

***Leveraging Online Databases to Enhance Australian International Students'
Academic Skills: A Case of Gapminder***

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The IAFOR International Conference on Education – Hawaii 2018
Official Conference Proceedings

Abstract

The academic adaption in the university context has become a challenge facing the international students in Australia (Yu & Wright, 2016). To date, a number of students have experienced 'academic shock' (Savic, 2008) as they may initially lack of appropriate academic skills as well as proficiency in the English language to adapt to the new education system in Australia. This study investigates the development of Australian international students' academic skills by employing the Gapminder, an open online database, to achieve one milestone set by the subject of International Perspectives. A total of 100 international students from one Australian university completed an online survey. It is noted that the Gapminder could facilitate the development of international students' research skills, critical thinking skills, English reading and writing skills and cultural awareness that could benefit their future study in the university. Data also indicated that the students showed their interests in the Gapminder, which assisted them completing the assigned assessments and enhancing their academic skills, particularly in collecting and analyzing data as well as researching trends. It is implied that leveraging appropriate online databases could help international students enhance both academic skills and English language competence, better facilitating them to adapt to the teaching and learning in Australian universities.

Keywords: Gapminder, online databases, international students, academic skills

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Introduction

International education has ranked the third place in export in Australia that generated \$20.3 billion income in 2015-16 (Universities Australia, 2016). Followed by the US and the UK, Australia has become the third most popular destination for international tertiary students, which hosted up to 8% of all international students pursuing their tertiary education abroad in 2014 (Australian Government, 2016). In 2015-16, Australian universities and other tertiary institutions generated \$13.7 billion export income from international education (Universities Australia, 2016). It is reported that currently, 24.3% of the students enrolled in Australian universities are international students (Australian Education Network, 2018), and around 32% of the higher degree research students are from overseas in 2014, particularly in the subject areas of engineering and information technology (International Education Association of Australia, 2017).

Students pursuing higher education abroad can access educational resources or courses unavailable in their home countries, enhance their linguistic competence and enrich cultural experiences (Yu & Wright, 2016). On the other hand, hosting international students adds cultural diversities to the university profiles except for the financial contributions to the universities' development (Li, Chen & Duanmu, 2010). However, international students are identified as a heterogeneous group with diverse characteristics (Due, Zambrano, Chur-Hansen, Turnbull & Niess, 2015) as they come from different cultural backgrounds and have complex motivations in learning (Rizvi, 2010). This vulnerable group of students encounter a range of challenges when they adapt to the new environment abroad (Sherry, Thomas & Chui, 2010).

Yu and Wright (2016) argue that international students studying in Australian universities encounter academic barriers and face the challenge of academic adaptation to the local education context. The international students' academic adaptation problem includes lacking English language proficiency, having difficulty in meeting the deadlines of assessments, and being unfamiliar with different assessment systems (Alavi & Mansor, 2011; Mustapha, Rahman & Md. Yunus, 2010). Being exposed to a new teaching and learning system when they start their study in Australia, a number of international students may struggle to adjust themselves to the local education environment that could be significantly different from their learning experiences in their home countries, particularly the students from the Asian countries (Yu & Wright, 2016). It may take the students a long period of time to adapt to new teaching and learning system and overcome the 'academic shock' in the learning process (Savic, 2008).

The existing literature has raised the issue of international students' lower proficient English language level that led to their poor academic achievements in learning (Li, Chen & Duanmu, 2010). As the international students in Australia keep a low proficiency in English language and lack of English language skills, they struggle with their academic reading, writing and oral presentations in teaching and learning (Yu & Wright, 2016), which could often be caused by the students' prior experiences of learning English in a teacher-oriented classroom (Sawir, 2005).

Another challenge facing the international students in Australia is the learning style applied in learning (Lu, Le & Fan, 2012). Australian universities apply self-directed

learning, classroom-based discussions and an emphasis on critical thinking and writing in the education practices (Wang, Andre & Greenwood, 2015), which appear to be more student-centered. A number of international students have experienced an entirely different education system, lecture style, assessment system as well as the relationship between students and lecturers (Savic, 2008). The international students are required to change their learning styles to be self-directed learners to adapt to the teaching and learning environment in Australia.

