

Effects of Lyrical Music in Different Languages on English Reading Comprehension of Thai Learners¹

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Abstract

The present study aims at investigating the effect of English and Thai lyrical music on Thai learners' reading comprehension, and comparing the outcome scores between detail items and main idea items, which are two important types of reading comprehension questions. Participants in this paper were thirteen students of Mae Fah Luang University majoring in English who were native of Thai, and had high proficiency in English language. The results indicated that the lyrical music distracted participants' reading comprehension. Nevertheless, there was no significant differences between Thai and English lyrical music. In addition, listening to music while reading affected participants' understanding in detail questions more than main idea questions since music was probably distracting participants' concentration of remembering all the detail more than comprehending the overall ideas or messages of the text.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของเพลงที่มีเนื้อร้องทั้งภาษาอังกฤษและไทย ต่อการอ่านจับใจความของนักเรียนไทย โดยมีการเปรียบเทียบผลลัพธ์การอ่านจับใจความ ทั้งในการอ่านจับใจความสำคัญและการอ่านจับใจความรายละเอียดของเรื่องที่อ่าน กลุ่มเป้าหมายในงานวิจัยนี้ คือ นักเรียนชาวไทยที่กำลังศึกษาอยู่ในภาควิชาภาษาอังกฤษ มหาวิทยาลัยแม่ฟ้าหลวงที่มีความเชี่ยวชาญด้านภาษาอังกฤษสูง จำนวน 13 คน ผลการวิจัยพบว่าเพลงที่มีเนื้อร้องทำให้ความสามารถในการอ่านจับใจความของนักเรียนลดลง อย่างไรก็ตามเพลงที่มีเนื้อร้องภาษาไทยและภาษาอังกฤษไม่มีความแตกต่างกันอย่างมีนัยสำคัญ นอกจากนี้การฟังเพลงในขณะที่อ่านจับใจความมีผลกระทบต่อ การอ่านจับใจความรายละเอียดของเรื่องที่อ่านมากกว่าการอ่านจับใจความสำคัญ เนื่องจากเพลงอาจรบกวนทำให้นักเรียนมีสมาธิในการจดจำรายละเอียดทั้งหมดมากกว่าเข้าใจแนวคิดหรือข้อความโดยรวม

1. Introduction

It cannot be denied that teaching students to read accurately and fluently with comprehension is one of the main purposes of education. Reading plays an important role as a great deal of formal education relies on being able to read with understanding. Particularly, the reading process requires continuous practice, development, and refinement. In addition, reading requires creativity and critical analysis. (Erickson, Peters, & Strommer, 2006)

Reading comprehension is the process of making meaning from text. The simple purpose is to acquire an overall understanding of what is described in the text rather than to obtain the meaning from isolated words or sentences (Woolley, 2011).

Basically, there were various types of reading comprehension questions. Main idea questions and supporting details questions; however, were two important types of questions normally found in reading comprehension tests. According to the study of Day & Jeong-suk (2005), it was stated that main idea questions were the questions highlighting the most important nodal concept of a paragraph or the overall content of text, which expresses what the text is about. For example, what is main purpose of the conversation? On the other hand, supporting ideas questions required only reader's an understanding of the uncomplicated and simple meaning of the text, such

as the meaning of some words in text, times, events, and places. Questions of details were always answered straightforward and obviously from the text. For example, what I should do is. Accordingly, main idea questions were only capable of measuring readers' understanding of main points in the text. On the other hand, detail questions could be only utilized to measure readers' concentration while reading the text since readers were required to focus on what is exactly going on in the text. main idea questions were only capable of measuring readers' understanding of main points.

The comprehension involves the interaction of cognitive skills. Generally, it was found that proficiency in reading involves many variables such as automaticity of word recognition and familiarity with text structure by using sophisticated computer and eye-tracking technologies in order to make this process is more rapid, accurate, and automatic (Just & Carpenter, 1987; Pressley, 1998; Rayner, 1997; Stanovich, 2000; West, Stanovich, & Cunningham, 1995). For example, according to the study by Just and Carpenter (1987), it was discovered that good readers process over 80% of content words and 40% of function words on the page. Additionally, familiarity with text structure is believed to be an effect on reading comprehension that can distinguishes between good and poor readers. Knowledge of text type and organization is believed to have a facilitative effect on reading comprehension. According to Commander & Stanwyck (1997), a study investigating the comprehension monitoring of expository text in adult L1 readers indicated that good readers demonstrated more accurate recall of superordinate ideas regardless of text length than poor readers did. In addition, Commander and Stanwyck (1997) suggested that good readers have a good knowledge of structural elements of text and therefore have more accurate recall of the main ideas in the text. On the other hand, poor readers focused on details of paragraph.

