Chapter 39 Microbes Planet

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Abstract

Advances in Information and Communications Technology (ICT) have been given a tremendous impact in new generations’ life. The implementation ICT or e-Learning is fundamental in modern educational system. Based on research, it is found that learners tend to empower knowledge to become more active, collaborative and productive, by producing sustainable knowledge rather than only consuming. Hence, we create a website called Microbes Planet using a video web-based concept to attract young learners starting from age 11 to learn Microbiology science with variety of educational videos. We also provide Augmented Reality Microbiology notes to educate them about the basic knowledge of Microbiology and to introduce them new concept of creating notes using current technology. We have different tabs which leads to different function in the website. Tab Micropedia elaborate more on the scientific terms and facts about Microbiology according to the level of the students’ capabilities. Level 1 would consist of students age 11-12, level 2 age 13-15 and level 3 for students age 16-18 years. The classification of levels are based on the Ministry of Education in Life Science Syllabus that focus on Microbiology subject where students learn in primary and secondary schools. We also have provided Do it yourself (DIY) section that teach students to do science project at home using household products. By doing this, we would encourage students to be more creative and innovative in learning science and technology.

Introduction

Ever since the Malaysia Ministry of Education has introduced new syllabus and learning system that encourage students to be more IT competence, a website that display a lot of information on science would be the most suitable platform to encourage young learners to explore Microbiology beyond the text book. Since, advances in Information and Communications Technology (ICT) has been given a tremendous impact in this new generation Y and Z, the implementation of ICT or e-Learning in modern educational system is absolutely fundamental to attract new generations to learn Science. Based on research done by E. Tambouris, et al., (2011), studies have found that learners tend to empower knowledge to become more active, collaborative and productive, by producing sustainable knowledge rather than only consuming. Hence, a website called Microbes Planet is created to encourage young learners starting from the age 11 to learn Microbiology with variety of educational videos by using a video web-based concept.

Content

The topics covered in this website is consistent with the Microbiology syllabus in Malaysian Primary and Secondary Science and Biology text book. This website is not just pack with information but there are also interactive videos, quizzes, images, current issues and experiments that able to help students of 11-18 years old to understand more in Microbiology and makes the learning much more fun.
In conjunction with the e-learning trend, this website also introduce Microbiology YouTube channel called MicrobeBuzz comprises of variety of videos such as fun facts, news and real laboratory procedures that students can watch and learn. Students can even ask questions in Contact us section or in our Facebook and Twitter account regarding Microbiology subject. They can also share any ideas on our website by email or personal message in Facebook and Twitter directly to us.

The website consists of three different levels, Level 1 emphasizes on student year 5-6 primary school, Levels 2 and 3 for Form 1-5 and A-level students, respectively. In Level 1, the content would be an introduction to Microbiology and the subtopics consist of types of microbes, morphologies, difference between good microbes and bad microbes and morphologies on agar plates.

The aim for level 1 is to make sure that these students are able to differentiate the types of microbes. Moreover, we also provide reasons why these shapes, sizes and colours are important to know mainly for identification purposes. We explain what Microbiologist in the laboratory do to identify and classify these microbes. Good microbes versus bad microbes are also important for these students to learn because they are able to differentiate the function of microbes and understand the facts of how microbes can be essential in life and not just showing their only pathogenesis or bad impacts in life. In Level 2, the content consists of differences between unicellular and multicellular, sexual and asexual reproduction, food web and relationship between organisms and introduction to microscope and function.

The aim in level 2 is to clarify the students the basic differences between unicellular and multicellular cells and how it is important in classifying these microbes in groups. In addition, this website also explains the characteristics and differences between sexual and asexual reproduction and relate it how microorganisms are more abundance based on their reproduction characteristics. Microbes Planet also provide a brief explanation and videos on the functions of microscope because we want the students to understand how to use the microscope because some school have already prepared all the slides under microscope without giving the chance for students to explore on how to use the microscope themselves. So, this earlier exposure may help them to properly use the microscope before they enter university.

In level 3, the topics focus on differences of characteristics, structure and function between eukaryote and prokaryotes, factors for microbial growth, staining, microscope observation, movement of microbes and finally treatment and prevention of diseases. Level 3 are suitable for audience of upper secondary school and foundation of science or A-level students because the topics covered for microbial cells are more exaggerating and deeper aspects are focused in this microbiology subject. This early exposure is essential to learn at this stage before they planning to have an honours degree in any of the Biology fields.

This website only covers Microbiology topic because student finds this topic hard to study in school and needs to remember a lot of facts. To make this topic interesting and easy to learn, we spice up with the current issues in E-news, DIY section, downloadable mind maps and variety of videos to watch.

In Do It Yourself (DIY) section, this is where students experience to create arts project at home. Using household and recycle materials, students are able to create an art project which the products they produce relates to the Microbiology knowledge that they have learnt. We want to apply deep learning of science in students by involving them to create an artistic product and learn facts about Microbes at the same time. In DIY section, there are videos and blogs that explain in details about the procedure and materials to use. They can read the instruction link to the blog of Microbes Planet and watch YouTube videos with explanation on science and show how exactly we carry out the art project. We want students to enjoy learning science facts and think outside the box.
Fig 1. On the left shows link in the DIY section and on the right is link directly to the Microbes Planet blog.

Fig 2. Above shows a Youtube link video in DIY section where students can watch the explanation videos on the DIY project they will do.

Besides DIY section, we do have game board section that provides an information on the Microbiology game board which students able to experience playing a traditional gameboard with a fusion of 3D Augmented Reality Technology. The Microbes Planet website has collaborate with Microtopia Land game board team to produce a game for students to play while learning and applying their knowledge of Microbiology. In order to play the game, students must first read the Micropedia section to gain knowledge on Microbiology according to their levels. The game board is divided into three levels exactly like the levels divided in the website (Micropedia section). If students would want to play the 3D game board, they have to contact us directly.

**Conclusion**

Website has been an e-learning platform for years as it is easy to use, user friendly and pack of information to students. It is important to encourage students to be IT competence by promoting advance learning of Microbiology beyond the text book using website. The purpose of learning through website is for students to explore Microbiology in world wide web and encourage them to find more information than what have prepared in their text books. It is an alternative way of using technology than only depends on what have written in textbook. The information in the website may also help students to assist their school assignments and projects. Hence, Microbes Planet website providing students with extra Microbiology knowledge and able to facilitate students to learn Microbiology with extra confidence.

**References**
