INSIGHT JOURNAL

UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR

International, Refereed, Open Access, Online Journal

Volume 3

2019

eISSN : 2600-8564

INSIGHT JOURNAL (IJ)
UiTM Cawangan Johor Online Journal Vol. 3: 2019
eISSN :2600-8564
Published by UiTM Cawangan Johor
insightjournal.my

About

INSIGHT Journal is an international, open access, refereed, online, academic research journal established by Universiti Teknologi MARA Cawangan Johor, Malaysia. It is indexed in MyJurnal MCC.

INSIGHT Journal focuses on social science and humanities research. The main aim of INSIGHT Journal is to provide an intellectual forum for the publication and dissemination of original work that contributes to the understanding of the main and related disciplines of the following areas: Accounting, Business Management, Law, Information Management, Administrative Science and Policy Studies, Language Studies, Islamic Studies (ACIS) and Education.

TABLE OF CONTENTS

INSIGHT JOURNAL
Universiti Teknologi MARA Cawangan Johor

INSIGHT JOURNAL Volume 3
Published by UiTM Cawangan Johor, Malaysia
eISSN 2600-8564

Creative Writings in Preparing Undergraduate Pharmacy Theses

Ibtisam Abdul Wahab [1] and Hannis Fadzillah Mohsin [2]

[1]Associate Professor, Department of Pharmacology & Chemistry, Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Bandar Puncak Alam, Selangor Darul Ehsan
ibtisam@puncakalam.uitm.edu.my

[2] Senior Lecturer, Department of Pharmacology & Chemistry, Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Bandar Puncak Alam, Selangor Darul Ehsan
hannis@puncakalam.uitm.edu.my

Abstract

Creative writing in preparing undergraduate pharmacy theses is necessary when students assimilate their knowledge in retail pharmacy by transcribing their experiences and understandings of the herbal products, after the attachment training. It is firstly anticipated that most herbal consumers are not mindful to the botanical designations of those species. Therefore, the students need to describe natural sources with the local descriptions. In their proposals, the literature would cover the scientific explorations of that native plantarum. Then, the students would be able to relay the information to the public, after extensive readings in Semester Five. Fortunately, some foreign plant samples are not difficult to be investigated, due to their accessibility in the outlets. Nevertheless, the challenges are more concentrated on the modern therapeutic applications of those herbs, as compared to their utility in traditional practices. In Semester Six, the undergraduates' examinations would involve the laborious analysis of the extracts, since the ingredients are the active compounds, biosynthesized in plants. The thesis would include the write-up of their communication with the community, regarding the feedback of the current affairs in nutraceutical and pharmaceutical industries. Finally, the students' creativity could be enhanced, when they are required to refer to various resources, in addition to the scientific journals and chemical databases. This includes referring to the holy text while studying the prophetic herbs and custom medicines. In summary, it is believed that creative writings and appraisals are essential in the teaching and learning process and are significant in the career development of the future pharmacists.

Keywords: creative, pharmacy, research, undergraduate, thesis

1. Introduction

The pharmacy undergraduates are offered research subjects in their third year of the curriculum, via two research courses. The first course is for the students to present a literature search and propose a suitable method for their topic and research samples. In the next course, the students will be asked to execute the methodologies, with the guidance from their lecturers/supervisors. An introduction to agropharmacy is also given in this course. This area could incorporate both agricultural and medicinal knowledge that encompass the information on quality herbal plantation and harvesting of natural resources for retails and pharmaceutical purposes. The Faculty of Pharmacy, Universiti Teknologi MARA, also holds several activities to introduce agro and community pharmacy to the students. These activities include the following: -

a) a visit to the Malaysian Agricultural Research and Development Institute (MARDI) research station at Kuala Linggi, which cultivate lemon myrtle (*Backhousis citriodora*)

INSIGHT JOURNAL Volume 3
Published by UiTM Cawangan Johor, Malaysia
eISSN 2600-8564

for the extraction process to produce the essential oil. Such a visit could also be co-organised for pharmacognosy lessons in Semester Five.

