BIOPharm: A student-created website for the learning of rapid-growing field of biopharmaceuticals

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ABSTRACT – Web-based learning is a valid approach for a relatively new and rapidly growing field of biopharmaceuticals. The current invention is a website consisting of drug guides (i.e. generic name, dose, route of administration, side-effects and precautions) for the top 20 selling biopharmaceuticals in 2017. Students gathered the content of the website from various sources and pooled using education tools such as Padlet and Google Cite. Students can access the website via any portable devices during their clerkship and even after graduating. This approach is believed to be able to enhance the students' learning experience and feeding students with up-to-date information.

1. INTRODUCTION

Biopharmaceutical is a medicinal product derived from biological sources and especially the drugs produced using biotechnology. Biopharmaceutical drugs have been rapidly revolutionised since its introduction in 1982 as compared to the market of all other drugs [1]. They are also dominating the therapeutic options of various chronic diseases, including chemotherapy regimen. Recent advances in the field of biotechnology have facilitated the production of various biopharmaceuticals, which nearly 40 % of the total number of new drugs approved in 2018 [2].

Bachelor of Pharmacy, as of other health care courses, requires the students to acquire up-to-date knowledge on the biopharmaceuticals available in the Malaysian market. Unfortunately, the field of biopharmaceuticals is relatively new and rapidly growing hence, the learning materials are scattered at various sources, and new information is constantly being reported. We reckon that web-based learning is a more valid approach compared to books to feed students with new and valid information from time to time. The website approach also provides the educator with the flexibility to update the content anywhere and anytime which allows continuous production of new content and revise the content time to time at negligible cost. The application of a website as a learning platform could complement the conventional printed books, especially targeting the tech-savvy students of generation Z. Hence, the web-based approach provides the educators and students with a convenient and flexible classroom environment for teaching and learning of biopharmaceuticals.

The current invention is a website consisting of drug information of the top 20 selling biopharmaceuticals in 2017.

2. METHODOLOGY

A total of 116 students from year two (2) of Bachelor of Pharmacy participated in the study. Briefly, the students were divided into 20 groups and each group was assigned to a biopharmaceutical product. Each group gathered information, such as generic name, dose, route of administration, side effects and precautions of the pharmaceutical drugs from various sources in the form of drug material sheet in English and Bahasa Malaysia. This activity aided the students to collect, analyse and summarise the information from various sources, followed sort and sequence them into proper components. The findings were then designed as an infographic for an easy-to-understand and quick reference. These drug material sheets and the infographics were then shared in the Padlet (Figure 1) to validate the content by other groups. Upon the content validation, the materials were presented in Google Cite in the form of a website and the link was shared among the students for their feedback. It should be emphasised that all work was done online, and no hard-copy materials have been involved at any stage of this process.

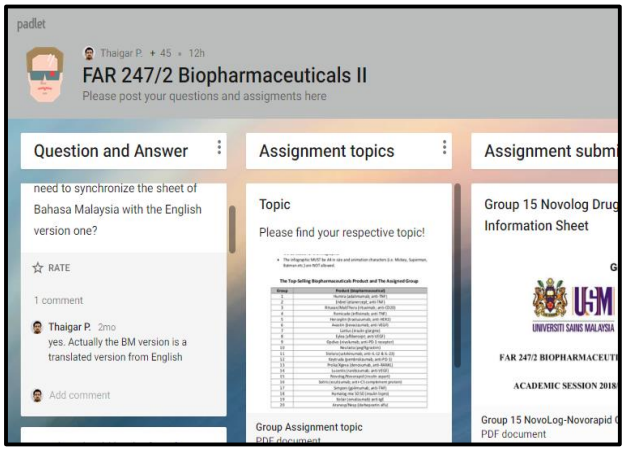

Figure 1 The Padlet wall showing student activity of data collection and validation. The link is https://padlet.com/thaigarp/wy981b2kcjf8.

3. RESULTS AND DISCUSSION

The BIOPharm website can be found at https://sites.google.com/view/biopharmaceuticals/home (Figure 2). This website educates the students on the top-selling biopharmaceutical drugs, i.e. generic name, prescription dose, delivery route, possible side effects or potential interaction with other drugs and precautions of the medication.

The approach of web-based learning to engage

students in the process of active learning is not a new method of learning [3]. However, to the best of our knowledge, there is not a single portal that is collectively providing pharmaceutical guides on various biopharmaceutical drugs. This website could be one of the pioneers. This website will serve as a comprehensive and up-to-date guide of biopharmaceutical drugs. It is presented in a clear and user-friendly manner. We believe it is an ideal tool for students and health care professionals to learn on biopharmaceutical drugs as it can be accessed via computers and mobile phones at any time and from anywhere.

Figure 2 The home page of BIOPharm. The website is consisting of the generic name, dose, route of administration, side effects and precautions of top 20 selling biopharmaceuticals in 2017. The link is https://sites.google.com/view/biopharmaceuticals/home.

On the other hand, the student feedback on the learning activity showed that the majority of the student (73 %) preferred the design and knowledge delivery through web-based learning (Figure 3). Indeed, many commented this approach effectively aid them to learn the biopharmaceutical drugs.

The content of the website will also be updated every year by the future batch of students to accommodate with up-to-date information. Hence, the website has the potential to provide a continuous learning platform for the students.

At the present stage, the website does not have any commercial value. The infographics of the top 20 selling biopharmaceutical drugs will be copyrighted.

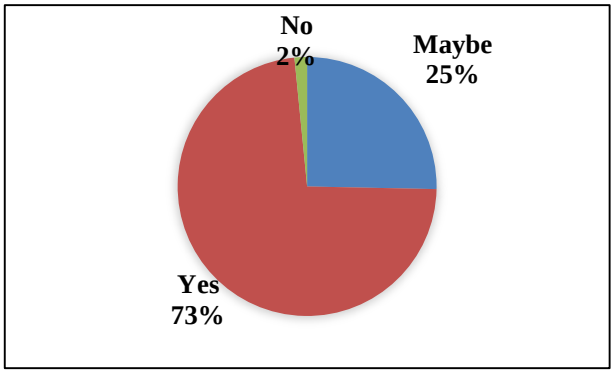

Figure 3 Student feedback if they enjoyed the web-based learning process. The student response was collected as “Yes”, “Maybe” and “No”.

4. CONCLUSION

The BIOPharm website may become a handy option with up-to-date information at a very low cost to educate students and health care professionals with biopharmaceutical drugs.

5. ACKNOWLEDGEMENT

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