Assessing the Achievement of First Year Physics Specialisation Students' Reading Skills through Interactive Reading Model

May Kyi Than*

Abstract

Reading skill plays a vital role in acquiring four English skills: reading, listening, speaking and writing. In the language teaching-learning process, students cannot avoid reading comprehension exercises. Therefore, students must have knowledge concerning reading skills to be able to do the reading comprehension exercises. This paper attempted to provide ways to improve the reading skills of first year Physics specialisation students using the interactive reading model by Rumelhart (1977). In order to find out their prior knowledge of reading skills, a pre-test was given first. Then, they were asked to practise five reading tasks using the interactive reading model. After practising five tasks of reading, a post-test was done to check whether they were able to apply this model. Then, the results of the pre-test and the post-test were compared in order to find out their improvement. Out of 42 students, almost all students, except few of them, significantly improved their reading skills. The effectiveness of using the model in improving the students' reading skills was assessed. It is hoped that to a certain extent, this paper will be helpful to both EFL teachers and students who want to improve the students' reading skills.

Key words: reading skills, interactive reading model, pre-test, post-test

INTRODUCTION

Language learners have to acquire four English skills: speaking, listening, reading and writing. Among them, reading skill is one of the basic skills as students have to do reading exercises throughout their English learning process. They have to read the texts, passages and paragraphs to do comprehension exercises. To be able to do the reading comprehension exercises, they must develop their reading skills. Therefore, some effective reading models should be used in engaging the learners to improve their reading skills.

There are three major popular reading models, namely bottom-up reading model, top-down reading model and interactive reading model. Bottom-up reading model is a reading model that emphasizes the written or printed text. It says that reading is driven by a process that results in meaning (in other words, reading is driven by text) and that reading proceeds from part to whole (Boothe, Walter and Stringer, 1999). Top-down reading model is a reading model that emphasizes what the reader brings to the text based on their experiential background and prior knowledge. It says reading is driven by meaning, and meaning takes precedence over structure, and proceeds from whole to part (Boothe, Walter and Waters, 1999). Interactive reading model is a reading model that recognizes the interaction of bottom-up and top-down processes simultaneously throughout the reading process. In this research, the interactive reading model developed by Rumelhart (1977) was used in order to find out the students' improvement in their reading skills.

Aim and objectives

The aim of this paper is to study the achievement of first year Physics specialisation students' reading skills using the interactive reading model.

The objectives of this paper are:
1. to examine the students' prior knowledge of reading skills

* Assistant Lecturer, Department of English, Hinthada University

2. to investigate whether the students are able to apply interactive reading model
3. to analyse and assess the improvement of the students' reading skills

Research Questions

1.What is the effect of using the prior knowledge on reading skills?
2. How do they apply the interactive reading model?
3. Do they have any achievement in their reading skills after they are introduced interactive reading model?

Literature Review

In the last 40 years, researchers have been studying the link between the reading process (what goes on in the brain) and how to teach reading. Depending on their interpretation of the reading process, they have developed a model of reading. A reading model is a graphic attempt "to depict how an individual perceives a word, processes a clause, and comprehends a text." (Singer and Ruddell, 1985)

In this section, the definition of a reading model is introduced first. After that, three reading models are briefly explained. Later on, one of the reading models is chosen.

Bottom-up reading model

Seen as the first and oldest approach to appear in teaching reading, bottom-up processing views the reading process in a traditional way (Nagao, 2002). Bilokcuoglu (2012) argues that texts are constructed from the smallest to the largest units of letters, words, phrases, clauses, sentences, texts in collaboration with grammatical knowledge. This model emphasizes on texts that are written or printed and claims that meaning is the result of a process in which reading proceeds from part to whole (Liu, 2010).

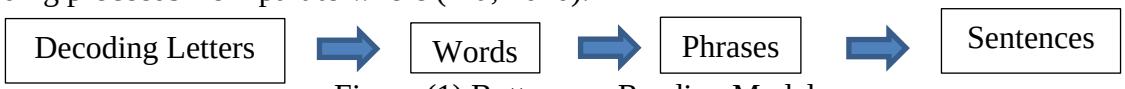

Figure (1) Bottom-up Reading Model

Top-down reading model

As a response to the need for an alternative approach in place of bottom-up processing, the top-down reading model goes in an opposite direction which emphasizes on what the reader has already known about the topic of the text and may bring to it as a process preceding from whole to part. That is partly because there is an assumption that good readers read so quickly that they do not have to rely on phonemic code. This process is referred to as concept-driven model (Liu, 2010) where knowledge of a higher level which affects processing at a lower one is involved.