Particularly, music indeed has been investigated to find the effects on reading comprehension over decades since it was found that both positive and negative comments concerning the effectiveness of music in reading comprehension are remarkably noticeable (Gillis, 2010). The outcomes of those previous studies can be illustrated as a complex picture. Many studies found that music with or without lyrics has different impacts on reading comprehension.

Obviously, several research papers found that listening music without lyrics while reading encourage reading comprehension whilst music with lyrics distracted ability of reading comprehension (Tonekaboni, 2017; Rashidi & Faham, 2011; Liapis, Giddens and Uhlenbrok, 2008).

One of the most widely publicized research studies of reading comprehension without-lyric condition is the study of effect of classical music on the reading comprehension of Iranian students. Rashidi and Faham (2011) stated in their study that participants who were reading with without-lyric classical music condition scored significantly higher than the with-lyrics condition. In related study by Tonekaboni (2017), there were two groups of participants; one were conditioned by Beethoven music while the other was not. Tonekaboni (2017) concluded that the music group showed greater increase in reading comprehension than non-music group. He therefore asserted that reading while listening to non-lyric music helps increase comprehension in reading. Similarly, Liapis, Giddens and Uhlenbrok (2008) tested the impacts of lyrical and non-lyrical music on reading comprehension. Participants were divided into two groups, and each group was asked to read the same article under two different musical conditions, one while listening to a song with lyrics and the other while listening to the same song without lyrics. Participants with the non-lyrical condition significantly scored. Nevertheless, they asserted that the difference was not outstanding. In relation to this, non-lyric music had a positive effect on cognitive ability, but there was no significant effects of the difference between lyrical and non-lyrical music (Tonekaboni, 2017)

Focusing on lyrical music, most widely publicized research studies of reading comprehension with-lyric condition found that lyrical music was more likely to be a barrier of reading comprehension (Anderson & Fuller, 2010; Liapis, Giddens & Uhlenbrock, 2008; Miller, 2014). Miller (2014) conducted the research on the differentiated effects of lyrical and non-lyrical music on reading comprehension of American undergraduates. Participants in his study were divided into five groups: no music group, lyrical classical music group, non-lyrical classical music group, lyrical rock music group, and non-lyrical rock music group. He concluded that non-lyrical classical music group outscored (15.294 out of 18) while lyrical classical music group received the lowest scores in this experiment (13.154 out of experiment). In relation to this, lyrical music is probably distracting readers' comprehension while reading. In related study by Gillis (2010), there

were seventy-one participants (American undergraduates) which were divided into three groups: silence condition group, lyric music condition group, and non lyrical condition group. It turned out that the performance of participants with silence condition group was better than other participants in the two music conditions. She concluded that there was a significant negative impact on participants' reading comprehension—simply put, lyrical music is prone to distract reading comprehension of participants. Nevertheless, as mentioned so far in many previous studies, the difference between lyrical and non-lyrical music was not significant in terms of distracting participants' reading comprehension.

Particularly, as it was found that the English language was native language of participants involved in the previous studies, it could be concluded that they were more likely to be familiar with the language in music. This means that listening to music of one's own native language would not much affect on reading comprehension. This line of this study then will move in the direction of determining how listening to non-native (The English Language) and native (Mother Tongue) music impact Thai students' reading comprehension. Therefore, the first discussable point of this study is that whether Thai and English lyrical music could have any significant effects on Thai learners' English reading comprehension

Additionally, with a number of research papers, reading comprehension tests were usually equipped with various types of questions in order to evaluate readers' comprehension of texts. Moreover, it was found that most of the previous studies merely presented the outcome of the effect of music towards reading comprehension without stating what types of questions are affected by lyrical music the most. Because different types of question require different levels of concentration, these questions could indicate the significant the readers' comprehension of English text while listening English lyrical music. Another discussable point of the present study therefore is that whether listening to English and Thai lyrical music could affect the main idea or details questions the most.

