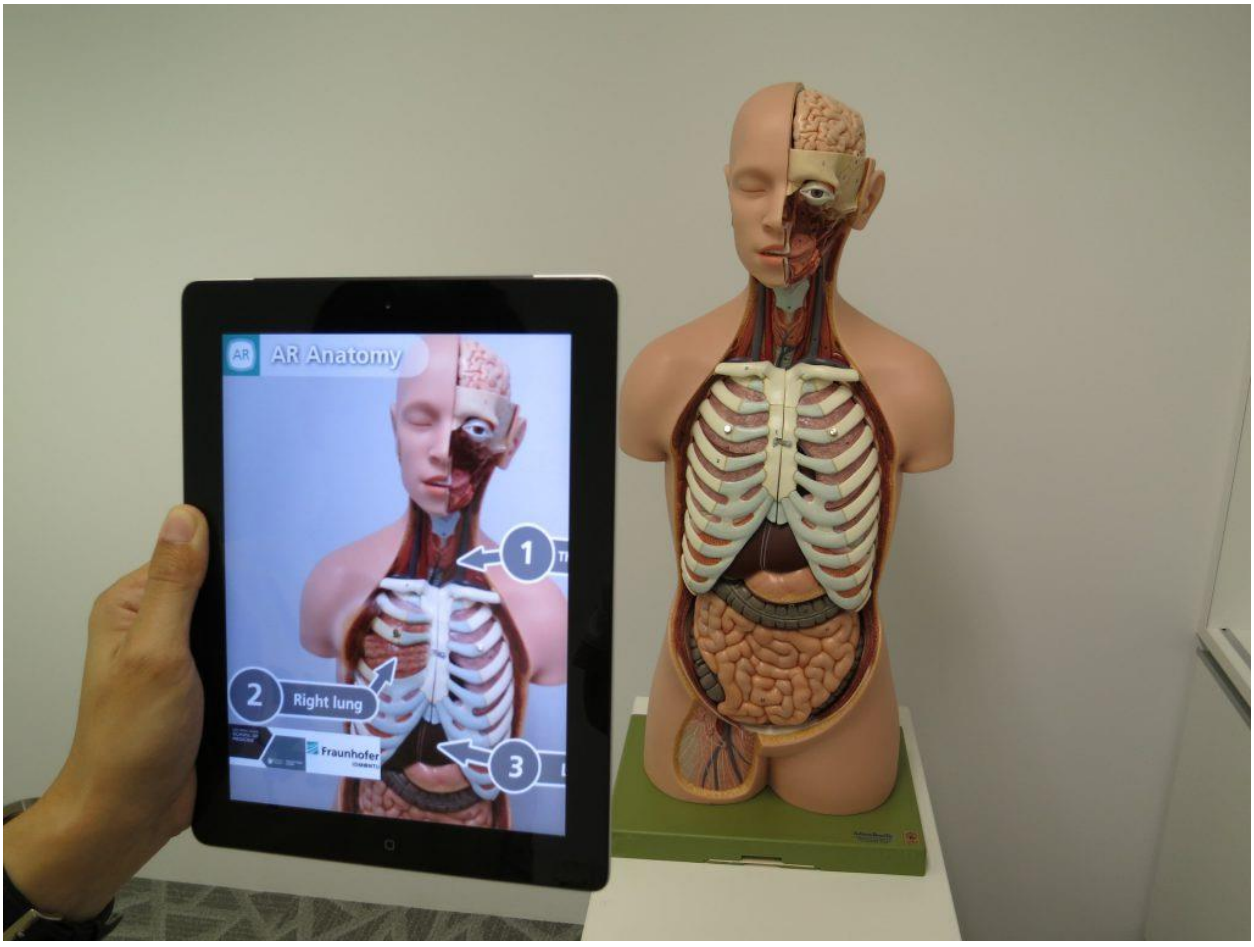
2- Process simulation:

This type shows how any process that requires a set of steps to operate a device is completed. This type of program is highly suited to teach practical skills, especially when it is difficult to perform these skills in the first stages directly, for fear that the operating errors might cause damage to the device.

The study of Joseph P. Akpan (2002) is a case study on using simulations in education, which emerged as a result of the US animal rights associations' demand for the removal of anatomy from the biology curriculum in higher schools, prompting teachers to seek alternative methods of anatomy that could serve the purpose.

