

**Title - The development and evaluation of a visual image association method for efficient terminology teaching and learning: a teaching aid in the urban planning discipline**

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**Abstract**

One of the challenges in internationalised tertiary education is to teach terminology especially for students learning their major in English as second language. Students face challenges both in English and in their specific discipline during the learning process. Due to students' immature English skills, the explanation for terminologies has to go through long process. The image association method, suggested in this research, has a theoretical background and been widely used in practice particularly in language education. Storytelling is a great method in language learning as seen in powerful ability to learn language in childhood.

The primary purpose of this project is to develop a terminology learning process using image association and storytelling methods. Developed images will help students becoming familiar with new terminology in engaging ways. Images have been developed to well represent a core meaning of the terms. As these images are for the students who are in the transit period into a professional domain, this project is to stress a broad understanding of terminology instead of rigorous academic definition. After key terms in the urban planning and design field were identified, approximately 100 images were drawn for effective teaching in order to attract students' attention and improve their memory.

The materials were used to teach Year 1 non-English native speaking students who intended to major urban planning and design in an English spoken university. Overall, the students perceived the materials from this project positively. Among them, the most satisfied element was learning by the 'image' followed by story-telling and activities with the images.

*Key words: image association, story-telling, urban planning and design, terminology*

## Introduction

There is increasing demand for internationalised tertiary education with greater numbers of programs operated in English. At an individual level, a conventional approach is to study abroad in search of international standard universities, on one hand. UNESCO Institute for Statistics reported that at least 4 million students studied abroad; they accounted for 1.8% of all tertiary enrolments worldwide in 2012. This enrolment number has been doubled since 2000.<sup>1</sup> Most host universities were located in English-spoken countries. Top destinations were the U.S.A. (18%), and the U.K. (11%) followed by France (7%) and Australia (6%). On the other hand, universities located in non-English speaking countries are now strategically expanding their tertiary education programs based on English. Traditional universities often offer for courses taught in English by internationally trained academic staff. In addition, there are increasing numbers of international universities in non-English speaking countries. Typical examples are University of Nottingham, Ningbo Campus (China), Xi'an Jiaotong-Liverpool University, Suzhou (China), New York University, Shanghai Campus (China), University of Utah, Songdo Campus (South Korea), The State University of New York, Songdo Campus (South Korea), RMIT University (Vietnam Campuses) and Monash University (Malaysia) to list a few.

In this context of growing significance of English-speaking tertiary education, one of the challenges is to teach terminology especially for students learning their major in English as second language. Lectures can be ineffective due to lack of acknowledgements of students' English proficiency. Students face challenges both in English and in their specific discipline during the learning process especially at the earlier stage of tertiary education. Due to students' immature English skills, the explanation for terminologies has to go through long process. Explaining a new terminology often needs to employ additional new words. Even though academic lectures are not supposed to teach English, terminology has to be explained in English. In dealing with this issue, this project is to propose a terminology teaching method using images and storytelling approaches.

The image association method, suggested here, has a theoretical background and been widely used in practice primarily in language education. Storytelling is a great method in language learning as seen in powerful ability to learn language in childhood (Speaker, Taylor, & Kamen, 2004). Mind mapping, developed by Tony Buzan (1991), has been extensively used to improve memory with regard to the functions of human brain. In practice, there are numerous examples to support English language learning using images storytelling methods, including 'Effortless English' and 'Word

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<sup>1</sup> <http://www.uis.unesco.org/EDUCATION/Pages/international-student-flow-viz.aspx>  
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Sketch<sup>2</sup>. 'Effortless English'<sup>3</sup> is a worldwide well-known commercial English education website emphasising listening and speaking. 'Word Sketch' is a vocabulary book (or electronic device) with illustrated pictures to improve memory for new words for non-English speaking students. The theoretical background of this device is to increase the functions of brain that stimulate both the left side (for language operation) and the right side (for visual operation) of the human brain, based on the 'dual coding theory' (Paivio, 1971; Reed, 2010). Both stress 'fun' in language learning and received positive feedbacks from users.

The primary purpose of this project is to develop a terminology learning process using image association methods in the discipline of urban planning and design. Developed images and stories will help students becoming familiar with new terms in engaging ways. Images and stories have been developed to well represent a core meaning of the word. As these images are for the students who are in the transit period into a professional domain, this project is to stress a broad understanding of terminology instead of rigorous academic definitions.