In fact, top-down model is, as Treiman (2001) argues, "a whole-teaching approach in which readers focus on the context and manage to construct meanings in the text." It, therefore, would be very reasonable for Nagao (2002) to claim that the language mentioned here, in contrast with bottom-up, is not what a reader knows linguistically but contextually.

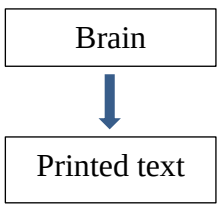

Figure (2) Top-down Reading Model

Interactive reading model

In search of a teaching approach that can do what neither bottom-up nor top-down can account for what occurs during the reading process, theorists have developed the third and latest reading model: the interactive reading model. Rumelhart (1977) defines this approach as a "combination of top-down and bottom-up processing" and proposes it as a way in which the processes of both data-driven sensory information and non-sensory information happen simultaneously. Bilokuoglu (2012) suggests that in interactive model, "readers are expected to go through both bottom-up and top-down processing before eventually settling upon an interpretation of a text topic."

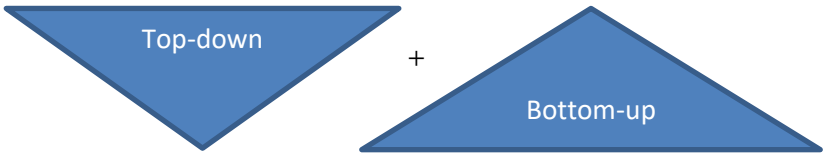

Figure (3) Interactive Reading Model

Among three models of reading, interactive reading model was chosen because it is the best reading model compared to other two models. As it is the combination of top-down and bottom-up reading models, all the benefits of these two models are applied. Therefore, students can better understand and answer the reading comprehension questions more systematically by using the interactive reading model.

Related researches

It has been found out that there are some related researches based on the interactive reading model. For instance, in MA TESOL Collection, McRae (2012) did a research on "Utilizing the Interactive Reading Model in a Continuing Education Course". In her paper, she sought to provide the interactive reading model as an alternative method of reading instruction to female Saudi Arabian University students.

Walker (1989) also presented an interesting paper on "The interactive Model of Reading: Deciding How Disability Occurs". The author tried to analyse reading difficulty by using the interactive reading model as a framework. However, no research based on this model has been done in Hinthada University. Therefore, this paper tried to find out the effectiveness of this model, with the students in this university.

Research Methodology

This research aimed to assess the students' achievement in reading skills after they were introduced the interactive reading model. It was conducted in the Academic Year 2018-2019.The participants of this research were first year Physics Specialisation students at Hinthada University. There were altogether 42 students who were chosen as the research participants. Students with great interest of reading and the ones who were willing to participate until the end of the tests were chosen as subjects.

In this research, in order to find out the students' prior knowledge of reading skills, first of all, the students were asked to take a pre-test containing four question types as shown in Appendix A. In this pre-test of reading comprehension, there were altogether 4 types of questions:

(1) matching the paragraphs to the headings
(2) saying whether the sentences are True/ False
(3) matching the words from the article to the definitions

(4) comprehension questions (short answers)

Then, the students were introduced the interactive reading model to practise reading comprehension exercises. After practising five samples of reading, a post-test was given to check whether they were able to apply this model or not. Like the pre-test, four items were prepared for the post-test too as shown in Appendix B. In post-test reading comprehension exercises, there were also 4 types of questions:

(1) matching the paragraphs to the headings,
(2) saying whether the sentences are True/ False/ Not Given,
(3) matching the words from the newsletter to the definitions and
(4) comprehension questions (short answers).

Then, their answer papers were marked and their respective percentages of scores on both tests were calculated. After that, percentages of each test were shown with tables and charts. Finally, the percentages of the pre-test and the post-test scores were compared by using a table and a chart in order to highlight the different results. In this way, the achievement of the students who took the two tests were assessed and observed. They were also whether an obvious improvement was seen after using the interactive reading model or not.