1.2 Objectives

1. To investigate the overall effect of English and Thai lyrical music on Thai learners' English reading comprehension.
2. To compare the correctness of detail questions and main idea questions of Thai learners' reading comprehension while listening to English and Thai lyrical music

1.3 Hypothesis

Listening to Thai lyrical music is more likely to distract the English reading comprehension for Thai students rather than listening English lyrical music.

2. Methodology

2.1 Participants

This study was conducted with one group of Thai learners at the age of 22, with the high level of proficiency by choosing 15 fourth-year students majoring in English studying at the Mae Fah Luang University, Thailand. Since they were a group of students who studying the most number of english courses (a minimum of 109 credits) comparing to non-English major students.

2.2 Instruments

There are four instruments in this study: the English lyrical music, the Thai lyrical music, English reading comprehension test I and English reading comprehension test II.

2.2.1 The English lyrical song

To measure participants' reading comprehension abilities, the English-lyrical song of "I see the light - Mandy Moore & Zachary Levi" was played online via Youtube within 10 minutes. The song was selected with reasons that it is not too fast and slow beat to follow.

2.2.2 The Thai lyrical song

To measure participants' reading comprehension abilities, the Thai-lyrical song of “เห็นแสง
ประกาย-ชนนัยน์ สุขวัญจน์” was played online via Youtube within 10 minutes. The song was selected
with the reasons that it is not too fast and slow to follow. Moreover, the song existed in Thai version
of the English-lyrical song of “I see the light - Mandy Moore & Zachary Levi”.

2.2.3 English reading comprehension test I

To measure participants' reading comprehension abilities while listening to the English-
lyrical song of “I see the light- Mandy Moore & Zachary Levi” which lasted for three and a half
minute, a long English conversational style of text was obtained, as provided in Appendix A. The
conversation was obtained from International English Language Testing System (IELTS) Practice
Book in academic level. The conversations found was a long dialogue between two people talking
face-to-face. It was equipped with information of the educational field. The conversation was
chosen because all participants, English major students, presumably know about. The test
consisted of twelve questions with four-answer multiple choices developed to measure reading
comprehension; 9 questions were the details of conversation and 3 questions were the main ideas.
With the scores, 1 mark would be given to the correct item for the details questions as it only
required the recognition of what they have seen in text. 2 marks on the other hand were for main
idea questions since it required the great effort manner in summarizing what the text really
describes.

2.2.4 English reading comprehension II

To measure participants' reading comprehension abilities while listening to the Thai-lyrical
song of “เห็นแสงประกาย โดย ชนนัยน์ สุขวัญจน์” which lasted for three and a half minute, a long English
conversation was obtained, as provided in Appendix B. The conversation was obtained from
International English Language Testing System (IELTS) Practice Book in academic level. The
conversations found was a long dialogue between two people talking face-to-face. It was equipped
with information of the educational field. The conversation was chosen because all participants ,

English major students, presumably know about. The test consisted of twelve questions with four-answer multiple choices developed to measure reading comprehension; 9 questions were the details of conversation and 3 questions were the main ideas. With the scores, 1 mark would be given to the correct item for the details questions as it only required the recognition of what they have seen in text. 2 marks on the other hand were for main idea questions since it required the great effort manner in summarizing what the text really describes.

2.3 Data Collection

The study findings were based on reading comprehension test I and II part. In reading comprehension test I, participants at the first stage were given English dialogue and at the same time were required to listen to English lyrical music within 10 minutes. During reading process, participants were prohibited to look at questions of the test. Then, they at the second stage were asked to complete twelve questions of reading comprehension test I with no limit of time.

In reading comprehension test II, participants at the first stage were given English dialogue and at the same time were required to listen to Thai lyrical music within 10 minutes. During reading process, participants were prohibited to look at questions of the test. Then, they at the second stage were asked to complete twelve questions of reading comprehension test I with no limit of time.

2.4 Data Analysis

The results were analysed into two main parts:

2.4.1 The total correctness of reading comprehension I and II

The total score of all participants were calculated into percentage. The final percentage of Thai lyrical and English lyrical group was then compared to find the significance in terms of effects.