## **Research design: methods and strategies**

### *Identification of terminologies in the urban planning discipline:*

The identification of key terminology is a starting point for this project. Two ways have been employed. Firstly, this project has referred to typical textbooks in urban planning and design. Textbooks generally have indexes and glossaries. Key terms were chosen from the indexes and glossaries appeared in multiple textbooks. Secondly, in order to include newly emerging terminology, this research has referred to keywords of academic papers recently published in the urban planning discipline such as 'Urban Studies', 'Habitat International', and 'Cities'. As a result, the inventory of urban planning terms for this project has been created, including 100-150 terms.

### *Developing visual images:*

Images have been created to express the core meaning of the term. The images have been developed as interesting as they can be, in order to attract students' attention and improve their memory. In drawing the images research assistants were trained in advance to understand the

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<sup>2</sup> 'Word Sketch' was developed in South Korea and massively used by students in secondary schools for their English learning.

<sup>3</sup> [www.effortlessenglish.com](http://www.effortlessenglish.com)

meaning of the terms. There were several meetings to create and modify the images drawn by the research assistants.

### *Stories:*

In addition to the images, a set of simple stories have been developed in an attempt to describe the terms within a context. As discussed by Speaker et al. (2004), storytelling methods are efficient in language learning. The developed stories have used writing materials that students have been already familiar with on purpose, such as stories and characters in popular movies, animations, and dramas.

### *Implementation:*

The developed teaching materials were taught in a (half-credit) class for first year students in one international university located in China – Xi'an Jiaotong Liverpool University (XJTLU). The vast majority of students were Chinese students who had been never educated in English-spoken environments. There were 104 students and their attendance rate in this class was approximately 80% in 2014. Each class included image exploration and story readings along with five sectoral areas: (1) transport, (2) environments, (3) urban development, (4) urban design and (5) planning, governance and policy. Each topic was taught for 1-2 weeks depending on the number of key terms identified.

## **Development of images**

Images have been developed to illustrate core meanings of the key terms in spite of lack of written definitions. Most images are composed of multiple terms as one situation can be explained with a few words. Images have employed a combination of the following five methods:

1. Direct illustration
2. Contrast
3. Multi-expressions
4. Metaphor
5. Story telling

### *Direct illustration*

Direct illustration has been used primarily for simple nouns such as an airport and runways (Figure 1). This is the most common and easiest way to describe tangible and visible goods. Figure 1 displays examples of direct illustration such as an airport, facade, air pollution and wind energy.