b) an educational trip to the horticultural exhibition (e.g. Malaysia Agriculture, Horticulture & Agrotourism Exhibition or MAHA).
c) an individual visit to agrotourism site, e.g. Lavender Garden at Tringkap, Cameron Highlands, Pahang.
d) a review on the utilisation of the medicinal plant among Malay practitioners, e.g. the traditional midwives in the North of Peninsular Malaysia.
e) a yearly attachment to the community pharmacies nationwide (in Semester Five), among other academic purposes, to observe the marketable goods which include halal herbal ingredients.
f) an introduction to the scientific methodologies, such as liquid chromatography, to investigate the chemical constituents of the herbal extracts.
g) an annual industrial attachment at the traditional massage oil manufacturer (in Semester Six), which utilise natural sources such as the fragrant screw pines (*Pandanus* species).

2. The Research Courses

The research courses should possess specific aims, in order for the lecturers and students to gain the benefits from the teaching and learning processes (Albon, 2014). By the end of these courses, the students are able to;

1) discuss the research questions in their study.
2) understand the research objectives and the research hypotheses.
3) understand the methodology or the research outline.
4) choose a suitable statistical technique, if applicable.
5) construct the thesis structure.
6) improve language, writing, presentation and communication skills.
7) develop ideas and propose formal research.

Several hypotheses are made in order to anticipate the key points for the organization of the research course. The hypotheses would include the following.

Hypothesis 1: Lecturers could play a major role as research supervisors.
Hypothesis 2: The herbal plants could be introduced by reviewing the literature and performing the research.
Hypothesis 3: Lecturers and students could increase the knowledge by the research courses.
Hypothesis 4: Community and industrial training could educate future pharmacists.
Hypothesis 5: The accomplishment of undergraduate research projects could be linked to the knowledge from the pharmacy attachments.

The research courses are designed by the resource persons or coordinators of the course. This person is commonly the lecturer who is able to propose the plan to the academic board members, as shown in Figure 1.

INSIGHT JOURNAL Volume 3
Published by UiTM Cawangan Johor, Malaysia
eISSN 2600-8564

Semester	Third Year of PH240 Bachelor of Pharmacy (Hons.) program																									
	Sep – Jan Academic Semester													Break	Mac – June Academic Semester											
Weeks	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Literature search	✓	✓	✓	✓			✓	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓	✓	✓			✓	✓	✓
Visits and Community Attachment							✓	✓							✓									✓	✓				
Research Proposal Presentation													✓	✓															
Laboratory Work																✓	✓	✓	✓	✓	✓	✓	✓						
Data Analysis																		✓	✓	✓	✓	✓	✓	✓	✓	✓			
Thesis Writing																				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thesis Defence																												✓	✓

Figure 1 The research course plan for UiTM pharmacy undergraduates.

This plan is important in order to provide a time-based plan with regards to the students' tasks during their research work. Their responsibilities include performing the literature review (Boland et al., 2014) on the specific medicinal plant, followed by the sample extraction and the utilization of laboratory instruments for the respective extracts. During the semester break, or while doing their industrial training the students may perform a survey or conduct interviews e.g. the utilization of *Pandanus* among the traditional practitioner or the midwives at the north of Peninsular Malaysia. The scientific data need to be analysed before the thesis is presented. The thesis will be evaluated by the lecturer or the research supervisor, having similar pharmacy discipline.

2.1 Outlining the Research Course with Focus on Herbal Projects

Pharmaceutical chemistry research discipline would involve the investigation of medicinal (Morral, 2015) and herbal plant (Harrold & McFalls, 2010). The incorporation of traditional and complementary practices with current knowledge on herbs is made possible through the research course. For example, in the selection of herbal samples, both Ayurvedic and research perspectives (Katiyar, 2019) were explored through literature search and critical readings. The initial step is the offering of a list of potential herbal topics to a group of students in their fourth semester, especially those who are interested in the chemistry subjects e.g. during dedicated mentor-mentee gatherings. The herbal samples would include local and western herbs, which might be available from retail outlets. In the beginning of their fifth semester, the students can suggest their research materials, either from their supervisor's list or their own personal interest. The students are allowed to bring natural plants from home or organize their own sample collections, due to the availability of samples e.g. keriang and sungkai (*Syzygium* and *Peronema* species, respectively). The making of the research proposal might also include the pharmaceutical or nutraceutical products which are based on chosen herbs e.g. roselle or *Hibiscus sabdariffa*. The integration of community practice with writing a research proposal and thesis making is also practicable through the research course. The understanding of the drug source could be enhanced among the students (Harrold, 1998; Alsharif et al., 1999). For example, specific traditional herbs like the star anise pods, contain *trans*-anethole, which is a precursor for an antiviral drug. At this point, herbal monographs (Malaysian Herbal Monograph Committee, 2013; Mazura, 2016) could be introduced, where the topics of cinnamon and *Vitex* were chosen.