2.4.2 The comparative analysis between the percentage of the correctness of detail items and main idea items

According to reading comprehension test I and II, the questions were categorized into two parts, detail items and main idea items. The final total from main ideas and details questions was

calculated to find the percentage of correctness. Then, each part was compared to find the significance in terms of effects.

3. Results

The results in this study were divided into two major parts: the total correctness of reading comprehension I and II and the comparative analysis between the percentage of the correctness of detail items and main idea items.

3.1 The total correctness of reading comprehension I and II

Reading comprehension test I aimed to investigate the effects of English lyrical music on reading comprehension, whilst Reading comprehension test II aimed to investigate the effects of Thai lyrical music towards reading comprehension. The percentages of the total correctness of reading comprehension I and II was shown in Figure 1.

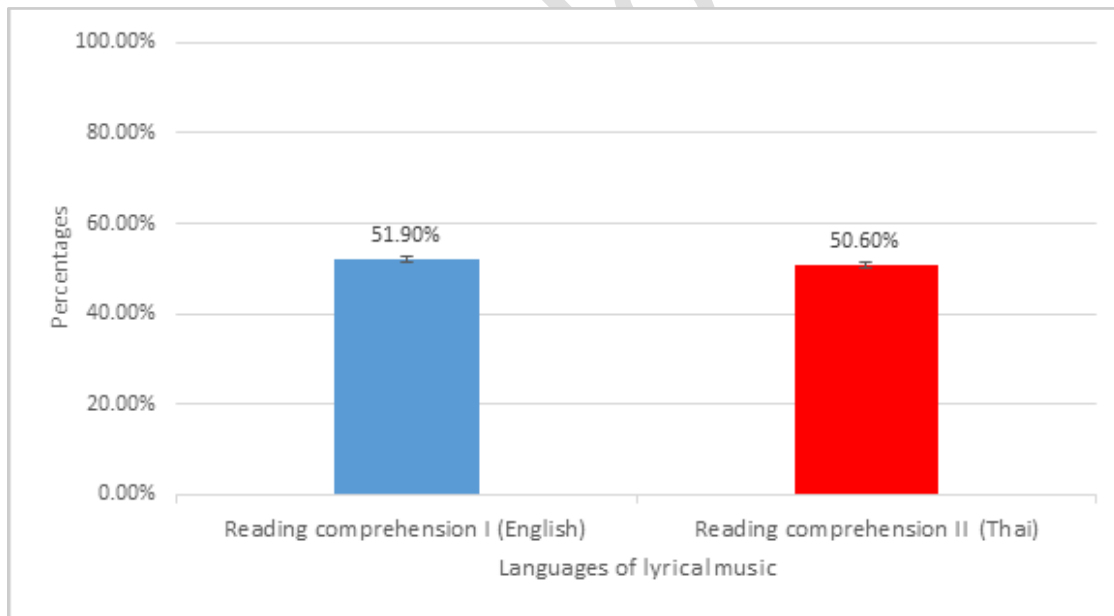


Figure 1 The total correctness of reading comprehension I and II

Figure 1 indicated that both English and Thai lyrical music distracted participants' reading comprehension since there were 51.90% (English lyrical music) and 50.60% (Thai lyrical music) of correctness. Moreover, the differences of the listening to English and Thai lyrical music seemed to impact the reading comprehension almost equally. This means that there was a slightly difference

between the results of reading comprehension I with English lyrical music condition and reading comprehension II with Thai lyrical music condition.

3.2 The comparative analysis between the correctness of detail items and main idea items

The percentages of the correctness of detail items and main idea items of reading comprehension I and II was shown in Figure 2.