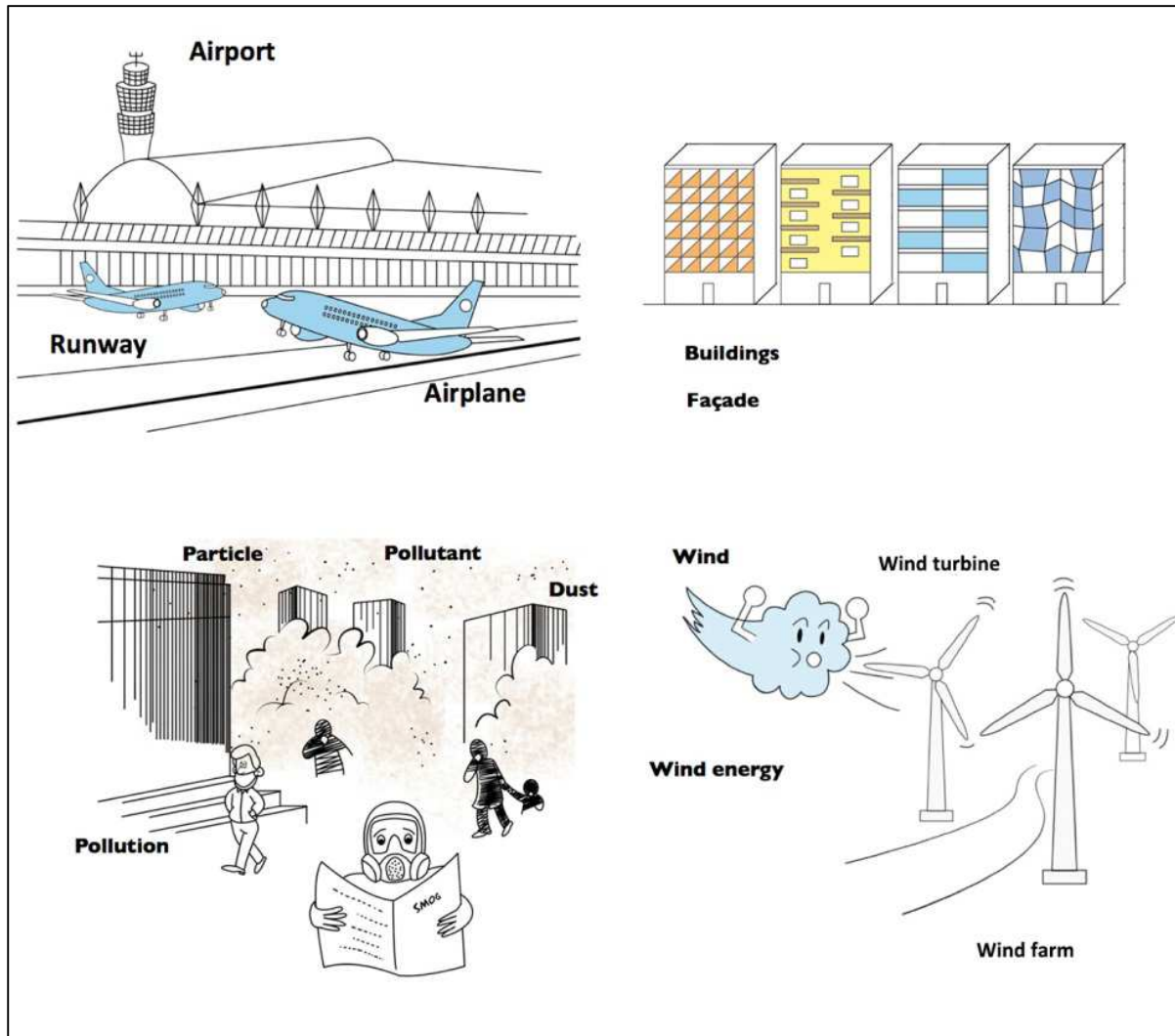


Figure 1 Example of direct illustration

### Contrast

Contrast is a useful tool to understand obviously different, opposite terms. To contrast, different elements have been emphasised while the rest remained the same. For instance, ‘imperviousness’ of surface is critical to environmental planning with respect to land use conversion. ‘Pervious’ and ‘impervious’ surfaces were described as Figure 2. Here as the two terms have a contrast meaning, similar backgrounds are used including land, cloud and rain. To emphasise different land cover, pervious surface has green colour with trees while impervious surface is in dark grey with buildings and roads. Even in this simple drawing, a short story can be found in which a story teller is a rain drop. The water drop on pervious surface shouts out “possible to get in” with smile, but the water

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drop on impervious surface says “impossible to get in” with frowned. One simple image can explain two different land covers with clear contrast.