RESULTS AND DISCUSSION

In this section, results of the pre-test of first year Physics Specialisation students are presented first, followed by results of the post-test and then the discussion.

Table (1) Results of the pre-test of first year Physics Specialisation Students

Percentageof students' marks	100 %	95 %	90 %	85 %	80 %	75 %	70 %	65 %	60 %	55 %	50 %	45 %	40 %	Under 40 %
Number of students	-	-	-	3	5	3	8	9	6	5	1	1	1	-

As seen in Table (1), out of 42 students, 3 students got 85%, 5 students 80%, 3 students 75%, 8 students 70%, 9 students 65%, 6 students 60%, 5 students 55%, 1 student 50%, 1 student 45% and 1 student 40% of the total scores respectively. According to Table (1), there were not any students who got 100%, 95%, 90% or under 40%.

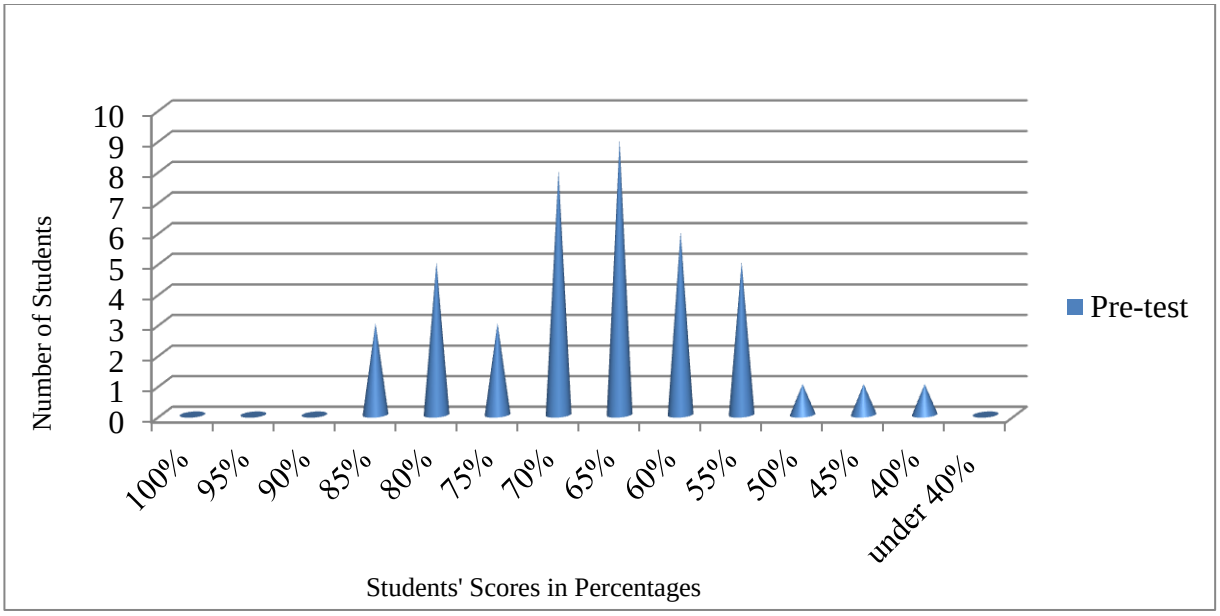

Figure (1) Percentages of students' scores of the pre-test

The above chart indicates the ability of the students before introducing the interactive reading model. As seen in Figure (1), no students got the 100%, 95% and 90% of the total scores. And there are some students who were weak at doing the reading comprehension questions. This may be because of their lack of background knowledge. So, their results were not so good.

Before the pre-test, they did not know the way of attempting the questions using a reading a model. So, they did not get good results in the pre-test. Before the post-test, they were asked to practice with five sample texts and reading comprehension exercises using the interactive reading model. So, when they did the post-test, they came to realize that there were some effective reading models for handling reading comprehension exercises.