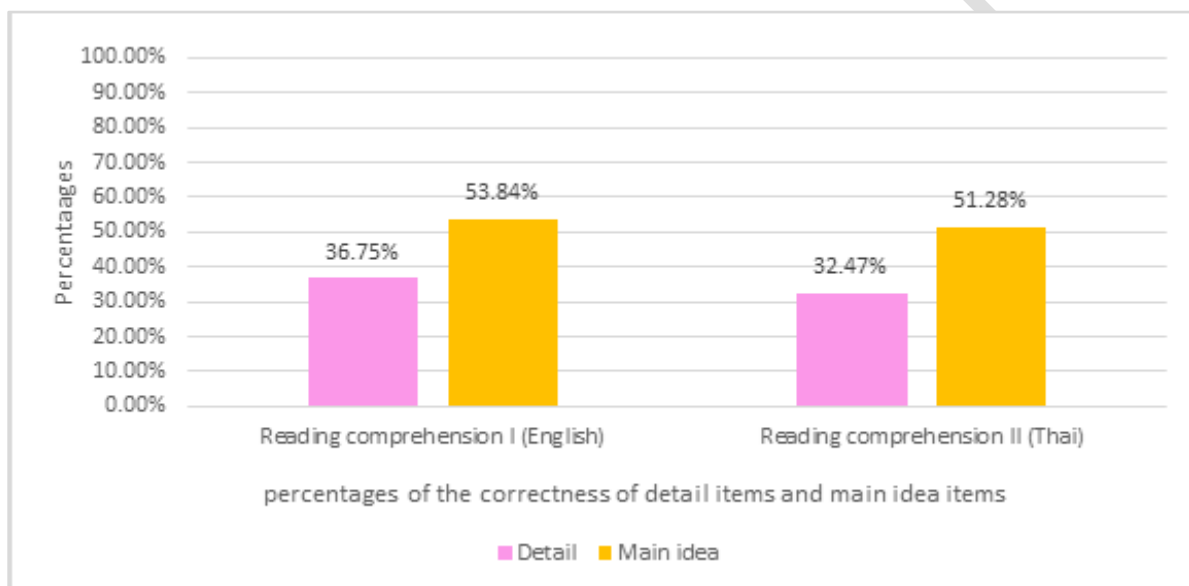


Figure 2 The comparative analysis between the percentage of the correctness of detail items and main idea items

Figure 2 showed that when comparing the detail questions part, the participants performed the greater scores of detail items while listening to English music as it was shown that the percentages of 36.75% of listening to English lyrical music condition was slightly higher than the percentages of 32.47% of listening to Thai lyrical music condition. With the main idea questions part, the result of listening to English lyrical music was slightly higher than listening to Thai lyrical music as well since the percentages of 53.84% was presented in English lyrical music condition and the percentages of 51.28% was presented in Thai lyrical music condition.

There were 36.75% (details questions) and 53.84% (main idea questions) of correctness in reading comprehension test I with English lyrical music condition while there were 32.47% (details

questions) and 51.28% (main idea questions) of correctness in reading comprehension test II with Thai lyrical music condition. It could be concluded that reading comprehension, especially in detail part was distracted by English and Thai lyrical music since the participants' performance in detail items was obviously lower than main idea items.

4. Conclusion and Discussion

Thirteen Thai students belonging to Mae Fah Luang University in the same level of proficiency were tested reading comprehension under two different conditions (English lyrical music and Thai lyrical music) within ten minutes. The answer to the research question was clear that is listening to non-native (The English Language) and native (Mother Tongue) lyrical music affects on reading comprehension. This means that listening to lyrical music distracts reading comprehension as indicated in the study by Anderson & Fuller (2010), Liapis, Giddens & Uhlenbrock (2008), Miller (2014), and Gillis (2010). Since participants might pay attention to lyrics in music rather than focusing on reading the passage, they were prone to not be able to catch all details in paragraph.

Additionally, the outcome was contrast to the hypothesis that reading comprehension might be more affected by Thai lyrical music than English lyrical music did. The outcome; on the contrary, indicated that there is no difference between listening to the songs in English lyrics (I see the light by Mandy Moore, Zachary Levi) and Thai lyrics (เห็นแสงประกาย โดย ชนนัยน์ สุขวัจน์) in terms of distracting participants' reading comprehension. This means that languages in music did not play an important role in reading comprehension. Obviously, one of the reasons that could best describe the result was that the proficiency of participant in this study was high in both English and Thai since the participants are fourth-year-MFU students who at least studied 109 credits of English courses; furthermore, all of them are Thai natives. Therefore, if readers were familiar with languages in music, the kind of languages might not be a barrier for reading while listening to music.

Moreover, it was clear that when listening to English lyrical music and listening to Thai lyrical music, participants received low percentage of correctness in detail questions, but high percentage in main idea questions. With the details questions, participants were required to pay very close

attention to every single piece of information in paragraph while participants encountering with main ideas questions were only required to cover the overall ideas of the text. This means that listening to music while reading distracted participants' reading comprehension since they could not catch some details in paragraph, but they could do better in understanding the overall ideas.