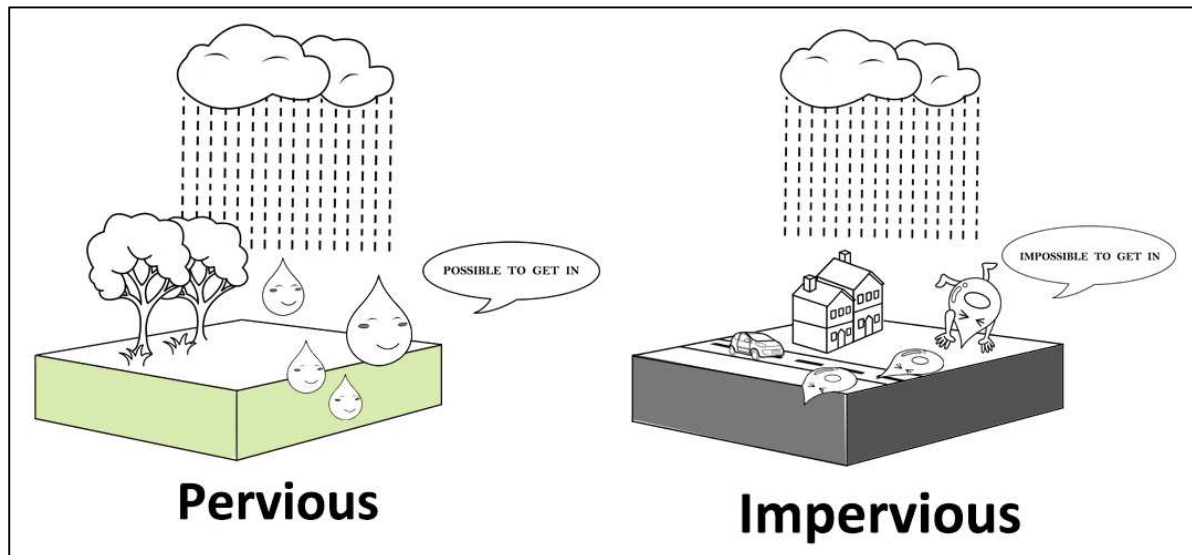


Figure 2 Example of contrast: pervious and impervious surfaces

### *Multi-expressions*

Often the same object can be expressed differently depending on the context. Also, different English styles express the same element differently. Thus, the images include different expressions to illustrate the same object. Figure 3 represents the example of multi-expressions. Cars are frequently expressed as vehicles or automobiles although these words have different meanings. In sustainable transport planning, motorised vehicles appear as a frequently used term. Thus, the image includes all the expressions as seen in Figure 3. Figure 4 displays walkability in which a pedestrian crossing is a part. Walkability employs both contrast and multi-expression methods due to different English expressions. For instance, American English uses a crosswalk while British English uses a pedestrian crossing or zebra crossing. In terms of contrast, the left image shows better walking environments with trees, pedestrian-only streets and smiling pedestrians, while the right image displays opposite situations.