With the development of the technologies, more current technologies have been introduced and employed in education. The integration of current technologies and digital resources into the teaching and learning have changed the predominant pedagogy of teacher-led to student-oriented (Hubbard, 2006; Levy, 2009). Employing recent technologies and appropriate digital resources in teaching and learning could effectively enhance the learners' English language competence and academic capacities (Yuan, Shen & Ewing, 2017).

To date, there have been few studies focusing on utilizing the recent new technologies and online digital resources to scaffold the international students to enhance academic skills to adapt to the new education system. This study aims to fill in this gap by investigating the development of international students' academic capacities by employing Gapminder, a free online database, to achieve one milestone set by the subject of International Perspectives in an Australian university. The key research questions examined in this study are:

- 1) How do the international students perceive Gapminder in terms of their academic skills development?
- 2) What skills have the international students improved with the support of Gapminder to complete the assignment?

Subject: International Perspectives

The subject: International Perspectives introduces the concept of Globalization and examines the issues and challenges facing the society from a range of viewpoints, including cultural, economic, social, environmental and political. The study of Globalization requires a pluralistic approach to analyze past and present processes taking place in multiple domains. One of the assessments of this subject requires the student to use Gapminder World to investigate the development in the student's home country over time. It aims to develop the students' data analysis, research, writing and presentation skills. Gapminder provides free teaching resources and reliable statistics, fighting misconceptions about the global development and making the world understandable (Gapminder, 2018). It is a fact tank and develops data visualization tools, allowing people to explore a vast number of global statistics.

The students are required to use the Gapminder to examine the data of 'life expectancy' and 'GDP' of the development of their home countries since 1900 and decide at least three dramatic changes of the two variables during that period of time. They need to use academic sources to research historical events that may cause these dramatic changes and try to find out the evidence of the impacts of Globalization on the country's trail of development. A 600-word academic essay needs to be prepared to report the findings of the students' research.

Method

Participants

A total of 100 international students enrolled in the first-year study in an Australian university were invited to participate an online survey. They were aged from 17 to 25 years old. All participants completed their study of the International Perspectives subject and were informed of the aims and the process of this study by the researchers prior to the commencement of the data collection. All the students showed their interests and commitment to complete the online survey. Among the participants, 67 came from East Asian countries (e.g., China, Japan, South Korea, Mongolia, etc.), 20 were from South Asian countries (e.g., India, Nepal, Bangladesh, Pakistan, Sri Lanka, etc.), 11 came from Southeast Asian countries, (e.g., Cambodia, Indonesia, Laos, Myanmar, Malaysia, Philippines, etc.), and two were from other countries.

Online survey

The online survey designed for this study consisted of four multiple choice close-ended questions, 10 Likert-type questions, two ranking questions and one open-ended question to examine the international students' perceptions and experiences of using Gapminder to enhance their academic skills in learning in the Australian university context. Ten Likert-type questions with five-point multiple choice answers range from: 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree. Sample Likert-type questions employed in the study were: *Gapminder is a useful tool to retrieve relevant research data*; *Gapminder facilitates me to enhance my critical thinking skills*; *Gapminder assists me develop my data collection and analysis skills*. The raw statistical data collected from the multiple choices and Likert-type questions were grouped and transformed into tables reporting frequency counts. The qualitative data collected from the open-ended question in terms of the students' understandings of the usefulness of Gapminder in completion of their assignment writing were compared, contrasted and reported in corresponding themes, and the overlapping data were removed so as to avoid redundancy.

Results and discussion

The frequency data from the online survey are presented as follows. Table 1 displays the international students' understandings of the application of Gapminder in research data collection and their research skills development. The participants demonstrated their positive attitudes towards Gapminder regarding collecting relevant research data for the specific research purpose and facilitating the development of their research skills. Up to 85% of the students agreed that Gapminder was a useful tool to retrieve relevant research data and introduced research skills, and 77% of the participants believed that Gapminder could provide a large number of valid and reliable data. Nearly four-fifths of the participants were able to use Gapminder to retrieve the required data and believed that Gapminder assisted them developing the skills of collecting and analyzing research data.