Table (2) Results of the post-test of first year Physics Specialisation Students

Percentageof students' marks	100 %	95 %	90 %	85 %	80 %	75 %	70 %	65 %	60 %	55 %	50 %	45 %	40 %	Under 40 %
Number of students	-	10	9	8	10	2	-	-	1	2	-	-	-	-

However, as seen in Table (2), out of 42 students, 10 students got 95%, 9 students 90%, 8 students 85%, 10 students 80%, 2 students 75%, 1 student 60% and 2 students 55% of the total scores respectively. According to Table 2, it is obviously seen that 10 students got 95%, 9 students get 90%. Moreover, numbers of students who get 85% increase from 3 students to 8 students. Besides, the number of students who got 80% becomes doubled. But, no students got 50%, 45%, 40% and under 40%. So it can be concluded that most students improved their achievement in the post-test.

Compared to Table (1), it is obviously seen that the number of the students who could do well in the post-test increased. There were few students who could not do well in the post-test too. But, most of the students got better results in the post-test.

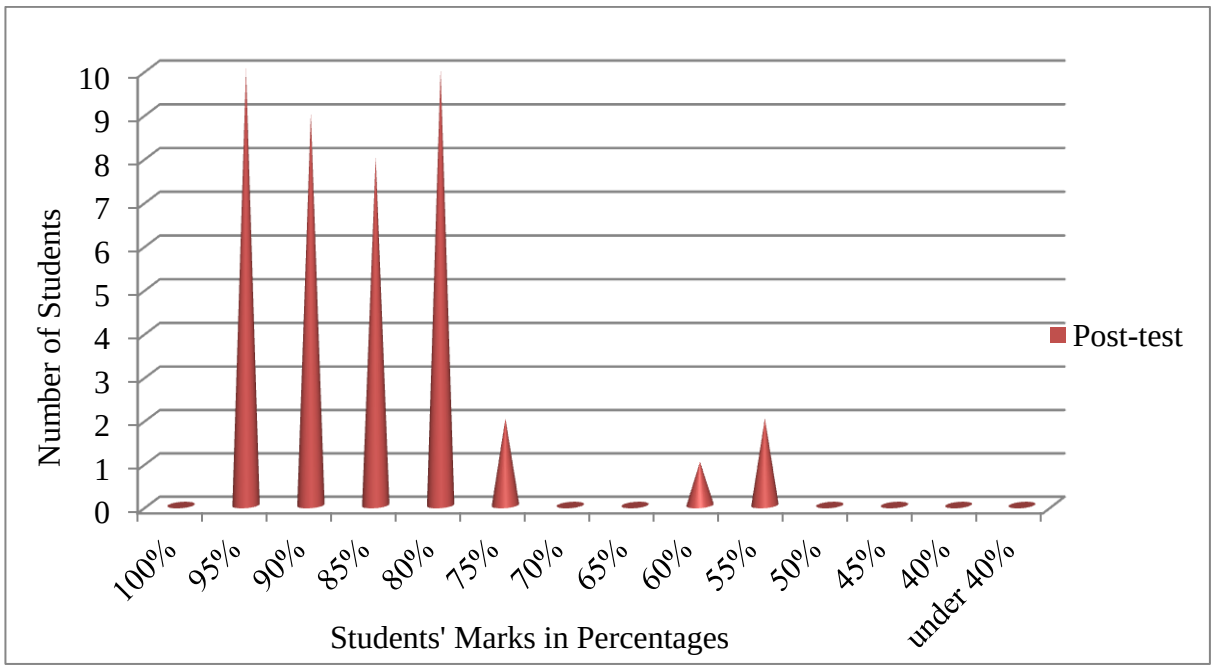

Figure (2) Percentages of students' scores of the post-test

In Figure (2), better achievement of students in handling the reading comprehension exercises can clearly be seen. Moreover, it can be seen that the percentages of the students with low marks considerably decreased.

Before taking the post-test, they were taught how to answer the questions by applying the interactive reading model. After that, they sat for the post-test. But at that time, they answered the questions by using the interactive reading model. So, it is certain that they got better results in the post-test due to the use of the interactive reading model.