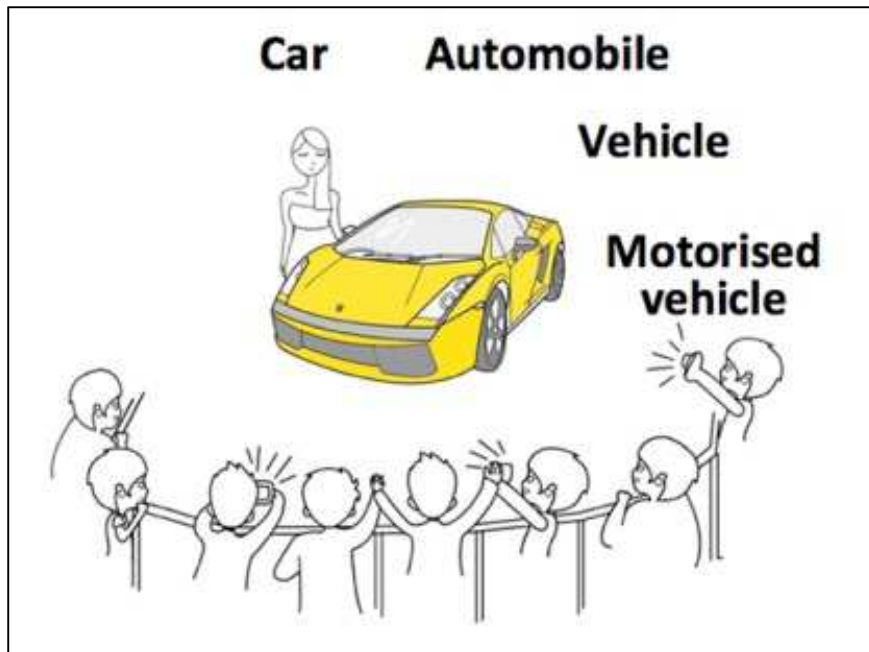


Figure 3 Example of multi-expression: vehicle

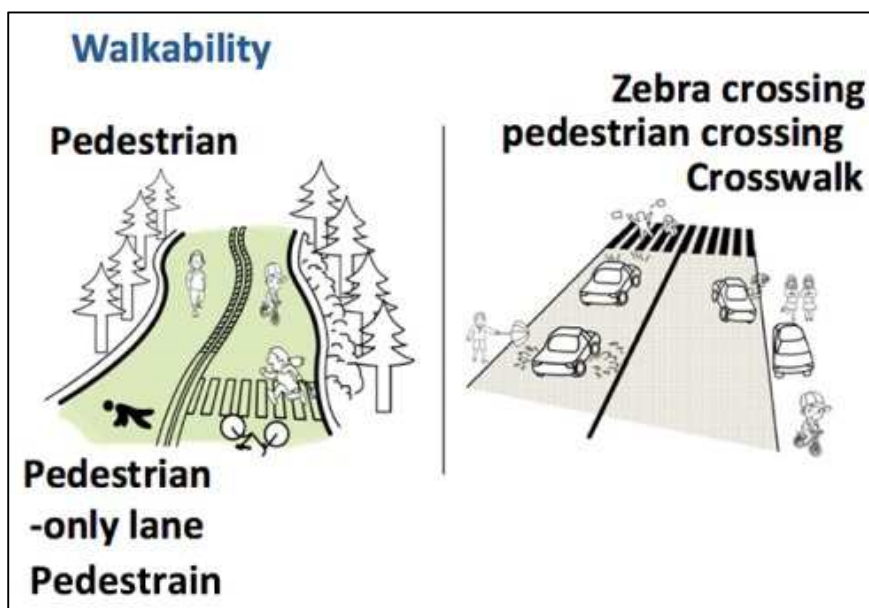


Figure 4 Example of multi-expression: walkability

### *Metaphor*

When terms have similar part that students generally know, this project employed a metaphor to illustrate the conceptual terms. For instance, irreversibility of urban development provides implications to planning and the environmental management. Once natural land has been developed into urban functions, it is hardly happening to reverse to the nature. Figure 5 uses an egg shell to describe the conceptual idea. As the broken egg shell cannot be restored, Figure 5 shows



that land use conversion from rural to urban land is irreversible. The decision makes an almost permanent impact to the city, which can be stressed by the broken egg shell as a metaphor.

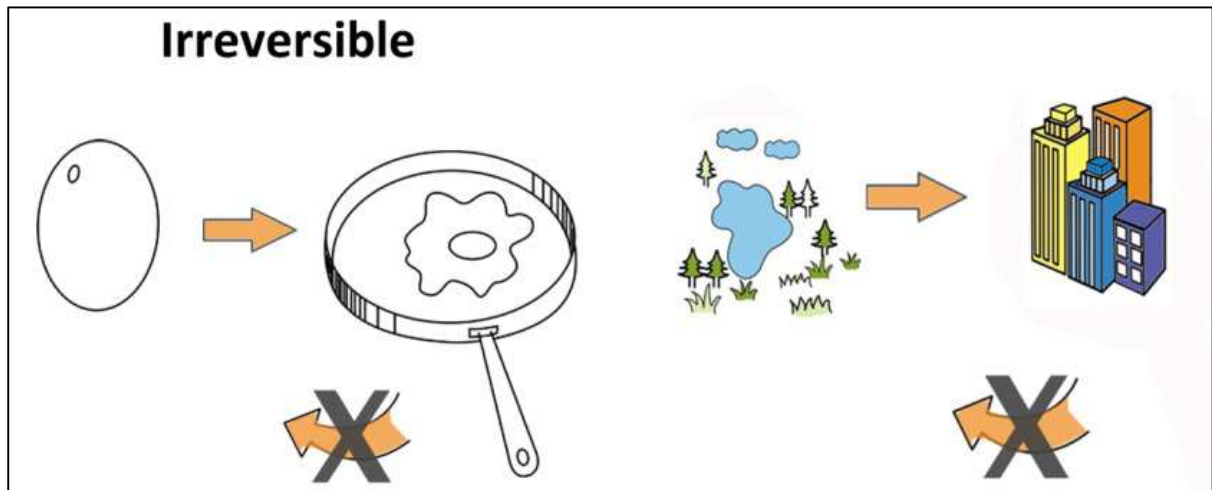


Figure 5 Example of metaphor: irreversible urban development

### *Storytelling*

Some terms are involved with several steps and processes. Gentrification is a good example for story telling as it involves process in the city. At the first stage, people started leaving the community. Then, the community was abandoned and deteriorated at the second phase. At the final phase, the community has been renovated and upgraded as people are coming back to this community (Figure 6). The former group is forcibly displaced by market forces whereby the incoming group can pay higher prices to live in the area. This term can be easily described when there are several sets of images.