5. Recommendation

The outcome of the present study can be applied to reading skills—that is, the findings indicated that listening to music whether in what languages was more likely to distract learners' comprehension since participants have to put great effort into finding information while listening music. It seems reasonable, therefore, to advise teachers not to turn on the music while learners are reading.

To further the study, it is important that one more lyrical different language that is strange to participants be added since the participants were familiar with the languages (English and Thai) in music. The results therefore were almost the same.

Nevertheless, this study was done on a small population of participants over a short period of time. Reading comprehension of participants therefore may not be performed well enough in such a short exposure time. It is therefore recommended that more participants and a longer period of time are required.

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Appendix A

Conversation I

Question 1-11 are about the following conversation.

LISA: Ok, Greg, so I finally managed to read the article you mentioned - the one about the study on gender in physics.

GREG: About the study of college students done by Akira Miyake and his team? Yeah. I was interested that the researchers were actually a mix of psychologists and physics. That's an usual combination.

LISA: Yeah. I got a little confused at the first about which students the study was based on. They weren't actually majoring in physics - they were majoring in what's known as the STEM disciplines. That's science. Technology, engineering, and ...

GREG: ... and math. Yes, but they were all doing physics courses as part of their studies.

LISA: That's correct. So as I understood it, Miyake and co started from the fact that women are underrepresented in introductory physics courses at college, and also that on average, the women who do enrol on these courses perform more poorly than the men. No one really knows why this is the case.

GREG: Yeah. But what the researchers wanted to find out was basically what they could do about the relatively low level of women's result. But in order to find a solution they needed to find out more about the nature of problem.

LISA: Right - Now let's see if I can remember ... it was that in the physics class, the female students thought the male students all assumed that women weren't any good any physics ... was that it? And they thought that the men expected them to get poor results in their tests.

GREG: That's was the women thought, and that made them nervous, so they did get poor results. But actually they were wrong .. No one was making any assumptions about the female students at all.

LISA: Anyways, what Miyake's team did was quite simple - getting the students to do some writing before they went into the physics class. What did they call it?

GREG: Values-affirmation - they had to write an essay focusing on things that were significant to them, not particularly to do with the subject they were studying, but more general things like music, or people who mattered to them.

LISA: Right. So the idea of doing the writing is that this gets the students thinking in a positive way.

GREG: And putting these thoughts into words can relax them and help them overcome the psychological factors that lead to poor performance. Yeah. But what the researchers in the study hadn't expected was that this one activity raised the women's physics grades from the C to the B range.

LISA: A huge change. Pity it wasn't to an A, but still No, but it does suggest that the women were seriously underperforming beforehand, in comparison with the men.

GREG: Yes. Mind you , Miyake's article left out a lot of details. Like, did the students do the writing just once, or several times? And had they been told why they were doing the writing? That might have affected the results.

LISA: You mean, if they know the researchers thought it might help them improve, then they'd just try to fulfil that expectation?

GREG: Exactly.

GREG: So anyway, I thought for our project we could do a similar study, but investigate whether it really was the writing activity that had that result.

LISA: OK. So we could ask them to do a writing task about something completely different .. something else, like an oral task.

LISA: Or even, half do the same writing task as in the original research and half do a factual writing task. Then we'd see if it really is the topic that made the difference, or something else.

GREG: That's it. Good. So at our meeting with the supervisor on Monday we can tell him we've decided on our project. We should have our aims ready by then. I suppose we need to read the original study - the article's just a summary.

LISA: And there was another article I read, by Smolinsky. It was about her research on how women and men perform in mixed teams in class, compared with single-sex teams and on their own.

GREG: Let me guess ... the women were better at teamwork.

LISA: That's what I expected, but actually the men and the women got the same results whether they were working in teams or on their own. But I guess it's not that relevant to us.

GREG: What worries me anyway is how we're going to get everything done in the time.

LISA: We'll be OK now we know what we're going. Thought I'm not clear how we assess whether the students in our experiment actually make any progress or not

GREG: No. We may need some advice on that. The main things to make sure we have the right size sample, not too big or too small.