Next is the research laboratory period, which is the crucial time for the students to apply the chemistry concepts e.g. the acid-base reactions, the polarity of the compounds and solvents.

INSIGHT JOURNAL Volume 3
Published by UiTM Cawangan Johor, Malaysia
eISSN 2600-8564

The outline for the research course, with a special focus on the herbal projects, would consist of plant sample extraction. The importance of solvent polarity in determining the types of extractable natural products is given. For example, alcoholic extraction would provide phenolic-rich fraction. On the other hand, hexanoic extraction could offer lipid-soluble components such as the plants' steroidal constituents.

The purification of natural compounds is taught during the chromatography lessons. The structural elucidation of the isolated compounds is achieved via spectroscopic methods. The introduction to instrumentation, e.g. automated high-performance liquid chromatography for the chromatographic profiling was made. For example, the secondary metabolites from *Pandanus* extracts were detected during the final year project. In addition, high field Nuclear Magnetic Resonance (NMR 500 MHz) spectroscopy is utilized in the course of structural elucidation of the natural compounds and its regioisomers from *Curcuma* extracts (Ashraf et al. 2017). The research course is also able to instil care to animals with the inclusion of knowledge in veterinary science. For example, the research on plant sample, used as catnips. The outline for the research course could include both the proposal and thesis defence. There are opportunities for the students to present their research outcomes (Nozula et al., 2017; Samsul et al., 2018).

2.2 The Theses Writings

Creative writing in preparing undergraduate pharmacy theses could be needed when the students assimilate their knowledge in retail pharmacy by writing their experience and understanding of the nutritional and herbal products, while in community attachment (Jarvis et al., 2004). The botanical names of the medicinal plants are not common to the public; therefore, the students would have to be able to describe the herbs with their local descriptions. For example, the local plants such as the roselle, pomegranate, chaste tree and curcumin, were chosen for the topics of study. Meanwhile, the Western herbs, for instance, the lavender, oregano, and black cumin were selected for further investigations (Table 1).

The literature review covered the scientific explorations of the native plants, for example, the *Hibiscus*, *Punica*, *Vitex* and *Curcuma* species. The students would be able to relay the information to the public. The foreign samples were also not difficult to be studied, since rooibos tea, *Lavandula*, *Origanum*, *Rosmarinus* and *Nigella* were locally available in the retail outlets. Nevertheless, the challenges are more concentrated on the therapeutic application of those herbs, as compared to their uses in traditional practices. Their main examinations would be the analysis of those plants since the ingredients are the active chemical compounds, synthesized naturally by the plants (Joubert & de Beer, 2011). There is a section of the thesis writing, where the students have to communicate with the community in order to gain more information about the current affairs. Their creativity would be enhanced, when they need to refer to other references, in addition to the scientific journals (Loukas et al., 2010). For instance, they would be able to refer to the Holy Quran ('Ali, 1999; Yusof, 2017), when studying the pomegranate and the olives, both are the examples of prophetic medicines.

INSIGHT JOURNAL Volume 3
Published by UiTM Cawangan Johor, Malaysia
eISSN 2600-8564

Table 1: Selected herbal plants and their commercial products.