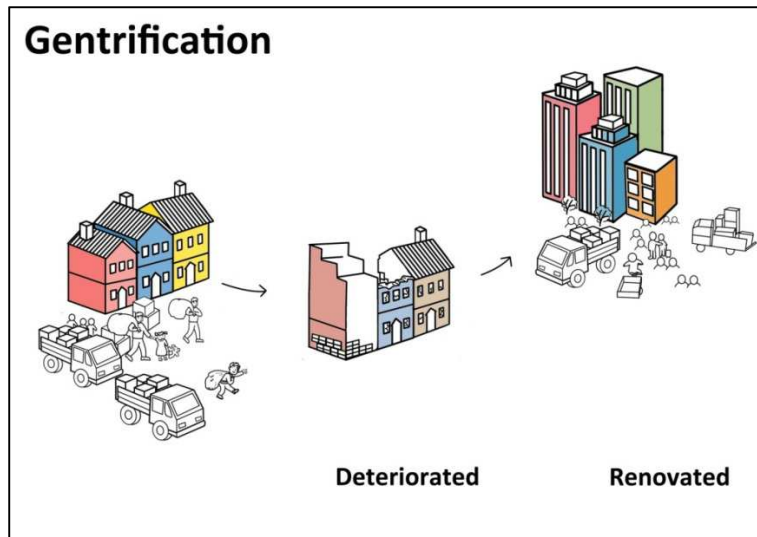


Figure 6 Example of storytelling: gentrification

## Development of stories

Developed images provide substantial understandings of the terms, but students are required to use these terms in certain contexts in spoken and written versions. Thus, sample sentences using these key terms are helpful for their use of terms. To facilitate active use of the key terms, this project has developed simple stories, called 'Silly Story Smart Learning' in this project. Each story is attached to one of the five topical areas. Silly Stories rely on story telling methods so that readers can understand the meaning within the context of the story. Story materials have been intentionally selected as the primary objective is to support students to use the terms in a proper way, not to provide creative pieces of writing. For this research, the major audience group was Chinese students. Thus, Silly Stories used what Chinese students were familiar with. Here are two examples in which the identified key terms are marked in yellow.

### Example 1. Shaolin Temple and Desakota (Environment)

Jackie Chan is a master in Shaolin Temple. Shaolin Temple was located in a mountain, named Song, and the temple was environmentally **sustainable**. People in the temple relied on **renewable energy** such as **windmills** for **power generation**. They used **rainwater** collected in a **rain water tank**. They minimised the use of **fossil fuel** for **energy generation**. Residents in the temple used **non-motorised vehicles** so that the **ecological footprint** was minimal.

However, under the Song Mountain, there was a city named '**Desakota**' where Stephen Chow or Chow Sing Chi was a mayor. In Desakota, urban areas expanded without planning. People **exploited**

*natural resources* for their economic activities. There was massive *land use conversion*. *Land cover* changed from natural soil to hard cover. People used *motorised vehicles* all the time producing *pollutants* such as *CO2* and *particles*. Stephen Chi supported *deforestation* policy to secure cheap *fuels*. The city was *environmentally degraded*. *Sanitation* in *Desakota* was poor, but the mayor was not concerned about environmental quality at all.

*Deforestation* reached Shaolin Temple one day. Jackie Chan raised this issue because the *deforestation* affected the *biodiversity* of the temple. Also, he pointed out that urban development was *irreversible*. Once *land cover* had been transformed into urban land, it was hard to change back to green land. However, Stephen Chow neglected Jackie's request. Eventually, Jackie decided to have a war against *Desakota*. All the kungfu masters and their followers gathered to fight against *Desakota*. Although people in Shaolin Temple were well-trained at kungfu, they could not win in the battle. Stephen's army was *motorised*, so soldiers were very *mobile*. However, heaven was on Jackie's side. Heavy rain started during the middle of the battle. As rain continued for one week, there was a *natural disaster* in *Desakota*. Because land surface was *impervious* there, *stormwater* made the *flooding* worse. All roads were *flooded*. *Motorised vehicles* were stuck on the road and all buildings were affected by *flooding*. Only Shaolin Temple was safe. *Pervious* land cover helped store *rainwater* underground; a high number of water tanks reduced the amount of *stormwater*. Finally, the soldiers from *Desakota* were defeated by the kungfu masters.