Table(3) Results of the pre-test and post-test of first year Physics Specialisation Students

Sr. No.	Percentage	Number of students (Pre-test)	Number of students (Post-test)
1	100%	-	-
2	95 %	-	10
3	90 %	-	9
4	85 %	3	8
5	80 %	5	10
6	75 %	3	2
7	70 %	8	-
8	65 %	9	-
9	60 %	6	1
10	55 %	5	2
11	50 %	1	-
12	45 %	1	-
13	40 %	1	-
14	under 40%	-	-
Total		42	42

Table (3) shows the results of the pre-test and the post-test of the first year Physics Specialisation students. According to Table (3), it is obvious that 19 students got the higher percentages of the resultsin doing the pre-test. But in doing the post-test, the number of students who got the high percentages of the results becomes 39. Besides, it is apparent that the number of the students who were at the medium level (about 65%) decreased. And, the number of the students who got lower percentages of the results decreased from 8 to 2.

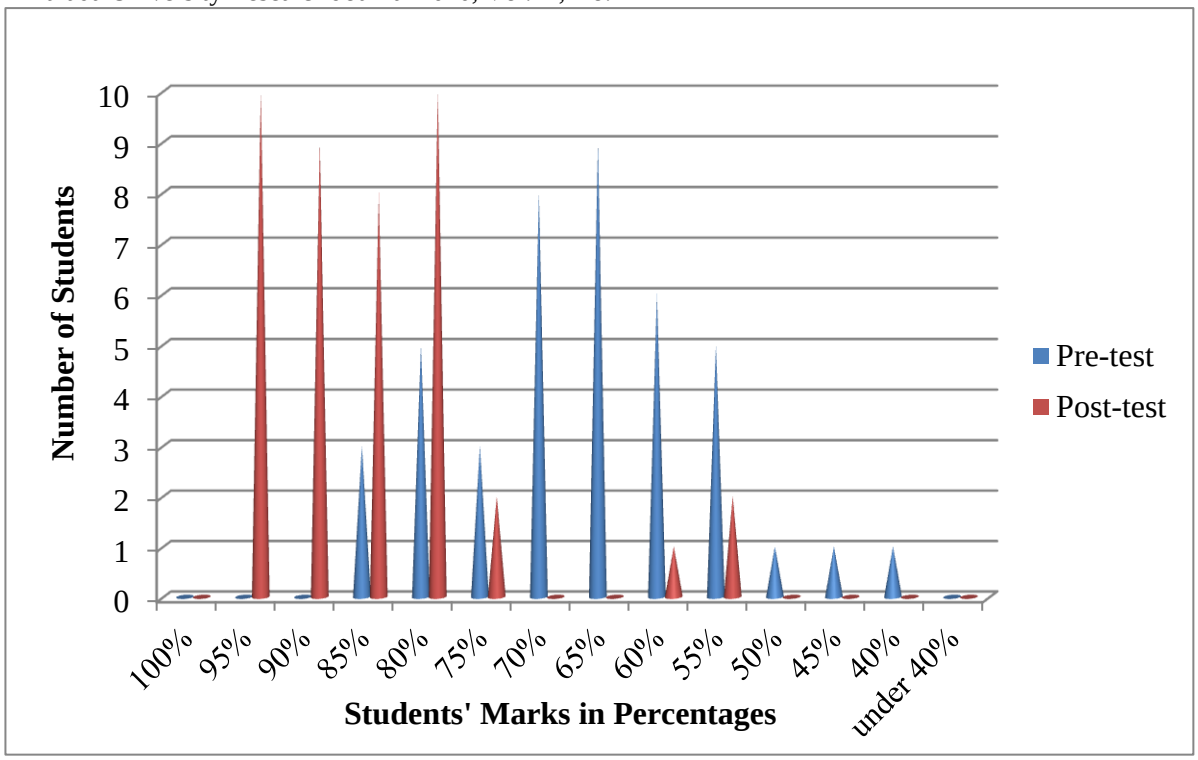

Figure (3) Pre-test and Post-test Results of First Year Physics Specialisation Students

As seen in the above chart, there is no student who got 100% while taking both pre-test and post-test. In this chart, a dramatic difference between the results of the pre-test and the post-test can be seen. Much more numbers of students who got greater percentages (up to 95%) are seen in the post-test. But, there were some students who got medium percentage (65%) were seen both in the pre-test and the post-test. However, few of the students who got lower percentages of scores (55%) are seen only in the post-test.

The above tables and the figures indicate results of the pre-test and the post-test of the first year Physics Specialisation students. And it is apparently seen that almost all students, except few of them improved their reading skills after applying the interactive reading model. It was also found that in doing the pre-test, they thought that they had to understand each and every word. Therefore, when they did not understand the meaning of every word, they doubt that their answers would not be correct and they lacked self-confidence.