Local herbs	Products	Western herbs	Products
Aloe (*Aloe vera*)	Aloe gel and shampoo	Black cumin (*Nigella sativa*)	Seeds and oil capsules
Chaste tree or lemuni (*Vitex trifolia*)	*Vitex* menstrual pills	Juniper (*Juniperus* species)	Juniper oil
Cinnamon (*Cinnamomum* species)	Cinnamon sticks for aromatherapy and herbal tea	Lavender (*Lavandula angustifolia*)	Lavender oil and soap
Curcumin (*Curcuma longa)*	*Curcuma* tablets	Olive (*Olea* species)	Olive oil
Garlic (*Allium* species)	Garlic tablet and oil capsules	Oregano (*Origanum* species)	Oregano oil
Pomegranate (*Punica granatum*)	Pomegranate juice	Rooibos (*Aspalathus linearis*)	Red tea
Roselle (*Hibiscus sabdariffa*)	Roselle toothpaste, juice and pickles	Rosemary (*Rosmarinus officinalis*)	Rosemary oil
Mint (*Mentha* species)	Mint gum, toothpaste, and mouth rinse	Saffron (*Crocus* species)	Saffron filament, tea and oil

3. Discussions

The students are concerned about the Cumulative Grade Point Average (CGPA), as the measurement for their performance. The “problem-solving skills and scientific thinking” are two of the attributes for generating the “spider web” matrix in displaying the iCGPA (Integrated Cumulative Grade Point Average), which is currently not compulsory in Malaysian public universities. The offering of these research and practical courses could help the students in achieving appropriate CGPA (Mohd Zahari et al., 2017). Nevertheless, the undergraduates normally do not have any hint about a project, let alone write a research proposal. This is due to their lack of knowledge and experience. Therefore, the lecturers should act as the research supervisors to guide the students searching for creative ideas independently (Sims & Swenson, 2001), proposing theories and presenting the evidence though scientific applications.

The students are also required to enhance their communication skills, increase their self-esteem and boost their own confidence. Simultaneously, the research course could also satisfy the lecturers’ individual aspiration. This is due to the fact that the idea or research topic was firstly thought by the lecturers themselves, before it was offered to the learners. Therefore, this matter could become such a personal issue, and soon, could develop into a complicated and private matter between the lecturers and the students. On the other hand, there could be an incidence of students having the fear of the lecturers’ assessment, which could affect their CGPA. In such situations, the students put their efforts into the research courses, to satisfy their lecturers and/or supervisors. Therefore, the lecturers are prone to award relatively higher scores for the thesis writings. The opinions from other laboratory mates are also considered influential, should the data collection be made in groupings. The students’ point of view may not be valid and thus, rejected by the lecturers. However, as the situation is encountered, communication is continuously improved. Such interactions could include applying free

WhatsApp messaging, electronic mails, sending short messaging via network services, individual coaching, group discussions and presentation rehearsals (Sharma et al. 2004; Cetinkaya, 2017).

4. Conclusions

This paper describes the practices in teaching and supervising the Bachelor of Pharmacy undergraduates for their pharmaceutical chemistry related projects and thesis writing. In the course outline, supervisions include guiding the pharmacists in designing a research proposal and performing the laboratory techniques. The students are introduced to the fundamental of scientific methodologies and systematic, intellectual thinking, via the research courses. These courses would initiate basic and rational thinking, in addition encouraging the students to ponder on things such as natural products or plants, besides their normal and personal daily routine.

The research course could also provide important analytical methods for students to write their research articles. When conducting the research, time limit is normally used by the students. This is due to various demands and schedules from other courses. They are also required to be at the teaching hospitals for their clinical subjects. The pharmacy undergraduates in Semester Five are involved in proposal writings. When they reach Semester Six, they will need to realize their proposals by performing certain experimental procedures, write and defend the thesis. After the completion of the research course, the students will be asked to submit the hardbound versions of their research work in Semester Seven. After the research modules, the students are encouraged to join industrial training. This program is arranged before their clinical and hospital training, in their final year of the pharmacy syllabus. The training sites would include pharmaceutical manufacturers and traditional herbal makers. These locations would possess the standard procedures for producing medicinal, nutraceutical, health and food products, tablets and capsules. Finally, it is hoped that these educational activities would encourage high quality, mature and professional pharmacists.

Acknowledgments

The authors would like to thank the Faculty of Pharmacy, UiTM for its support.

References

'Ali, A. Y. (1999). The Meaning of the Holy Qur'an, Tenth Edition, Amana Corporation, USA.