After this war, Stephen resigned his role as a mayor. Instead, Jackie became the new *governor* in *Desakota*. Jackie is now working hard to create a city *resilient* to *natural disasters*.

### Example 2. Compact City (Planning, Governance and Policy)

Elsa and Anna were princes in a town called '*Compact City*'. In *Compact City*, everything was nearby. Long-distance *commuting* was unnecessary for residents. Instead of strict *zoning*, all functions were mixed and integrated. The king managed *Compact City* very well so there was no *slum*. Also, the *governance* was well organised encouraging all *stakeholders* to participate in *decision-making processes*. All information was shared by *permanent* and *temporary* residents except one secret about Elsa.

Elsa and Anna were sisters. They used to be good buddies, but their parents started *regulating* Elsa. The parents kept Elsa in a separated room. The *rationale* for the *regulation* was that Elsa had a magical power that could make everything frozen. The parents did not want to disclose this secret to *the public* and so Anna lost her opportunity to meet Elsa until their parents passed away because of an unexpected accident.

In Elsa's ordination, residents in her castle happened to recognise her power. People in **Compact City** were afraid of Elsa. So, Elsa was **forcibly evicted** from the city. Elsa left Compact City in search of her own kingdom. Eventually, she found an **isolated** place; and she built the kingdom of **isolation** for her own sake. In her kingdom, everything was frozen. There was no **interaction** with other cities. It was a **self-contained autonomy**. A population **census** was not necessary because there was only one household, one institution and one government.

However, after Elsa left, **Compact City** became colder and colder, too. The city used to be **functional**, but it was **dysfunctional** because of the **climate change**. Compact City now needed to **import fuel** for heating while **exporting** ice. However, **fuel** was too expensive for **low-income households** to purchase. One day, there was a **protest** requesting **subsidies** for heating. Also, residents began moving out of the city in favour of warmer weather. Only those who could afford heating remained. It was **social segregation**. To prevent this social issue, the new queen Anna invented a central heating system through investment in **Research and Development (R&D)**. She applied for a **patent** for her system and was successful. The new policy was to provide everyone with central heating equally. So, Anna also achieved **equity** in her kingdom. The people who had left **Compact City** came back. So, the city became **gentrified** because of Anna's efficient new **invention**.

Now, the kingdom of **isolation** is a national **heritage**. There is only one **indigenous inhabitant** who is Elsa.

Example 1 pays attention to environmental issues using some elements from the Chinese movie while Example 2 simply follows the story line in a popular Walt Disney animation 'frozen'. The two example stories are designed to facilitate students to understand within the stories for their active use of the key terms. In example 1, Desakota, an Indonesian term, is described as a negative urban form in the literature (Silver, 2007). Thus, the story uses Desakota as a negative background with respect to environmental management.

## A brief evaluation

The materials were used to teach Year 1 students who intended to major urban planning and design. The number of students was 104; 38 students participated in the voluntary survey questionnaire at the end of the semester via an online survey tool (i.e. Survey Monkey). Overall, the students perceived the materials from this project positively. Among them, the most satisfied element was learning by the 'image' followed by 'Silly Stories Smart Learning' and class activities with the images. 63.2% 'strongly agreed' and 36.8% 'agreed' that the 'image' teaching is beneficial for their study

(100% in total). None of them responded 'neither agree nor disagree', 'disagree' nor 'strongly disagree'. Silly Stories perceived 86.9% positively. Only 2 students or 5.3% perceived negatively.

## Conclusion

This project has created a set of teaching tools designed to support non-English speaking students using image association and storytelling methods. The developed images and stories were taught for non-English speaking students in an international university. This project was well received by the target group as seen in descriptive results from the students' learning experience survey. The next step of this project is to conduct rigorous evaluation on this project in terms of effectiveness of learning and teaching. Due to the growing teaching tools, tertiary education can also employ new approaches in teaching. The discipline of urban planning and design includes a wide range of terms including tangible and intangible words, and conceptual words for which images and simple stories can be closely associated. With greater demand for tertiary education in English, the method developed is expected to be able to provide broader supports for lecturers and students.

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