Table 1. Application of Gapminder in data collection and research skills development

Statement	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	Mean
S1	4.00%	2.00%	10.00%	60.00%	24.00%	3.98
S2	3.00%	4.00%	8.00%	53.00%	32.00%	4.07
S3	4.00%	3.00%	16.00%	53.00%	24.00%	3.91
S8	3.00%	3.00%	15.00%	52.00%	27.00%	3.97
S9	4.00%	4.00%	12.00%	54.00%	26.00%	3.94

S1: Gapminder introduces research skills (e.g., data collection and analysis).

S2: Gapminder is a useful tool to retrieve relevant research data.

S3: Gapminder provides a large number of valid and reliable data for the research purpose.

S8: I am able to use Gapminder to retrieve the required research data.

S9: Gapminder assists me developing my data collection and analysis skills.

Research skills, particularly the data collection and analysis skills, are the important skills that the university students have to obtain, which, to a great extent, ensure the academic success in their study. In Australian universities, the students are engaged in a range of research projects in different subjects. They need to well develop their research skills to complete the projects and satisfy the requirements set by each subject. As the international students come from a different education background, they are not familiar with the application of empirical research in Australian education system. This is one of the academic culture shocks that the international students may experience and suffer from, particularly to the students from the Asian background (Li, Chen & Duanmu, 2010). As almost all of the participants of this study came from Asian countries (98%), they must have experienced the academic shock of retrieving and using research data in the study. The data suggest that Gapminder has been recognized as a reliable online database providing relevant research data for specific research purposes. The users can enhance their data collection and analysis skills via using Gapminder to retrieve the required research data.

Except for the research skills, other skills as English language skills and critical thinking skills also play decisive roles in achieving the academic success (Parsons, 2010; Sovic, 2008). Data show that over half of the participants admitted that Gapminder helped them enhance their English language skills (58%), particularly in the development of reading and writing skills. Over two-thirds of the students reported that Gapminder assisted them developing their critical thinking skills (67%) as well as cultural awareness (71%).

Table 2. Application of Gapminder in learning skills development

Statement	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	Mean
S4	6.00%	7.00%	29.00%	42.00%	16.00%	3.56
S5	5.00%	5.00%	23.00%	48.00%	19.00%	3.71
S6	4.00%	4.00%	21.00%	47.00%	24.00%	3.84
S4: Gapminder helps me develop my English language skills, reading and writing skills in particular.						
S5: Gapminder facilitates me to enhance my critical thinking skills.						
S6: Gapminder assists me in enhancing my cultural awareness.						

Language obstacle is the most obvious and biggest obstacle for those whose first language is not English to adapt to the educational setting in an English-speaking country (Sovic, 2008). Though the international students have achieved the competent level in IELTS (The International English Language Test System) Test, such scores do not guarantee the success in their study. Studying in a university requires the students to articulate their learner English to the proficient user English that can facilitate them to adapt to the new teaching and learning environment (Shen & Yuan, 2013).

Additionally, language and culture are tightly interwoven and neither should be studied in isolation from the other (Ahearn, 2001). It is important for the international students to enhance their cultural awareness not only to scaffold their English language learning (Yuan, 2014) but to well adapt to educational and social settings (Nieto & Booth, 2010). It is noted that the Gapminder can facilitate the development of the students' English language reading and writing skills as well as the cultural awareness as they are required to work out the evidence of the developing trends of their home countries and the impacts of globalization to complete the assigned research tasks.

The research projects require the students to apply their critical thinking skills to examine the specific perspectives within certain areas. These are the essential skills that ensure the students' academic success in the university (Yu & Wright, 2016). The students were found to be able to enhance the critical thinking skills by using Gapminder to track the dramatic changes of the two variables of 'life expectancy' and 'GDP' in the students' home countries over the past 100 years. Table 3 demonstrates the rankings of the five skills that the students have improved after using Gapminder to complete the assignment writing. It is found that the students have improved data collection skills most, followed by English writing skills, critical thinking skills, data analysis skills and literature review skills.