The study aimed to measure the effectiveness of simulation using a computer as an alternative to the process of anatomy. Simulation has the ability to teach experiments. However, prior to the study, simulation was used in rare and very serious cases only. The repeated calls by animal rights organizations paid off, pressuring organizations to use simulation in less serious cases such as anatomy.

This study encouraged several project funding organizations to provide schools with such programs to prevent animal cruelty under the name of anatomy.



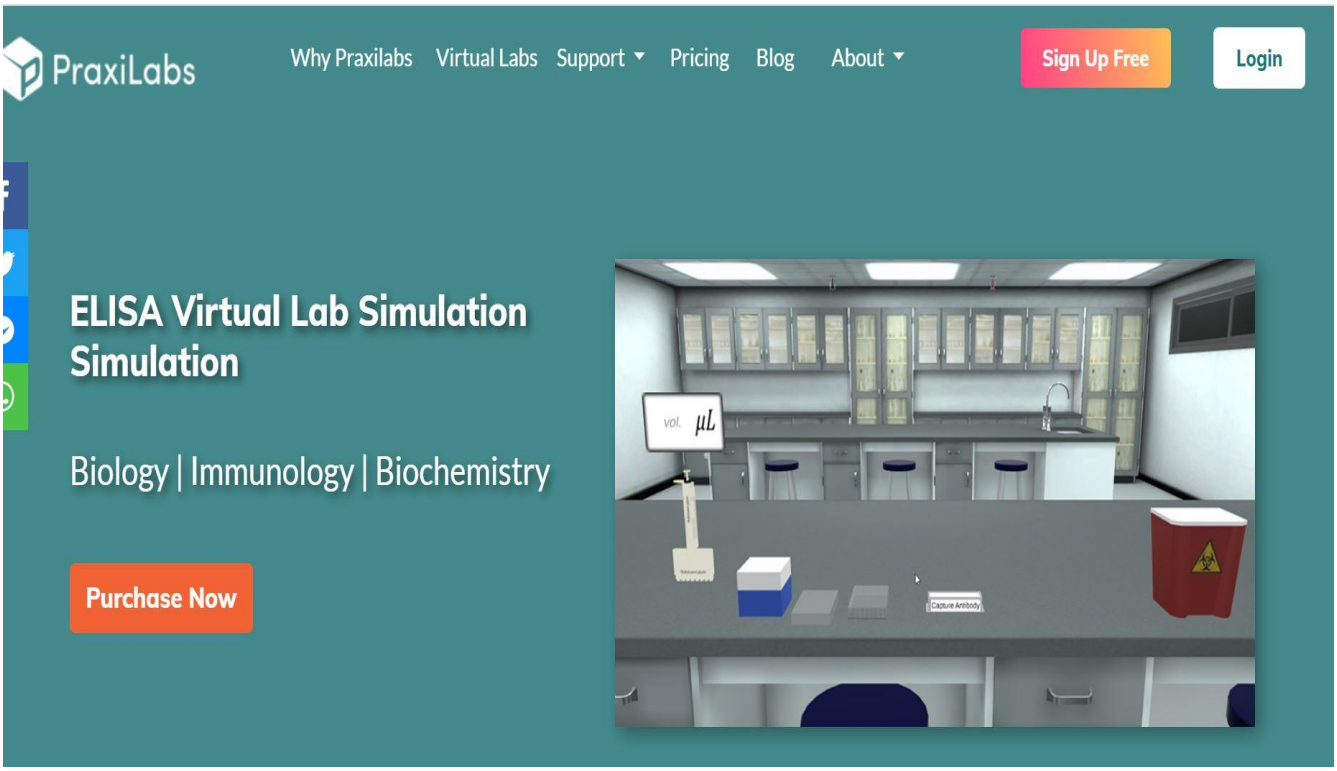
Simulations are also useful in training in various fields of experimental science with the use of 3D models to meet the needs of students and researchers in various fields of science. The simulation program represents the absolute safety of users where errors are detected and processed without the risk of electronic, mechanical, or toxic substances.

Hence, virtual labs that use simulation systems in the design of the ideal reality provide the maximum benefit to the student with minimal effort and less cost to the educational institution to which the student belongs and in a completely secure and high degree of flexibility.

Examples of virtual labs

1. Unrealchemistry

2.praxilabs



3. PhET™ Labs

Build a Molecule

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12.Virtual labs
https://praxilabs.com/en/3d-science-simulations