LISA: That shouldn't be difficult. Right, what do we need to do next? We could have a look at the timetable for the science classes ... or perhaps we should just make an appointment to see one of the science professors. That'd be better.

GREG: Great. And we could even get to observe one of the classes.

LISA: What for?

GREG: Well .. OK maybe let's just go with your idea. Right. Well...

Reading comprehension questions

1. The students in Akira Miyake's study were all majoring in
 - a. Physics.
 - b. Psychology or physics.
 - c. Science, technology, engineering or mathematics.
 - d. **None of above**
2. The aim of Miyake's study was to investigate
 - a. What kind of women choose to study physics
 - b. A way of improving women's performance in physics
 - c. Whether fewer women than men study physics at college.
 - d. **None of above**
3. The female physics students were wrong to believe that
 - a. The teachers marked them in an unfair way
 - b. The male students expected them to do badly
 - c. Their test results were lower than the male students'
 - d. **None of above**
4. Miyake's team asked the students to write about
 - a. What they enjoyed about studying physics
 - b. The successful experiences of the other people
 - c. Something that was important to them personally
 - d. **None of above**
5. What was the aim of the writing exercise done by the subject?
 - a. To reduce stress
 - b. To strengthen verbal ability
 - c. To encourage logical thinking
 - d. **None of above**

6. What surprised the researchers about the study?
 - a. How few students managed to get A grades
 - b. The positive impact it had on physics results for women
 - c. The difference between male and female performance
 - d. **None of above**
7. Greg and Lisa decide in their own project that they will compare the effects of____?
 - a. Two different writing tasks
 - b. A writing task with an oral task
 - c. Two different oral tasks
 - d. **None of above**
8. The main finding of Smollensky's research was that class teamwork activities
 - a. Were most effective when done by all-women groups
 - b. Had no effect on the performance of men or women
 - c. Improved the results of men more than of women
 - d. **None of above**
9. What will Lisa and Greg do next?
 - a. Talk to a professor
 - b. Observe a science class
 - c. Look at the science timetable
 - d. **None of above**
- 10 What is the main purpose of their conversation?
 - a. Find out pros and cons of numerous studies they have read
 - b. Have a discussion about their project
 - c. Make an appointment with their teachers
 - d. **None of above**

11 What should be the title of Lisa and Greg's research?

- a. The Factors Affecting Low Performances of Women in Physics
- b. The Strategies to Improve Performances in Physics
- c. The Gender Study in Physics
- d. **None of above**

12 What is the tone of the second part of their conversation?

- a. Objective
- b. Optimistic
- c. Apathetic
- d. **None of above**

_____/15 Marks

Appendix B

Conversation II

Question 1- 11 are about the following conversation.

HELEN: I've brought my notes on our Biology Field Trip to Rocky Bay, Colin, so we can work on our report on the research we did together.

COLIN: OK. I've got mine too. Let's look at the aims of the trip first.

HELEN: Right. What did you have?

COLIN: I just put something about getting experience of the different sorts of procedures used on a field trip. But we needed something about what causes different organisms to choose particular habitats.

HELEN: I agree. And something about finding out how to protect organisms in danger dying out?

COLIN: I our aims? But we weren't really looking at that.

HELEN: I suppose not. OK, now there's the list of equipment we all had to bring on the field trip. What did they tell us to bring a ruler for?

COLIN: It was something about measuring the slope of the shore, but of course we didn't need it because we were measuring wind direction, and we'd brought the compass for that

HELEN: But not the piece of string to hold up in the air! Didn't Mr Blake make a fuss about us leaving the behind.

COLIN: Yeah. He does go on. Anyway it was easy to get one from another of the students.

HELEN: Now, the next section's the procedure. I sent you the draft of that.

COLIN: Yeah. It was clear, but I don't think we need all these details of what time we left and that time we got back and how we divided up the different research tasks.

HELEN: OK. I'll look at that again.

COLIN: Then we have to describe our method of investigation in detail. So let's begin with how we measured wave speed. I was surprised how straightforward that was.

HELEN: I'd expected us to have some sort of high-tech device, not just stand there and count the number of waves per minute. Not very precise, but I suppose it was good enough. But the way we measured the amount of salt was interesting.

COLIN: in the water from the rock pools?

HELEN: Yeah, oh, I wanted to check the chemicals we used in the lab when we analysed those samples - was it potassium chromate and silver nitrate?