Albon, S. P. (2014). Role and status of the basic pharmaceutical sciences in pharmacy education: A case study of the UBC BSc (Pharm) program. Unpublished doctoral dissertation, The University of British Columbia. Retrieved from http://circle.ubc.ca/handle/2429/46356, 13th February 2019.

Alsharif, N. Z., Destache, C. J. & Roche. V. F. (1999). Teaching Medicinal Chemistry to Meet Outcome Objectives for Pharmacy Students. Am J of Pharm Educ., 63: 34 - 40.

Ashraf, K. & Sultan, S. (2017). A comprehensive review on Curcuma longa Linn.: Phytochemical, pharmacological, and molecular study. International Journal of Green Pharmacy, 11 (4) (Suppl), S671 - S685.

Boland, A., Cherry, G. & Dickson, R. (2014). Doing a Systematic Review: A Student's Guide, SAGE, UK.

Cetinkaya, L. (2017). The Impact of Whatsapp Use on Success in Education Process, International Review of Research in Open and Distance Learning, 18(7), 59 – 74.

Harrold, M. W. (1998). The importance of functional group chemistry in the drug selection process: a case study. Am J Pharm Educ., 62: 213 - 218.

Harrold, M. W. & McFalls, M. A. (2010). A Pharmacy Practice Laboratory Exercise to Apply Biochemistry Concepts. Am J Pharm Educ., 74(8), Article 144.

Jarvis, C., James, V. L., Giles, J., & Turner, C. J. (2004). Nutrition and Nurturing: A Service-Learning Nutrition Pharmacy Course. American Journal of Pharmaceutical Education, 68 (2), Article 43.

Joubert, E. & de Beer, D. (2011). Rooibos (Aspalathus linearis) beyond the farm gate: From herbal tea to potential phytopharmaceutical, South African Journal of Botany, 77(4), 869-886.

Katiyar, C. K. (2019). Ayurvedic Pharmaceutics, Manufacturing Processes and Novel Drug Delivery Systems in Ayurveda. In: Rastogi S. (eds) Translational Ayurveda, Springer, Singapore.

Loukas, M., Saad, Y., Tubbs, R. S., Shoja, M. M. (2010). The heart and cardiovascular system in the Qur'an and Hadeeth. Int J Cardiol., 140(1), 19-23.

Malaysian Herbal Monograph (2013), Volume 3, Malaysian Herbal Monograph Committee (Editor), Publisher: Forest Research Institute Malaysia.

Mazura, M. P. (2016). Medicinal Forest Species in FRIM, Volume 1, Forest Research Institute Malaysia, Kepong, Selangor Darul Ehsan, Malaysia.

Mohd Zahari, M. S., Hanafiah, M. H. & Hemdi, M. A. (2017). ICGPA as an Integrated Grading System: A Qualitative Study. The New Educational Review, 49(3), 167-175.

Morral, J., Culshaw, M., Morral, K., Conway, B., Adams, S. & Adams, A. (2015). Linking a Pharmaceutical Chemistry Workshop to Pharmacy Practice. Sci Pharm., 83: 125–142.

Nozula, M. F., Mohsin, H. F. & Abdul Wahab, I. (2017). Research on Punica Granatum Linn., Journal of Advanced Research in Materials Science, 30 (1), 1-9.

Samsul, F. N., Abdul Wahab, I. & Mohsin, H. F. (2018). Detecting Fatty Acid Methyl Ester in Sterculiaceae, Malaysian Journal of Analytical Sciences, 22(2): 358 – 364.

Sharma, R., Verma, U., Kapoor, B. & Chopra, V. S. (2004). Novel Teaching Approaches in Pharmacology, 6(3), 172 – 173.

Sims, S. L. & Swenson, M. M. (2001). Preparing Teachers and Students for Narrative Learning. Journal of Scholarship of Teaching and Learning (JoSoTL), 1(2), 1 – 14.

Yusof, K. S. (2017). 'Ibrah Juz 'Amma, page 172 – 179, Muassis Resources, Selangor Darul Ehsan, Malaysia.

INSIGHT JOURNAL

UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR

International, Refereed, Open Access, Online Journal

Volume 3

2019

eISSN : 2600-8564