Moreover, they did not recognize guessing the main idea from the context as part of their reading comprehension. Besides, they did not know how to look for the contextual clues. Furthermore they did not realize to use their prior knowledge in reading texts. And, they could not proceed from the smallest units of the texts such as letters to the whole text. Therefore, they did not do well in the pre-test.

Before doing the post-test, they were introduced the interactive reading model which was a combination of bottom-up and top-down reading models. Moreover, they were asked to practice five samples of reading. In doing the post-test, the majority of the students could do better and had better understanding. It was found that most students had improved in the post-test. Before using the interactive reading model, students had difficulties in doing reading comprehension exercises. But, after the interactive reading model was introduced to the students, they could do better in reading comprehension exercises and improved their reading skills to a significant extent.

CONCLUSION

This paper tried to assess the achievement of the students' reading skills using the interactive reading model. According to the results, it is found out that this model is effective for students' reading skills. After introducing the interactive reading model and practising the five samples of reading passages, the students came to realize that there were some effective reading models for doing reading exercises. Due to the time-limit, only one reading model could be introduced to the students. Out of many, this model is recommended to them so that it might be of some help to improve their reading skills. This study will be more effective if students' errors will be analysed and remedied; and then other models are introduced one after another.

Acknowledgements

I would like to express my profound gratitude to Dr Theingi Shwe (Rector, Hinthada University), Dr Yee Yee Than (Pro-Rector, Hinthada University) and Dr Cho Kyi Than (Pro-Rector, Hinthada University), for their permission to write this paper in Hinthada University Research Journal. I would also like to extend my sincere thanks to Dr Toe Su Hlaing, Professor and Head of English Department, for her invaluable guidance and suggestions in conducting this research. I would also like to express my appreciation to the students who actively and willingly participated throughout the research.Last but not least, I would like to express my heartfelt thanks to all the people who helped me in various ways to accomplish this research.

References

Bilokcuoglu, H. (2012). *Theories of reading and their implications to the teaching of reading in ESL/EFL classes and places of schemata theory on foreign language reading comprehension*. Retrieved 2014 , from Developing Teachers:

Liu, F. (2010). *A Short Analysis of the Nature of Reading. English Language Teaching*, Vol. 3, No. 3.

Nagao, H. (2002). *Using Top-Down Skills to Increase Reading Comprehension*. Kagawa Prefecture: Takase Senior High School.

Rumelhart, D. E. (1977). *Toward an interactive model of reading*. In S. Dornic (Ed.), Attention and performance. Hillsdale, NJ: Laurence Erlbaum Associates.

Treiman, R. (2001). Reading. In Aronoff, M & Rees-Miller (Eds), *Blackwell Handbook of Linguistics* (pp. 664-672). Oxford: Blackwell.

e-Resources

https://digitalcollections.sit.edu

www.developingteachers.com/articles_tchtraining/readingpf_hasan.htm

Appendix (A)
Pre-test

I. Read the article and match the paragraphs 1-4 to the descriptions a-d.

- a. The writer learns about her great-great-grandfather.
- b. The writer gives some reasons why family history is popular.
- c. The writer tells us that family history is popular in the UK.
- d. The writer finds that family history is not always a safe, quiet hobby.

II. Say whether the following sentences are True or False.

1. A lot of people in the UK are now interested in family history.
2. Eve Fuller wants to find a famous relative.
3. One of Adam Deen's relatives was a detective.
4. Frank Stevens wants to talk his great-great-uncle
5. One of the writer's relatives worked with animals.
6. The writer's daughter is not interested in his great-great-grandfather's job.

III. Match the words from the article 1-6 to the definitions a-f. The paragraph numbers are in brackets.

A	B
1. genealogy (1)	a. someone who likes something or someone very much
2. hobby (1)	b. origins and education
3. background (2)	c. spare time activity
4. fan (2)	d. a very small town in the countryside
5. murdered (3)	e. family history
6. village (4)	f. killed

IV. Answer the following questions.

1. Give two examples of genealogy sites mentioned in the passage.
2. Why did Jenny Draper's family move to New Zealand?
3. How much popular is genealogy in the UK?
4. Who got in touch with a great-uncle?