COLIN: That's right.

HELEN: OK. And we need the map of the seashore. You just left that to me. And I had to do it while the tide was low, well that was OK, but the place I started it from was down on the beach, then I realised I should have gone up higher to get better visibility, so I had to start all over again. But at least I'd got the squared paper or I'd have had problems drawing it all to scale.

COLIN: Yes, it looks good. We could get a map of the region off the internet and see if we need to make any changes.

HELEN: I had a look but I couldn't find anything. But you took some pictures, didn't you?

COLIN: Yeah. I'll email you them if you want.

HELEN: OK. I'll make my amendments using those, then I can scan it into our report. Great.

HELEN: Now when we get our findings I thought we could divide them up into the different zones we identified on the shore and the problems organisms face in each zone. So for the highest area....

COLIN: ... the splash zone?

HELEN: Yeah, we found mostly those tiny shellfish that have strong hard shells that act as protection.

COLIN: But not from other organisms that might eat them, predators?

HELEN: No, that's not the main danger for them. But the shells prevent them from drying out because they're in the open air for most of the time.

COLIN: Right. And since they're exposed, they need to be able to find some sort of shelter, or cover themselves up, so they don't get too hot. Then in the middle and lower zones, nearer the sea, we need to discuss the effects of wave action

HELEN: Yes, and how organisms develop structures to prevent themselves from being swept away, or even destroyed by being smashed against the rocks.

COLIN: I haven't done anything on the geological changes. I don't know what to put for that.

HELEN: No, we weren't concentrating on that. Maybe we need to find some websites.

COLIN: Good idea. I've got the lecture notes from Mr Blake's geology course, but they're too general. But we could ask him which books on our Reading List might be most helpful.

HELEN: Right. OK, now I did a draft of the section of source of possible error in our research, but I don't know if you agree. For example, the size of sample, and whether it's big enough to make any general conclusion from. But I thought actually we did have quite a big sample.

COLIN: We did. And our general method of observation seemed quite reliable. But we might not be all that accurate as far as the actual numbers go.

HELEN: Yeah, we might have missed some organisms - If they were hiding under a rock. For example. I wasn't sure about the way we described their habitats. I decided it was probably OK.

COLIN: Yeah, and the descriptions we gave of the smaller organism, they weren't very detailed, but they were adequate in this context. I'm not sure we identified all the species correctly though.

HELEN: OK, we'd better mention that. Now, how

Reading comprehension questions

1 What equipment did they forget to take on the Field trip?

- a. String
- b. A compass
- c. A ruler
- d. **None of above**

2 In Helen's procedure section, Colin suggests a change in

- a. The order in which information is given
- b. The way the information is divided up
- c. The amount of the information provided
- d. **None of above**

3 What do they say about the method they used to measure wave speed?

- a. It provided accurate results.
- b. It was simple to carry out.
- c. It required special equipment.
- d. **None of above**

4 What mistake did Helen make when first drawing the map?

- a. She choose the wrong sale.
- b. She stood in the wrong place.
- c. She did it at the wrong time.
- d. **None of above**

6 What do they decide to do next with their map?

- a. Scan it onto a computer
- b. Check it using photographs
- c. Ad information from the internet
- d. **None of above**

7 Which problem affecting organisms in the splash zone are mentioned ?

- a. high temperatures
- b. Strong winds
- c. Lack of food
- d. **None of above**

8 Why did they have to bring a ruler for their field trip?

- a. To measure the size of the shellfish
- b. To measure the slope of the shore
- c. To measure the size of organism
- d. **None of above**

9 What are the chemicals they use in the lab to analyse the samples?

- a. Silver nitrate and Potassium
- b. Sodium bicarbonate and Carbonic acid
- c. Glucose and Carbon
- d. **None of above**

10 What is the main purpose of their discussion?

- a. Share experience of having field trip
- b. Have a discussion about the report of their research
- c. Inform their friends of results from the field trip
- d. **None of above**

11 Which part is not included in their report?

- a. Factors affecting where organisms live
- b. Technique for classifying different organisms
- c. Procedure of investigation
- d. **None of above**

12 What is the tone of their conversation?

- a. Objective
- b. Pessimistic
- c. Apathetic
- d. None of above

_____/15 Marks

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