Table 3. Improved skills after using Gapminder to complete the assignment writing

Skills	1	2	3	4	5	Score
English writing	31.00%	18.00%	14.00%	18.00%	19.00%	3.24
Literature review	7.00%	20.00%	18.00%	21.00%	34.00%	2.45
Critical thinking	20.00%	19.00%	30.00%	20.00%	11.00%	3.17
Data collection	28.00%	22.00%	13.00%	25.00%	12.00%	3.29
Data analysis	14.00%	21.00%	25.00%	16.00%	24.00%	2.85

The results reflect the functions of Gapminder that provide reliable data for its users, which could assist them achieving the tasks assigned. The Gapminder users can enhance their critical thinking skills when they try to track specific data from this online database to satisfy the research aim. The students are able to develop their data analysis skills, English writing skills as well as literature review skills when they analyze the retrieved data and wrap up the research findings into a report. It is a training process for the learners to develop the closely interrelated research skills that are essential to the academic success in a university. Gapminder as an online database has triggered this process by providing relevant research data for the initiatives of data analysis and the follow-up data interpretation and findings generating.

The students indicated that Gapminder provided “real” and “precise data” and helped them “to know what happened in the past” (see Table 4). As an online database, Gapminder is equipped with a large amount of factual and accurate data for its users. The international students have to get used to the applying the data to the empirical research in the Australian university learning context. Gapminder is also user-friendly, making “the data collection and data analysis easy and fast” (see Table 4). The students can well develop the concept of globalization by acquiring some relevant information of different countries across the world” and studying the “various relationships between different factors of different countries” and “the development and changes in different fields over the time” (see Table 4). Having a global vision can help the international students become global citizens to adapt to different settings. It is noticed that Gapminder could be used as a foundation to inform the students of a range of cultural knowledge with specific research data and initiate the investigation in the global context. However, very few students would like Gapminder to present the data in the Chinese language as well, reflecting the students’ lower competent English level. A few students would like to have more specific data from Gapminder.

Table 4. Reflection on the use of Gapminder to complete the assignment writing

Positive comments	Different voices
“It provides real data.”	“Not very specific.”
“It provides a lot of precise data.”	“No Chinese
“Gapminder shows various relationships between different factors of different countries.”	language.”
“...easy to understand the information.”	“No comment.”
“Gapminder made the data collection and data analysis easy and fast.”	
“Gapminder helps me to know what happened in the past.”	
“...this is a useful website for me to get to know some information of different countries across the world.”	
“...it clearly indicates the development and changes in different fields over the time.”	
“...it shows me the trends.”	
“Gapminder helped me gather specific information needed for my research task and also helped me notice the differences between different cultures.”	
“...it promotes a new way of thinking about the world and society.”	

In terms of the application of Gapminder, nearly three-quarters (73%) of the students would like to use it in their future study. The participants showed their interests in using Gapminder that assisted them completing the assigned assignment. For the international students coming from Asian countries, it might have been the first time for them to be exposed to an online database and struggled to complete the assignment by employing the empirical data. The students demonstrated their appreciation to the learning experiences that could assist them overcoming the academic shock and well adapting to the teaching and learning in Australian universities.

Table 5. Students' intention to employ Gapminder in their future study

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	Mean
5%	4%	18%	46%	27%	3.86

Gapminder appears to be a useful online database for the international students to retrieve relevant data. It acted as a trigger to enhance the students' academic skills, English reading and writing skills as well as cultural awareness, helping them adapt to the teaching and learning in Australian universities.

Conclusions

It could be concluded that Gapminder can facilitate international students to enhance their research skills, English language reading and writing skills, cultural awareness and critical thinking skills, assisting them well overcome the academic cultural shock and adapt to the Australian education environment. As a free online database, Gapminder provides factual, accurate and reliable data for those who would like to utilize relevant data to initiate the research. It could be implied that leveraging appropriate online databases could help international students develop both academic skills and English language competence, better facilitating the academic success in their study. Findings of this study could well be employed to inform the teaching of international students in Australian universities and in other similar contexts as well. However, this study only used one research method – online survey, for data collection. The future study might employ the interviews to collect more detailed data from the participants to triangulate the data collected.

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