WHERE AM I FROM?

WHO AM I FROM?

(1) What was your grandmother's grandfather's job? Like many English people, I didn't know the answer to this question and I wasn't very interested. But more and more people want to know this sort of thing. Family history (or genealogy) is now the second most popular hobby in the UK. Websites like genealogy.com and ancestors.com have many visitors every day. What are the reasons for this change?

(2) One reason is the internet. Now you can do a lot of family history work on your computer. But why do people do it? Is it because they want to find famous relations? 'No, it isn't,' says Eve Fuller from a popular genealogy site, 'I started when my grandmother died. I wanted to know more about her background. It's my history.' Another genealogy fan, Adam Deen, says it's 'the Sherlock Holmes thing', the detective work: 'You look for clues,' he says. 'You learn surprising things.'

(3) Some people learn things they don't want to know. 'Now I know why my family moved to New Zealand,' says Jenny Draper. 'My great-great-uncle murdered his wife!' Others find relations that they don't want to know. Frank Stevens got in touch with a great-uncle: 'Now he phones me every day! But we have nothing in common!'

(4) So, what was my great-great-grandfather's job? I found the answer after a few hours on a popular genealogy site. He was a sheep farmer in Yorkshire. 'How boring!' I thought. 'Why am I doing this?' I still don't know why. But last weekend I took my daughter to a little Yorkshire village. 'This is where your great-great-great-grandfather lived,' I told her. 'Can we go home now?' she replied.

Appendix (B)
Post-test

I. Read the newsletter. Match the paragraphs 1-5 to the headings a-e below.

- a. We'd like to hear your suggestion.
- b. A teenager's death
- c. Can you help?
- d. The porters of Kilimanjaro
- e. Our plan to help the porters

II. Say whether the following sentences are True (T), False (F) or Not Given (NG) in the newsletter.

1. Most visitors worry about the porters.
2. The weather conditions at the top of the mountain are more difficult for tourists than for the porters.
3. A 16-year-old boy, Rashid, hoped to earn $ 6 a day as a porter on the Maragu route.
4. Local porters feel happy when they receive clothes and equipment donated by the visitors.
5. The most popular tourist trail to the top of Kilimanjaro is the Marangu route.

III. Match the words from the newsletter 1-6 to the definitions a-f.The paragraph numbers are in brackets.

A	B
1. porters (1)	a.to get money for work that you do
2. earn (2)	b. a way that you follow to get from one place to another
3. route (2)	c. people whose job are carrying people's bags and other loads
4. spokesperson (s) (3)	d. the things that are needed for a particular purpose or activity
5. conference (4)	e. a person who speaks on behalf of a group or an organization
6. equipment (5)	f.a large formal meeting where a lot of people discuss important matters such as business, politics, or science, especially for several days

IV. Answer the following questions.

1. Where do the porters of Kilimanjaro come from?
2. What is the most popular tourist trail to the top of Kilimanjaro?
3. Where and when will the conference be held?
4. How can the visitors give extra clothes and equipment to local porters?

CARING CLIMBERS

NEWSLETTER

(1) _____

Every year they carry everything for thousands of visitors to see the beauty of Africa's highest mountain. But most of us never worry about the people with the hardest jobs on Kilimanjaro: the porters. 'The porters are from here,' we think. 'They know the local weather. They know the dangers.' The truth is very different. Most porters come from Moshi, a poor town at the base of Mount Kilimanjaro. The weather conditions at the top of the mountain are not easier for the porters than for tourists. But their clothing is usually a lot worse.

(2) _____

Rashid, 16, left his family in Moshi. He hoped to make $6 a day as a porter on the Marangu route – the most popular tourist trail to the top of Kilimanjaro. He never earned enough money to buy the right clothes. In September, he died of cold on the mountain. He was wearing only a T-shirt and jeans.

(3) _____

Next month we are meeting with spokespersons from fourteen international tour companies in Marangu. We want to discuss regular jobs for porters.

(4) _____

Come to the conference and share your ideas!
Basecamp Hotel, May 10, 12.00.

(5) _____

Do you have any extra clothes and equipment we can give to local porters? Please leave them at the Clothing Bank in the centre of Moshi.